Monitoring, Verification and Evaluation Report for Refrigerators

MV&E Refrigerators Report - Lesotho

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PEGASYS CHANGING LIVES CHANGING WORLDS

TABLE OF CONTENTS

1 4

2 6

3 11

3.1 11

3.2 12

3.3 14

4 16

5 19

5.1 19

6 28

7 29

LIST OF FIGURES

Figure 1. Draft Lesotho Energy Label for Refrigerators 15

LIST OF TABLES

Table 1. Entities and roles in development of MV&E in Lesotho 12
Table 2. Lesotho MEPS for refrigerators 14
Table 3. Actions, responsibilities and timelines 26
Table 4. Budget Estimate for the implementation of the MV&E in Lesotho 27

ABBREVIATIONS

AfDB	African Development Bank
DoE	Department of Energy
EU	European Union
GCF	Green Climate Fund
GWP	Global Warming Potential
HEPS	Higher Energy Performance Standard
IMF	International Monetary Fund
LEC	Lesotho Electricity Company
LED	Light emitting diode
LNDC	Lesotho National Development Corporation
LSI	Lesotho Standards Institute
LSL	Lesotho Loti
MDG	Millennium Development Goals
MEPS	Minimum Energy Performance Standard
MV&E	Monitoring, Verification and Enforcement
ODS	Ozone Depleting Substances
PWG	Policy Working Group
SADC	Southern African Development Community
TBD	To Be Determined
UA	Units of Account
U4E	United for Efficiency

1 Introduction

The 'Leapfrogging to Energy Efficient Appliances and Equipment in Lesotho (Refrigerators and Distribution Transformers)' project is delivered by the UN Climate Technology Centre and Network with funding from the Green Climate Fund (GCF) and being implemented under the guidance of the government of the Kingdom of Lesotho (Lesotho). The project is also being implemented simultaneously within 7 other countries of the Southern African Development Community (SADC) region, namely Botswana, Zimbabwe, Namibia, Malawi, eSwatini, Zambia and Tanzania. Furthermore, a related regional project is being implemented simultaneously. The regional project is implemented throughout the SADC region and undertakes the development of the regional standard for energy efficiency of refrigerators. It also outlines guidelines for a regional energy label with the aim of standardising and aligning the Minimum Energy Performance Requirements (MEPS) for refrigerators across the region. Lesotho is one of the few countries in the world that is completely encircled by another country. Lesotho is completely contained within the borders of South Africa. Thus, Lesotho has no access to the coast/sea. Therefore, it is heavily reliant on trade with South Africa be it for equipment or for commodities such as oil, petrol and even electricity. The electrification rate in Lesotho is currently under 45% [1] but it is on the increase. The government of Lesotho has embarked on an electrification campaign, which also targets rural areas. The electrification is also expected to drive economic growth in the country. Currently however, Lesotho imports over 60% of its electricity from South Africa [2]. For this reason, the average price of electricity (generation + import) in Lesotho is quite high and any losses are hence expensive. Refrigeration appliances (and distribution transformers), in particular household refrigerators, are appliances that are constantly operating. As such they always consume energy (24 hours per day, 365 days per year). Therefore, energy efficiency improvements in these appliances have a continuous impact on energy efficiency improvements for Lesotho.

The electrification campaign listed above and the drive towards energy efficiency align with the Lesotho Energy Policy 2015-2025. The vision of the Lesotho Energy Policy is to ensure that energy is universally accessible and affordable to all in a sustainable manner. Furthermore, the aim is to have a minimum negative impact on the environment in this process [3]. The two main objectives of the energy policy related to energy efficiency are:

1. To minimise losses in energy processes

2. To reduce energy imports in meeting demand

Through the development and the subsequent implementation of this project some of the objectives of the energy policy can thus be met. The aim of the project was to focus on distribution transformers and household refrigeration appliances and attempt to establish a framework in order to improve the energy efficiency of these appliances. This was done through the establishment of national standards for both refrigerators and distribution transformers and development of Minimum Energy Performance Standards (MEPS), Higher Energy Performance Standards (HEPS) as well as an energy labelling scheme for refrigerators. In order to successfully

implement the national standard, which includes the MEPS and HEPS and the labelling scheme for refrigerators, a Monitoring, Verification and Enforcement (MV&E) plan has been developed.

During the project engagements were held with all of the key stakeholders within the country to create a system through which the necessary legislation can be developed related to the implementation of the MEPS and also to create a national implementation plan that will both enable the implementation of the MEPS but also create a framework within Lesotho for future development of related standards and legislation. Furthermore, the project investigated possible financing mechanisms available to assist implementation. The following were the key components of the project:

1. Development of the Lesotho National Standard on energy efficiency in refrigerators (including MEPS and HEPS)
2. Development of the Lesotho Energy Label
3. Development of the consumer awareness campaign
4. Development of the recommendations related to the financial supporting mechanisms
5. Development of the MV&E plan
6. Development of the National Policy Roadmap (NPR)

This report outlines the MV&E plan and its various components. These include the institutional and regulatory framework within Lesotho important for the implementation of the MV&E plan as well as the actual MV&E plan components, their importance and an outline of implementation. Furthermore, this report calculates an implementation budget for the MV&E plan.

2 Monitoring, Verification and Enforcement

There are therefore 3 aspects to the MV&E plan which are equally important with their own role within the framework. These are monitoring, verification and enforcement. Each of these is described in more detail in this section.

Monitoring –The monitoring that forms part of the MV&E plan relates to the checking of the energy efficiency of refrigerators. This includes the monitoring of the number of refrigerators that are compliant to the MEPS that have been established and that have the compliant label and of course the number of non-compliant refrigerators and the reasons for non-compliance or rather the type of non-compliance.

Verification – this is the process of checking whether the product in question, a refrigerator in this case, performs as it is required by the standard and the regulation. This includes several processes within the overall procedure. The first is the testing of the refrigerators at the laboratories. Secondly, certain manufacturers may carry product certification for their refrigerator range and this would be another verification process. Finally, the processes of verifying the compliance to the regulations at the border and during market surveillance are also a part of such a process.

