Chapter 4

Standard and Labelling

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Chapter 4

Standards and Labelling

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1. Introduction

Organisations put in place standards to have a basis for making a judgement and a commonly agreed way of doing things within or beyond the organisations. Standards provide requirements, specifications, guidelines, or characteristics that can be used consistently to ensure that materials, products, processes, and services are fit for their purpose.

Labelling is a way of identifying products and/or services; it gives the user a way of recognising such products and/or services and differentiate these via a set of criteria or set standards.

1.1. Energy labelling

Energy efficiency labels are informative labels affixed to manufactured products indicating a product's energy performance. They provide consumers with the information necessary to make a knowledgeable purchase decision. Some countries mandate that energy labels be displayed on certain electrical products for sale.

Energy rating and labelling have been a cornerstone in the market transformation of household appliances towards more energy-efficient models. They have been successfully applied worldwide in Europe, the United States, Japan, Australia, Thailand, etc. for more than a decade and have resulted in significant improvements in the energy efficiency of the technologies.

1.2. Minimum energy performance standards

A Minimum energy performance standard (MEPS) provides performance requirements for energy-related products, specifically the minimum amount of energy to be consumed in performing a product’s task. Energy performance improvements in consumer products are an essential element in any government initiatives and objectives for energy efficiency and climate change mitigation programmes. Generally, a MEPS is implemented by a government energy efficiency body. The initial stages of a MEPS are voluntary and amendments are then made to the existing act or directive to regulate products, thus, making MEPS mandatory to the respective country. A MEPS generally requires standards to be developed and agreed, followed by setting up of test procedures that provides the measurement of the standards set.

If MEPS were to be made mandatory, only the electrical products that are listed in energy labelling, meeting the requirements of MEPS, are allowed to be offered for sale or used for commercial purposes. Therefore, MEPS and energy labelling are recommended to be used as part of the energy efficiency strategies to improve energy performance in Cambodia.

MEPS generally requires the use of a particular test procedure that specifies how performance is measured. With the MEPS in place, an energy labelling system shall be used, and registration of the equipment shall be done based on the labelling categories or ratings system. This would set an energy benchmark to the equipment used and purchased by end users.

Five member states of the Association of Southeast Asian Nations (ASEAN) – Malaysia, the Philippines, Singapore, Thailand, and Viet Nam – have adopted MEPS and labelling schemes. Some countries that have implemented energy labelling and MEPS are listed in Table 4.1.

1.3. Current scenario in Cambodia

Based on the numerous workshops conducted by the Economic Research Institute for ASEAN and East Asia (ERIA) with the Ministry of Mines and Energy (MME), there are already some initiatives to implement MEPS and energy labelling for certain electrical appliances (refrigerator and air conditioning) as a pilot project. The project is now in the final stage of issuance of the draft sub-decree. However, although MEPS and energy labelling are already in progress, no specific road map and finalised initiatives for the entire household equipment are yet in place.

As part of the energy efficiency measures, the electrical equipment used is recommended to comply with the MEPS which, in turn, will reduce the overall power consumption of the said premises. With MEPS in place, an energy labelling system shall be used, and registration of the equipment shall be done based on the labelling categories. This would set an energy benchmark to the equipment. Therefore, any equipment that meets all the requirements of efficient electricity use shall be affixed an efficiency rating label in such form and manner as may be determined by the MME.

The following sections will provide the **current gaps** and **future proposed road map** in implementing MEPS and energy labelling in Cambodia.

Table 4.1: List of Countries that Adopted Energy Labelling

	Country	Programme Name	Implementing Agency	Participation Mode
	Malaysia	Energy Efficiency Criteria for Material and Electrical Equipment to Qualify for the Minimum Energy Performance Standards Star Rating	Suruhanjaya Tenaga (Energy Commission of Malaysia)	Mandatory
	China	China Energy Label	The China Energy Label Center; part of the China National Institution of Standardization	Mandatory
	Japan	Uniform Energy Saving Label	Ministry of Economy, Trade and Industry, Japan (METI)	Mandatory
	European Union (EU)	EU Energy Label	National bodies of EU member countries	Mandatory
	United States of America (USA)	Energy Guide	USA Federal Trade Commission	Mandatory
	Indonesia	Energy Efficiency Labelling	Ministry of Energy and Mineral Resources	Mandatory/Voluntary
	Singapore	Mandatory Energy Labelling Scheme	National Environment Agency, Singapore	Mandatory
	Viet Nam	Energy Label	Ministry of Industry and Trade, Vietnam	Mandatory/Voluntary
	Philippines	Philippine Appliance Energy Standards and Labelling Programme	Department of Energy, Philippines	Mandatory
	Thailand	Energy Efficiency Label No. 5	Electricity Generating Authority of Thailand	Voluntary

Source: Author's research and compilation.

2. Identification of Relevant Institutions

Whilst the focus is to develop MEPS requirements, it is also essential to identify the new or existing local institutions and potential agencies to be appointed to carry out MEPS activities.

These include standard-writing organisations (SWOs) for electrical equipment labelling standards, the testing bodies for testing of compliance, and certification bodies for certificates of approval.

2.1. Standard-writing organisation

A standard-writing organisation (SWO), standard-developing organisation, or standard-setting organisation is a firm or entity whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise producing technical standards on energy-efficient equipment intended to address the needs of a group of affected adopters.

In most countries, most standards are voluntary; they are offered for adoption by people or industry without the mandate of law. Some standards become mandatory when they are adopted by regulators as legal requirements in particular domains.