Enforcement – this is the process of ensuring that there is compliance with the regulations that will be developed and that there are actions taken against those that are non-compliant. Effectively, it is important to set up the rules of operations and to set up structures for these rules to be implemented but it is equally critical for the rules to be enforced and for the consequences of not complying with those rules to also be enforced.

Furthermore, the standards developed as well as the energy label and the resulting regulation are critical components that are important to the MV&E plan as they provide the framework that outlines what should be monitored and verified and how it should be enforced..

Standards - Standards are effectively a formula that can be used to describe the best way of doing something or making something. Standards are compiled through engagements with industry experts and through technical committees where the issues related to the standard development are discussed at length using related multi-disciplinary institutional knowledge [4].

Quoting ISO [4]: ”Standards are the distilled wisdom of people with expertise in their subject matter and who know the needs of the organizations they represent – people such as manufacturers, sellers, buyers, customers, trade associations, users or regulators.”

Labelling - Energy labels are a key component of an energy efficiency programme. They are a visual indicator of the energy performance of the appliance. A well designed energy label provides a clear and concise visual representation of energy efficiency and provides information on the annual energy consumption of the appliance when used a pre-defined settings. The energy label enables the consumer to choose a more efficient product

through simple means [5]. Simultaneously, if the energy label is well known to the consumers and impacts their purchasing decision the energy label also drives the manufacturers to improved efficiency through market competition.

Regulation - As indicated standards alone are merely guidelines or a formula to obtaining the required product or service. However, in order to implement them and make them mandatory often regulation is required. Regulation is defined as a rule prescribed by an authority [6]. Therefore, the standard is then often referred to by the regulation and is the "rule" part of the definition. The respective regulator is then the authority that is prescribing the regulation and is responsible for enforcing it. Regulation is often the most effective way in enforcing important standards that have a great impact on society and the environment.

In order to be able to effectively implement the MEPS and the labelling a Product Registration System (PRS) is highly useful.

Product Registration System (PRS)

The PRS is one of the terms used to refer to a system which enables regulators to enforce the regulations on products entering the country and those manufactured in the country. Lesotho does not manufacture refrigerators so in Lesotho this will refer only to imported products at present. The PRS acts as a first port for compliance when products aim to enter the country. It is a system whereby the specific product is registered and the information required for compliance with the relevant regulation can be submitted. A system such as this allows the products to be reviewed prior to arrival at the port and for a permit allowing imports to be issued to the importer. This reduces the amount of work that is required to be performed at the border. A system such as this, if effectively set up, can also serve as a good database of the imports of the specific product, the types of appliances that are being imported and trends related to non-compliant applicants, etc.

Objectives of the MV&E system

A well-established MV&E system has several objectives to fulfil. It is the primary system for compliance with the MEPS. Of course the main objective of the MV&E system is to enable compliance with the MEPS and through this process to improve the energy efficiency of the country. Through the improvement of energy efficiency there are other benefits such as the reduction of electricity costs for households, reduction of electricity imports for Lesotho, reduction of greenhouse gases in the atmosphere resulting from reduction in electricity generation from fossil fuels (as is primarily the case in Lesotho). Some of the key objectives are:

- Ensure that Lesotho meets the energy efficiency targets
- Drive away cheap alternative refrigerators (that are less efficient)
- Provide a measure of success for the various stakeholders – allowing a re-assessment of approach at various intervals

- To provide an avenue through which products can comply with the regulation
- Success of this project can be the launch pad for other energy efficient projects and can open funding for such
- Successful policies, such as the PRS and the labelling scheme can be used as an example/template and implemented in other appliances

Having an effective MV&E plan shows the level of success of implementation of the system and the level of compliance of the importers and manufacturers. In turn having a measured level of success is an enabler of the country being able to portray its effectiveness and to use such a similar system in other commodities and appliances that it chooses to target in the next steps towards improved energy efficiency.

Requirements for the MV&E system

In order for the MV&E system to be effective it requires certain general components that are common and applicable to most situations/projects. They would certainly be applicable to the refrigeration MV&E system required for this particular project and the MEPS and labelling scheme. Each of the requirements is explained in a more detail below:

1. The PRS system

The product registration system is a very useful tool for the establishment of an effective MV&E system. The PRS allows importers to register their products and for the products to be reviewed by a regulatory authority prior to arrival at the port.

2. Ability to perform/review conformity assessment

The PRS allows for applications to be made as per the requirements of the relevant MEPS/national standards/regulation. It is therefore key for the country to have the ability to review the conformity assessment aspect of the application (test reports and/or certification). For the review aspect, experts are required with experience in the actual testing standards as well as experience in conformity assessment in order to understand accreditation, types of certification, etc. In terms of self-testing (country testing) the test laboratory is a requirement. This can either be its own laboratory or a relationship with a laboratory within the region that can be used for testing products from the market during surveillance or even at application.

3. Market surveillance

Market surveillance is one of the key aspects of an MV&E scheme. The products that enter the market, especially those that are sold to the public, such as refrigerators, require constant monitoring. The monitoring

is most effective at sales points (e.g. wholesalers, appliance resellers, etc.). The personnel performing the market surveillance require training in the permits, the labelling and the standard and relevant regulation.

4. Governmental support

The MV&E scheme often requires various governmental entities to be involved and to cooperate on various aspects of its implementation. This could be the collaboration between the standards institute and the regulatory authority in reviewing applications of the PRS, or the market surveillance that may be conducted by the revenue authority and the regulator. Additionally, the PRS applications and permits are required by the revenue authorities at the ports. Therefore, governmental integration and communication is essential. Furthermore, since regulation is required in order to have an effective MV&E plan to implement, governmental support for the driving of the development of such a regulation is necessary.

5. Financial support

Implementation of the MV&E programme requires certain finances. The financial estimates required for the implementation of this project are presented in the remainder of this document.

6. Alignment with the regional movement

In this particular project there is a regional drive towards energy efficiency and this is underpinned by the regional project. This aids the implementation of the MV&E system as certain aspects of the system, for example the PRS process and the related software system, can be shared to reduce costs. Furthermore, it allows ease of trade within the region and entices more international suppliers as compliance is only required as a once-off for the entire region.

7. Education of the users of the PRS

The education of the importers, manufacturers and wholesalers of the PRS and the application process in particular is critical. Furthermore, it is important that the wholesalers in particular understand the market surveillance process. Buy in from the importers, manufacturers and wholesalers makes the process much smoother. The majority of the compliant importers and manufactures are usually keen to participate in an MV&E scheme as it helps them in their battle against cheap, non-efficient imports.

8. Feasible/attainable and measurable goals

It is also critical that the goals in the evaluation aspects are measurable. An evaluation and monitoring component requires surveillance of the key components of the project in order to understand whether the MV&E system is successful or whether it requires adaptations. For this to be possible it is critical that the goals that are set are reasonable. They need to be attainable but tough and also need to be measurable. They thus need to be specific enough so that they can be clearly measured through a pre-defined method (e.g. survey of households). The ability to prove that the campaign is successful is a strong marketing tool and has the ability to further drive momentum within the public. Additionally, it shows that the implementation was well planned and executed and that the system works, which can provide further funding for other, similar projects in energy

efficiency. If the results are less than satisfactory and goals are not met the accurate evaluation of performance allows for specific targeted improvements to be made, which are most effective.

Non-compliance

Even though the compliance methodology is set up through the various policies and regulation, it is also key to the success of the MEPS and labelling, and hence the overall impact on energy savings, that non-compliance with the processes is dealt with. Non-compliance can occur in different forms. It can be unintentional through the loss of the label for example at the store and hence for it not to be available at the refrigerator, or for the labels to be swapped between refrigerators. It can also be intentional, for example the printing of a new label with a higher efficiency rating by the store in order to try and sell their product as more energy efficient.

The regulation that is related to the MEPS needs to enable implementation of penalties for non-compliance. It also needs to establish non-compliance penalties. These are often risk based approaches and severity of penalties depending on intention of non-compliance, the impact it has and the repeatability. For example an unintentional swapping or loss of energy labels at the store can lead to a warning. Intentional forging of the label can lead to monetary penalties and repeat offences of the same nature can lead to suspension of the trading license combined with monetary penalties.

3 Institutional and Regulatory Framework

3.1 INSTITUTIONAL FRAMEWORK FOR REFRIGERATORS IN LESOTHO

In order to effectively implement the MV&E system related to refrigerators it is important to understand the current institutional framework of the country. This is important as it outlines the best way to understand the various roles and responsibilities of departments and other governmental entities that are involved in the refrigeration aspect of the project. They are important to understand the following:

- Standardisation processes within the country. This includes the framework for standard development and standard maintenance.
- Regulatory framework. The effective implementation of MEPS usually requires accompanying regulation. Importantly, this regulation needs to be implementable once developed.

Dedicated financing is often a barrier to the implementation of energy efficiency policies and programmes. At the moment there are no dedicated financing mechanisms in Lesotho for the funding of such policies and programmes. This particular project has been funded by the CTCN and is assisting in the establishment of structures that will enable support for such policies to be implemented. A number of institutional stakeholders exist within Lesotho that are key to the successful development and implementation of this project. Lesotho possesses a regulator in this environment namely the Lesotho Water and Electricity Authority (LEWA). Additionally, the Lesotho Standards Institution (LSI) is newly formed. This is key as the organisation has formalised structures for the development of the national standards.

The other key institutions and/or ministries related to this project are: Ministry of Energy and Meteorology, Ministry of Communication and Science, the Lesotho Electricity Company, the newly formed Lesotho Electricity Generation Company, the Lesotho Revenue Authority, and the Lesotho Central Bank.

In Table 1 below is a list of the entities listed above and their importance/role in the development and implementation of MEPS.

Table 1. Entities and roles in development of MV&E in Lesotho

Organisation	Role
Ministry of Energy and Meteorology	Driver of the MEPS development and implementation. Formation of energy related initiatives. They will drive he development of the regulations related to MEPS and labelling.
Ministry of Communications and Science	The support ministry to the Ministry of Energy in this project. Can facilitate governmental support for legislation and implementation support
Lesotho Electricity and Water Authority	LEWA is a regulator in the electrical environment. LEWA is thus responsible for the implementation of the regulation. This would include the assessment of the PRS applications and the monitoring and surveillance activities.
Lesotho Standards Institution	The LSI is responsible for the development and the administration of the national standards, including the new national standards on refrigerators and distribution transformers.
Lesotho Electricity Company	The main buyer and user of distribution transformers. Also the importer and seller of electricity and as such a key to the implementation of the project and one of the project's biggest beneficiaries
Lesotho Electricity Generation company	Newly formed organisation. Responsible for new electricity generation within the country.
Lesotho Central Bank	Responsible for the governance of the financial sector and would be able to support initiatives that finance the implementation of the project from a regulatory perspective

There are also other important stakeholders that are going to be involved in the implementation of the MEPS, the energy label and the MV&E plan overall, or will have an influence on the project. These include:

- The Lesotho Industrial Development Corporation (owners of distribution transformers)
- The University of Lesotho (in particular the Energy Research Centre)
- The retailers (both local and large international organisations)
- Repair centres and technicians
- Financial institutions (specifically the banks as possible lenders supporting the implementation of energy efficient appliances)

3.2 POLICY FRAMEWORK FOR REFRIGERATORS IN LESOTHO

In recent times Lesotho has welcomed energy efficiency projects. This is evident through its participation in the Energy Efficient Lighting and Appliances project in the SADC region. Additionally, the Ozone Unit at the Ministry of Energy and Meteorology of Lesotho has undertaken several tasks as part of its commitment to the Montreal Protocol and the ratification of the Kigali Amendment. Lesotho is also a part of the United Nations Environment

Programme that is attempting to reduce the amount of PCBs in use in the country and region. Additionally, the government of Lesotho has issued it National Climate Change Policy and has understood the need for increased energy efficiency and the importance of mitigating against climate change. In Lesotho there is a legislative, regulatory and policy framework that encompasses energy efficiency amongst other energy and electrical areas of operation. Some of the major ones and ones that are most relevant to this project and MV&E implementation are described in more detail below.

The Lesotho Energy Policy 2015 - 2025. This policy has several aims, including mass electrification of the country and encourages an increase of renewable energies into the generation mix [3]. This policy also looks at the development of the Renewable Energy Feed-In Tariff. Furthermore, this policy also promotes energy efficiency in relation to electricity supply and is thus an important pillar of policy support for the development and maintenance of MEPS for distribution transformers and refrigerators.

One of the outcomes of the energy policy is the rural electrification drive. The LEC and the Ministry of Energy are heading this project. The project is currently being rolled out and remote villages are supplied either with grid extensions or through off-grid or micro-grid solutions. In such instances energy efficiency of distribution transformers becomes extremely important and this is a point that is understood by the Ministry of Energy and the LEC.

The Lesotho National Climate Change Policy. This policy looks to ensure sustainable development within Lesotho in line with its National Vision 2020 plans and the National Strategic Development Plan, whilst adhering to best practices in order to tackle climate change. Energy efficiency, which results in a reduction in energy losses therefore directly translates into this vision and supports such a policy. Some of the acts that govern the formation and operation of the key state owned entities related to the operation and supply of electricity are:

- Lesotho Electricity Authority of Act (2002 and subsequent amendments). This act is key to the electrical industry in Lesotho. It paved the way for the formation of the Lesotho Water and Electricity Authority. This is the regulator that oversees the electrical industry and supply of electricity. It also sets the electricity tariffs.
- Lesotho Companies Act of 1967. This act in combination with the electricity act paved the way for the formation of the LEC. This in turn allowed a far greater access to electricity to Lesotho and enabled economic growth.
- Lesotho Environment Act of 2008. This act makes provision for the protection and management of the environment and conservation and sustainable utilisation of natural resources of Lesotho.

3.3 MINIMUM ENERGY PERFORMANCE STANDARD AND THE ENERGY LABEL

As part of this project and through the efforts of the various national stakeholders involved a Lesotho MEPS and energy label have been developed. The MEPS forms part of the national standard for refrigerators. The national standard is undergoing finalisation of the public commenting process and will be published by the Lesotho Standards Institute thereafter. The energy label has been drafted through a consultative process with the PWG members, and is aligned with the current guidelines of the draft regional label. The MEPS are presented in Table 2 below.

Table 2. Lesotho MEPS for refrigerators

Product Category	**R (2023)**	**R (2026)**
Refrigerator	1.00	1.25
Refrigerator/freezer	1.00	1.25
Freezer	1.00	1.25

The draft energy label is presented in Figure 1 below.

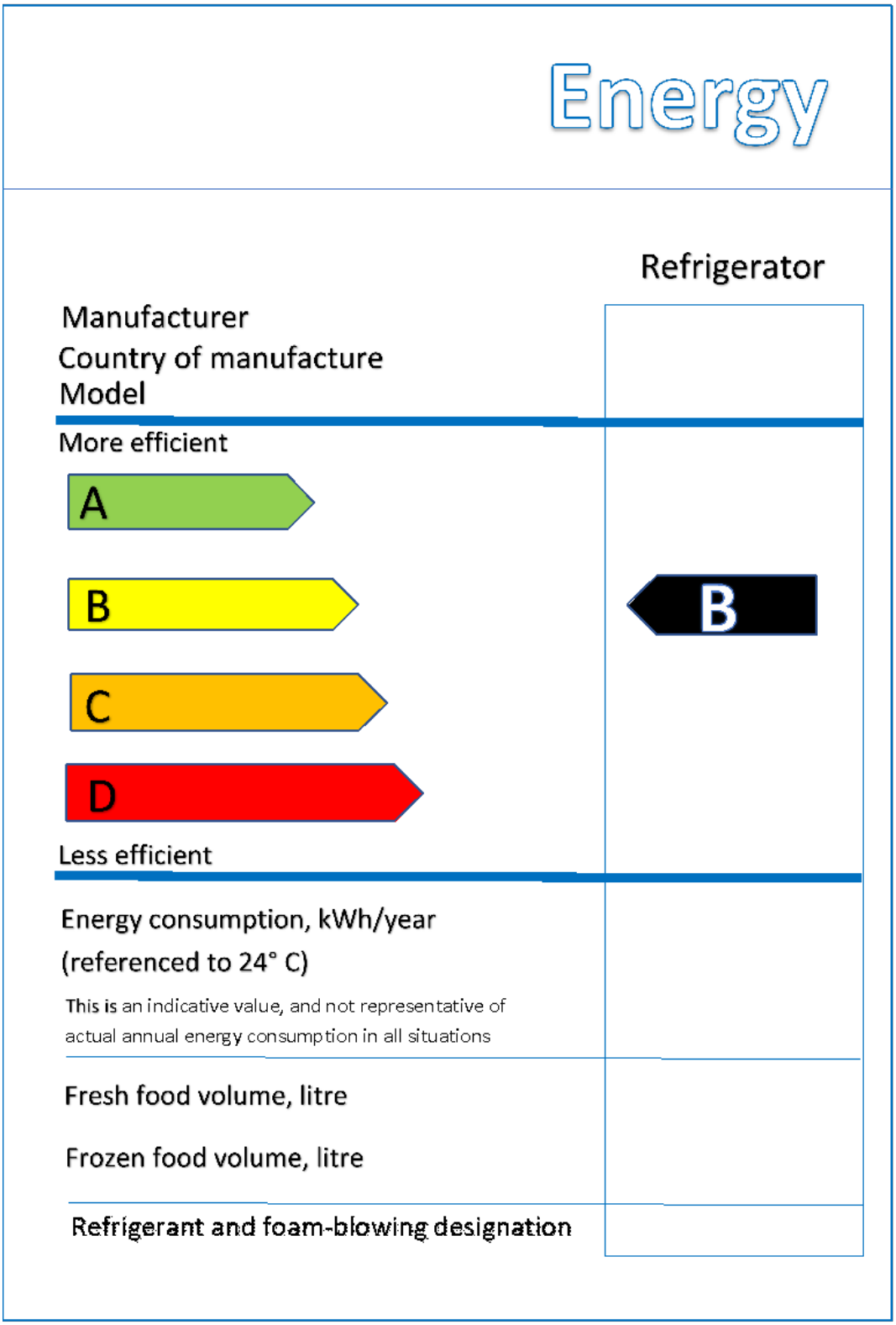

Figure 1. Draft Lesotho Energy Label for Refrigerators

4 Requirements for successful implementation in Lesotho

In section 2 a number of elements required for a successful general MV&E plan implementation were listed. In order for the MV&E plan to be implemented successfully in Lesotho a number of these elements listed above are key and require particular attention. They are therefore explained in more detail below.

1. The setup of the software system to manage the PRS

The software system needs to be developed so that it can handle the application process. Thereafter the applications should be directed to the governmental department for processing. The processing includes verification of conformance and verification of the remaining administrative aspects of the application (e.g. contact details, name and make of refrigerator, etc.). This process will be conducted by LEWA with assistance related to confirming authenticity of reports supported by the LSI. Therefore, the system needs to be such that it allows access to various pre-defined personnel from different departments and so that information can be shared amongst departments. A software system already exists within the Lesotho governmental agencies that will be updated to incorporate the requirements of the application and review processes of the PRS. This system requires flexibility as some of the fields may require adaptation after implementation as lessons are learnt. This adaptation of the system should be simple to do, otherwise it may require outsourcing to experts and will add costs to the project.

2. The training of internal personnel at the RSL, LSI and LEWA and other departments that undertake various responsibilities within the MV&E scheme

The training programmes have been developed as part of the implementation of the Project. The training referred to in this section specifically relates to the capability of the RSL personnel to assess compliance of the poduct at the border (border inspections). Specific training has been presented to the RSL personnel as part of this project and the training will be further implemented within the RSL and to their personnel at the various border posts performing the inspections. The training has been aligned with the application and approval process described in this MV&E plan.

The other aspect of the training is to review the application as part of the PRS. The review of the application is effectively the verification of compliance and this aspect has been trained in the train the trainer programmes as part of the project. The training will then be implemented further within the RSL. Furthermore, the LSI will also assist in this regard as they are a conformity assessment specialist body and as such the training will also be performed within their organisation. LEWA will be implementing the application review process and the

training will also be implemented throughout its organisation to the dedicated inspectors that will be performing the PRS application review and market surveillance processes.

3. The interdepartmental communication, information and knowledge sharing

As can be seen from all of the activities that have been outlined in the MV&E plan it is critical for the departments and state owned entities to share information and knowledge in order to implement the MV&E plan effectively. For example the application platform needs to be shared between the LSI, RSL and LEWA. The permit, once approved by LEWA also needs to be shared with the RSL. The results of the market surveillance and the results of applications need to be shared by LEWA with the DoE and possibly other departments responsible for trade, etc. Therefore, a large amount of information sharing is required and openness within the governmental entities is critical.

4. Governmental support and drive to establish the required regulation

The regulation development process is not necessarily part of the MV&E plan. The MV&E plan however relies on regulation, which makes the MEPS and the labelling mandatory within Lesotho. Therefore it is a critical step. The DoE will drive this process and have a recent success of a regulation developed for micro-grids in relation to rural electrification, which was also part of the Energy Policy. The DoE will thus pursue the development of the regulation related to energy efficiency through the same channels as it also aligns with the same Lesotho National Energy Policy.

5. Overall budget and implementation

In order to enable the implementation of the outlines MV&E system a budget will have to be financed as related to execution. The budget is outlined in Table 4 and amounts to approximately LSL 18 million (approximately $1 million). From the activities within the budget it is evident not all of the finance is required to be obtained at once and that some of the activities can start immediately. The training for example will be budgeted for by the individual departments or state owned organisations. The important first steps are the training and the implementation of the software system to enable the PRS. The software already exists and only requires an upgrade rather than the implementation of a new system. Equally important is the budget for the market surveillance system. The requirement is for personnel to carry out the surveillance inspections and for them to be trained prior to the start of the process. Furthermore, if a decision is made to perform certain testing of refrigerators sampled from the stores then the cost of the purchase of that refrigerator and the cost of testing should be catered for. The majority of the costs will therefore be required for the processing of the PRS and the related market surveillance. These costs can be financed through application fees and levies on products. During the discussions within the PWG the initial feelings were that the application fee will be charged for the PRS but that levies on imports will not be charged.

This is to be reviewed through the implementation stages. The initial estimate is that there is a requirement for 5 additional persons (3 with LEWA, 1 with the LSI and 1 with the RSL) in order to implement the PRS and the market surveillance. The number of personnel required is likely to double once the programme is rolled out completely. It is estimated that LSL 8 million will be required for the annual implementation (beyond the initial setup budget) of the PRS and thus a levy for applicants should be considered in the future. This levy can be a set fee per number of units imported and the South African model of levies imposed by the National Regulator for Compulsory Specifications can be considered.

5 Proposed MV&E plan for Lesotho

In order for the future Lesotho National Standard and energy label to be effective, a well-planned, supported, systematic MV&E framework is required. In Lesotho regulation will be developed that will make compliance with the MEPS and the energy labelling mandatory. This will create a framework for compliance and ensure that all players in the market are subjected to the same requirements. It will also provide mechanisms for market surveillance and for handling non-compliances. Through having such structures, it is likely that there will be substantial levels of compliance in the market. Having such a system is often beneficial for those market players that are looking to comply and that aim to sell energy efficient products. It is therefore beneficial to such companies and as long as the MV&E structures are implemented it is primarily a negative to the non-compliant companies and those that are looking to bring in inefficient, cheap alternatives. For such a reason the market becomes partly self-governing in such a setup as it is suited to compliance. Once such a system is established it also lends itself to continuous improvement. The MEPS in Lesotho are set to increase in 2026, as are those of the regional standard. Furthermore, through public awareness (the implementation of which is part of the MV&E plan) the average consumer will demand higher efficiencies and market forces dictate that these will come as a result of manufacturer's improvements and will eventually lead to increased efficiencies and quality of refrigerator at reduced prices.

Therefore, the next sections outline the final recommendations for the MV&E plan and from the discussions within the Policy Working Group (PWG) and with the Lesotho National Stakeholders an action plan has been developed, with responsibilities for implementation assigned to various entities. Additionally, a preliminary budget for implementation for the next 3 year period has been developed and can be found in the final section of this chapter. The main component of the MV&E plan have been outlined in the previous section and the specific details related to implementation in Lesotho are described in more detail below

5.1 COMPLIANCE PROCESS

In order for the implementation of the project to be successful there are several steps that are required. Once the regulation is passed the compliance process will need to be undertaken by all importers, manufacturers and wholesalers of refrigerators in Lesotho. This section outlines the process that was chosen for Lesotho. It must be stressed that this process is not currently implemented in Lesotho and that this is the proposed process, discussed during the PWG meetings that is going to be implemented in the near future. The breakdown of the steps to be undertaken are as follows:

- Application (effectively the application is part of the PRS)
- Application review (this is the review of compliance)

- Issue of permit (or rejection of application)
- Submission of permit and label by manufacturer at the port
- Checking of permit against the goods at the port
- Market surveillance of goods at the sales points for compliance (label and permit)
- Dealing with non-compliances

The breakdown of each of the processes above is as follows:

5.1.1 APPLICATION

The application is performed by either the manufacturer or the importer of the refrigerators into Lesotho. As stated, there are currently no manufacturers in Lesotho but if they do open they will be required to undertake the same process and would fall under the same regulation. The application is performed on the specific Lesotho governmental internal platform. This is an existing platform in Lesotho which allows access to the information to be shared between various departments. Lesotho does have the PRS that is currently used for other commodities, primarily food and water. They have a system whereby applications are made and the information is shared between the regulator (LEWA) and the RSL. The RSL can then retrieve the application information through this online information sharing platform and have it available at the ports. The RSL therefore has the ability to retrieve the information at the ports and use it to process its border controls. The system however requires modification. The current system is such that only LEWA sees the application and then only after approval is the information visible to the RSL. For this application purpose the application would be sent to LEWA. The information would also be visible to the Department of Energy (in case there is a need to oversee the process in the future) and to the RSL. The information that the manufacturer/importer needs to supply is the basic information related to their company (name, contact details, address) and information related to the refrigerator (model, type, volumes, etc). In addition, the applicant needs to supply the proof of compliance (test report or certification and a test report) for the refrigerator in question as well as a sample of the label that will be used. All of these documents can be submitted electronically on the platform. The review would be performed as below and the information for the review will also be available to the LSI for assistance with the proof of compliance.

5.1.2 APPLICATION REVIEW

The LEWA assessor then receives the application and checks the following:

- That the test report and/or certification is from an accredited facility

- Checks the energy consumption on the test report and compares it to the energy consumption on the label
- Checks the R value as per the outcome of the test report and compares it to the level (bar) of energy efficiency on the label
- Checks that all of the information related to the refrigerator is correctly listed on the label (e.g. model, type, volumes, etc.)
- Checks that the energy label contains all of the required information (consumption, model, manufacturer, volumes, etc.)

The LEWA assessors would be trained in the assessment process. The LEWA representatives were involved in the workshops and the training in this project and would be able to further disseminate the training within their organisation.

5.1.3 ISSUE OF PERMIT

If all of the information and all of the checks listed above are positive, the assessor then issues the permit to the applicant. If not a rejection (with reasons) is sent to the applicant. The applicant is then allowed to resolve the issues and re-apply. The successful applicant then has the permit that they would need to submit to the RSL prior to the arrival of the refrigerators at the border. The successful permit is also loaded onto the system by the LEWA official and the RSL now also has access to this permit on the system (and can access it remotely/electronically).

5.1.4 SUBMISSION OF PERMIT AND LABEL

The applicant (manufacturer or importer) is now in possession of a permit. The importer usually submits documentation to the RSL prior to the shipment arriving at the port. These are clearance documents, etc. With these documents they are also required to submit the permit received and the label design. They are also informed that it is good practice for the transporter to also have copies of these documents with them when arriving at the border post. Therefore, the permit and the label will be on the system and the transporter will also have the documentation with them when arriving at the border post for inspection.

5.1.5 INSPECTION AT THE BORDER

The RSL officials inspecting the shipment would have a task of verifying the information against the physical evidence. The aim of the process described above was to enable the RSL inspectors to be able to carry out this task with efficiency and simplicity. They therefore do not need to check the test reports or deal with technical matters related to energy efficiency of refrigerators. They would receive the permit from the importer (and can also verify this permit against the one on the system if they decide to). They need to check the following:

- That the physical refrigerator model and manufacturer match the one on the permit and the one on the label
- That the permit is still valid and that it is compliant (that the R value on the permit is above 1.00 – MEPS has been reached)
- That the R value on the permit matched the HEPS level on the label (e.g. if the permit indicates an R value of 1.3 that they confirm that the label indicates a C class refrigerator)
- That the rest of the information on the label matches the permit and is on the actual label (e.g. volumes, energy consumption)

If the above checks are successful the shipment is allowed to proceed. If they are not the shipment is detained until either the error is rectified (if it is a small error – e.g. small error on the label, which can be resolved quickly) or the shipment is returned to the sender for rectification. The RSL has its own well-established set of rules of dealing with these situations, including quarantine areas at border posts, etc. Therefore, these actions related to post inspection are not to be altered and the usual RSL processes will follow.

5.1.6 MARKET SURVEILLANCE

The above outlined system is likely to create a situation whereby a significant number of refrigerators within Lesotho are complaint with the regulation. However, there are still areas and methods through which non-compliant refrigerators and labels may find themselves on the shop floors and in people's houses. Some of these could be:

- Passing of certain non-compliant refrigerators through the border. The intention is for the RSL to inspect as many refrigerator shipments as possible. They also have a system whereby certain flagged commodities are highlighted for more stringent and regular inspection. The RSL have indicated that they will flag refrigerators for such inspections, especially in the first 6 months after the passing of the regulation – and that this will be assessed thereafter. However, even with all such systems and with the

efforts of the border post personnel certain refrigerators will make it through the border that are non-compliant, as no system is 100% effective.

- The replacement of energy labels at the points of sales or warehouses. The refrigerators may pass through all of the checks with the correct labels and these labels may match the requirements and the refrigerator. However, the labels may be replaced by more efficient ones in order to increase the probability of sale. For example, a refrigerator may have an R value of 1.1. It would thus have a D level of energy efficiency on the energy label. Once in the shop the label may be replaced by a B level one, with all other parameters on the label being kept the same, in order to increase the possibility of sale and to enable the retailer to increase the sale price of the product.
- The mistaken or erroneous loss of label or misplacement of the label. In this instance the label on the shop floor or in the warehouse may be placed on the incorrect refrigerator (for example the labels of two refrigerators may be swapped by mistake). Additionally, the label may get lost during transport or during the moving and positioning within the store or warehouse.

These are the main possibilities of non-compliance a store or warehouse, although some other mechanisms could exist. Importantly, there will be instances where there is non-compliance at the stores. For this reason it is imperative that there is market surveillance performed to reduce this risk and mitigate for its impact on the consumer and the consumer trust in the process. If there is no market surveillance the system gets abused in a very short time. As mentioned, once the process of bringing the refrigerators into Lesotho has been completed they would either be stored in warehouses or shop floors awaiting purchase. During this time market surveillance would be performed. The market surveillance would be performed by LEWA inspectors. However, the RSL would also be available to assist with this task. Between them (and through coordination of information and resources) market surveillance would be conducted. The assigned inspector would go to the specific warehouse or store and randomly inspect the refrigerators. The inspection would not consist of all of the refrigerators in that particular location but rather a random sample size (typically 2 to 3 refrigerators per site). The inspector may choose to extend their sample size, especially if anomalies or non-compliances are discovered. The inspectors would perform checks that are very similar to those performed at the border posts by the RSL personnel. Therefore, the inspectors would check that the refrigerator on the shop floor or in the warehouse has the correct permit and energy label, and that it aligns with the permit and energy label. So the inspector would check:

- That the physical refrigerator model and manufacturer match the one on the permit and the one on the label
- That the permit is still valid and that it is compliant (that the R value on the permit is above 1.00 – MEPS has been reached)
- That the R value on the permit matched the HEPS level on the label
- That the rest of the information on the label matches the permit and is on the actual label (e.g. volumes, energy consumption)

As long as these market surveillance exercises are performed regularly the probability of non-compliance decreases drastically. This is because the possible offenders are aware that inspection is possible and probable and are less likely to attempt to manipulate the system, especially if there are repercussions. This infers that the manner in which non-compliance is dealt with is also critical.

5.1.7 DEALING WITH NON-COMPLIANCES

In order to have a successful implementation of the project there is a need for the Lesotho governmental entities to be able to deal with non-compliances and with offenders. Having all of the systems in place to check compliance at points of entry and at the market is completely necessary and an excellent practice. However, it is not very useful if the regulation does not allow for punitive measures to be taken against offenders. Many measures were discussed during the project, at PWG meetings and NPR workshops on the 14th, 15th, 20th and 21st of September. The decision for implementation in Lesotho was that of a phased approach of measures to be taken against offenders. These measures would depend on the severity of the offence and the number of offences caused by the specific entity. Therefore, repeat offenders would be punished more severely. The approach is to have the following system of measures in place:

- Warnings: These would be given as a first step in the punitive process. The warnings would typically be given to first-time offenders and to less severe offences (e.g. lost label as opposed to a counterfeit label)
- Fines: Fines would be imposed in stages on repeat offenders. Fines would vary per criteria such as frequency of offences and severity of offences. The exact fines have not been decided on as yet and will be decided on during the finalisation of the regulation.
- Quarantine of product: This option would be used as one that would occur in very severe circumstances. It would only be used for repeat offenders and for extremely serious offences. Under this measure the section of the shop or warehouse that houses and sells refrigerators would be sectioned off and would be prevented from operating. The remaining shop or warehouse would be able to continue operating as usual. The quarantine would last until the problem is resolved.
- Suspension of operation: this would be used as a final resort only. It would mean that the particular operator would be suspended from operating its business until the problem is rectified or for a specific period of time as punishment for extreme repeat offenses.

In order for the above-mentioned recommendations to be put into practice a clear plan with set areas of responsibilities is required. The following is the current outline of responsibilities within the Lesotho state owed entities:

- RSL – Inspection of refrigerators at ports, assistance to LEWA in terms of inspection of resellers/dealers/wholesalers as well as confiscation of non-compliant products
- DoE – Drive the development of the regulation and ensure alignment with the National Energy Policy
- LEWA – Drive the development of mechanisms to enforce the regulation that will be developed. Regulatory aspect of compliance –therefore the application process handling, issuing of permits and verification of compliance. Additionally, the market surveillance process would be the responsibility of LEWA
- LSI – Development and maintenance of the national standard and assistance with the verification of conformance of the application/product

These are the roles and responsibilities related to the main processes that are required to be implemented as listed above. Therefore, in order for the full MV&E process to be successfully implemented there are 2 main phases of implementation and action. The first is the development of the system of implementation and the second is related to the responsibilities of ongoing implementation and monitoring.

The implementation actions have been discussed in the previous sub-section. The monitoring process is also critical to the long-term successful implementation of the project. The monitoring process methodology is as follows:

- Define what needs to be monitored
- Define goals
- Define timelines
- Define monitoring processes for each main section with responsibilities

Therefore, following from the outline above, the following process is to be followed as part of the monitoring aspect of the MV&E plan.

Aspects that require monitoring:

1. Implementation of the application IT System
2. Training of relevant personnel
3. Purchases of refrigerators above the MEPS value of energy efficiency (C and above)
4. Energy consumption savings in households

Goals

1. Implement the IT system for the application process by May 2023
2. Finalise employment of additional resources if necessary within LEWA and the RSL by June 2023

3. Train at least 5 resources at LEWA in application reviews and market surveillance by May 2023
4. Increase in purchases of energy efficient refrigerators by 30% in year 2
5. Increase in energy efficiency savings in households by 5% in year 2

From the outline above, he actions, with responsibilities, timelines and verification methods are listed in Table 3 below.

Table 3. Actions, responsibilities and timelines

Action	Responsibility	Timeline	Method of verification
Development of the application system – linking it with Lesotho national IT system and enabling it for usage for market surveillance	LEWA	January 2023	Check of IT system by another party (RSL)
Assessing whether additional resources will be required for the processing of applications and making necessary appointments	LEWA	December 2023	Payroll and organogram
Training of personnel on the processing of applications	LEWA	March 2023	Training certificates, register of attendance
Training of personnel on the border controls	RSL	March 2023	Training certificates, register of attendance
Training of personnel on the market surveillance procedure	LEWA	March 2023	Training certificates, register of attendance
Energy efficient purchases of refrigerators	June 2025	Surveys at shops, consumers	LEWA
Energy savings of 5% for consumers	June 2025	Consumer surveys	LEWA

In addition to the above plans an implementation budget has been developed. This implementation budget has been broken down per key activity and is presented in Table 4 below. The budget considers the cost of implementation and monitoring for the period of 3 years.

Table 4. Budget Estimate for the implementation of the MV&E in Lesotho

Activity	Cost LSL	Comment/assumptions
Standard Distribution	20,000.00	Administrative costs and legal costs of distribution of standards to key stakeholders
Internal training	1,100,000.00	Cost of training personnel and training facilities. From costs of meetings it is estimated at LSL39 285 per training session with an estimate of 28 sessions.
IT system for application processing	2,000,000.00	IT personnel costs for system upgrade at scale of similar projects based on experience from South Africa (3 month project – taking into account complexity)
RSL inspectors at borders	3,000,000.00	Additional personnel and equipment. Taking into account border posts that accept goods, the estimate is for 2 additional persons (roaming between border posts) at LSL 360 000 per person year x 2 x 3 years = LSL2 160 000 and the additional LSL840 000 is budgeted for tablets and scanners (additional IT infrastructure)
Surveillance inspectors	3,000,000.00	Similarly 2 additional surveillance inspectors budgeted for 3 years, amounting to LSL 2 160 000 and the remaining LSL840 000 for surveillance equipment (tablets, etc.)
Dealing with non-compliance - legal	1,000,000.00	Cost of a legal person at 30% of time (contract as and when needed) for 3 years
Warehousing	500,000.00	Cost of additional warehousing at border posts. RSL has the premises available but the costs are for annual maintenance over 3 years
Administrative	458,700.00	Estimated at 10% of total budget
Miscellaneous	458,700.00	Estimated at 10% of total budget
Laboratory testing of samples	3,500,000.00	Cost of testing estimated at LSL70 000. 15 tests budgeted per year, therefore 45 for 3 years. This amounts to LSL2 700 000 and the remaining LSL800 000 budgeted for transport of samples to Eswatini or South Africa
Monitoring	1,200,000.00	One additional resource budgeted at LSL30 000 per year for 3 years, amounting to LSL1 080 000 and the remaining cost is for the equipment required (tablet, computer, etc.)
Total (LSL)	**18,194,000.00**	
Total USD (Rate $1 = LSL 18)	**1,024,666.67**	

The above figures are estimates and certain assumptions were made to contribute to the figures. The monthly salary of personnel was averaged at LSL 30 000. This is related to full time (40 hours per week) employment. Therefore, the implementation cost is approximately $1 million.

6 Conclusion

This report outlines the MV&E plan for refrigeration in Lesotho. The MV&E plan is important in order to define the monitoring, verification and enforcement of the energy efficiency of refrigerators in the country. The MEPS for Lesotho has been developed for refrigerators and is part of the new national standard that is being published. The energy label has also been drafted and will be enforced as part of the regulation that will be developed in Lesotho. In order to enforce the MEPS and the energy label and to monitor the impact on the number of more efficient refrigerators utilised in the country an MV&E plan has been developed as part of this report. The MV&E plan includes the PRS that will be implemented to process the applications of refrigerators entering the country. The full PRS has been outlined, combined with specific responsibilities within the governmental departments and regulators. Various other aspects of the MV&E plan have been detailed to enable the Lesotho national stakeholders to implement the plan and reach the objectives of improved energy efficiency of refrigerators in the country. These include the processing of applications, verification of conformity assessment, issuing of permits, border controls for compliance, market surveillance and dealing with non-compliances. The regulatory and policy framework within Lesotho in which the abovementioned tasks are to be implemented has been outlined, so that the implementation can be aligned with the current framework and so that the various responsibilities are aligned with the respective capabilities within the departments and entities. Finally the overall objectives of the MV&E plan have been outlined, which include the increase in energy efficient refrigerators in Lesotho, the increase in overall energy efficiency of energy consumption of the country and the implementation of the MEPS. The budget for the MV&E plan has also been outlined. From the MV&E plan presented the Lesotho national stakeholders have agreed to formulate a working group that will review the various aspects of the plan and begin the implementation tasks according to the outlined responsibilities and timelines.

7 References

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