2.2. Testing bodies

Testing bodies independently verify compliance of products with energy efficiency standards and regulations. They provide an independent assurance that tests are done according to stated specifications and test methods in the standards produced by the SWOs. Testing bodies also enhance customers' acceptance and confidence on the quality, reliability, and safety of products. They help minimise the risk of consumers buying an inferior product not in compliance with energy efficiency standards or requirements.

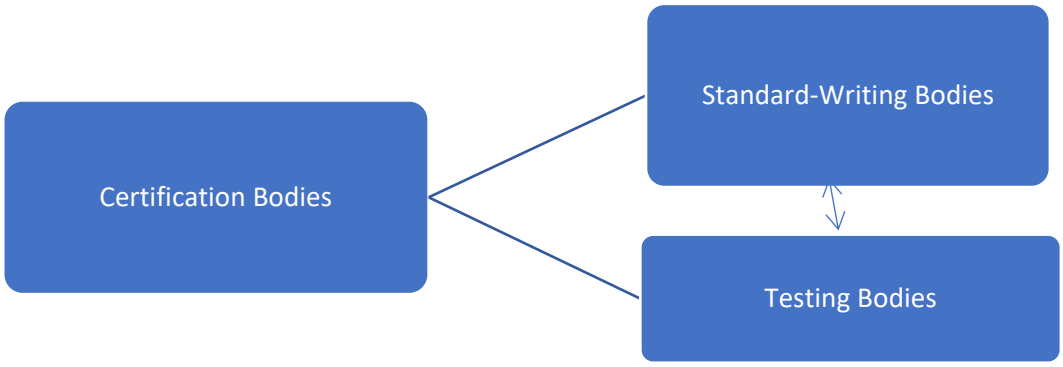
2.3. Certification bodies

Certification bodies are independent bodies responsible for the assessment and accreditation of certain organisations. In our context, they are the SWOs and testing bodies for energy labelling and standards. Certification bodies provide conformity certificates to organisations for their various management systems, individual as well as product manufacturers and service providers. Accreditation is the formal recognition by an independent body, generally known as an accreditation body, that a certified body operates according to international standards.

2.4. Setting up of institutions

In the context of energy labelling and standards, the above institutions should work togther to ensure the success of the implementation of labelling and standards (Figure 4.1). The SWOs for electrical equipment labelling standards will produce the required MEPS, which incorporate testing requirements or conformance standards. The testing bodies will then test the respective MEPS-complied products accordingly. The certification bodies will assess the standards made and requirements of testing bodies to ensure both bodies comply with the standards.

Figure 4.1: Interrelation between Institutions



Source: Author.

3. Selection of Targeted Appliances

A wide range of electrical appliances are produced in the market for consumers. Targeted appliances to be selected for labelling – such as lighting, refrigerator, air conditioning, fan, television, water heater, washing machine, and others – shall be reviewed in terms of their market availability, distribution, and power consumption contributions to the entire energy utilisation. Hence, the selection of the targeted appliances is suggested to be done in two stages: stage 1 for residential appliances and stage 2 for commercial/industrial appliances and equipment.

The priority for labelling should be given to residential appliances. This is because the preliminary focus is to reach a wider range of, and more common, appliances used in the market compared to commercial and industrial equipment which are more specific and unique. Another consideration is the market share of the product selected for energy labelling and standards to achieve a greater impact in energy savings. Table 4.2 outlines some countries' appliances with MEPS and energy labelling and their status.

3.1. Selection of pilot project appliance

The MME, through the ASEAN SHINE Programme, initiated a pilot project to set up the MEPS requirements for air-conditioning system. A draft Sub-decree on Energy Efficiency Standard and Labelling for Air Conditioners is in place and approval is being sought.

One or two pilot projects are recommended to be chosen to formulate the necessary MEPS and energy labelling. Besides the air-conditioning system, we are also recommending that lamps be chosen as well. This is in line with the countries that had adopted MEPS and energy labelling. Lamps are also one of the most-used electrical appliances consumed in typical homes with potential for local manufacturing.

After choosing the pilot project, the following steps are recommended to be adopted in producing a good MEPS:

1) Select a MEPS rating reference.
2) Choose a reference from amongst ASEAN countries to be adopted as guide.
3) Form a working group for MEPS and energy label rating, which includes all stakeholders in the country.
4) Draft the MEPS requirements.

Table 4.2: Selected Countries' Appliances with MEPS and Energy Labelling and their Status

Country	Indonesia	Thailand	Malaysia	Singapore	Philippines	Viet Nam	United States	Japan	European Union	China	Lao PDR	Myanmar	Brunei	Cambodia
Air-conditioning system	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	X	X	X	X
Fan	YES	YES	YES	X	X	YES	YES	X	YES	YES	X	X	X	X
Refrigerator	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	X	X	X	X
Lamp	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	X	X	X	X
Television	YES	YES	YES	YES	X	YES	YES	YES	YES	YES	X	X	X	X
Washing machine	YES	YES	YES	X	X	YES	X	X	X	YES	X	X	X	X

Source: Author, based on respective countries' official websites, as follows:
Indonesia – http://www.ebtke.esdm.go.id/
Thailand – http://labelno5.egat.co.th/
Malaysia – https://www.st.gov.my/web/consumer/details/7/2
Singapore – https://www.nea.gov.sg/
Philippines – https://www.doe.gov.ph/pelsp–ig
Viet Nam – http://www.moit.gov.vn/
United States – https://www.ftc.gov/news-events/media-resources/tools-consumers/energyguide-labels
Japan – https://meti.go.jp/english/policy/energy_environment/energy_efficiency/index.html
European Union – https://ec.europa.eu/environment/ecolabel/competent-bodies.html
China – https://en.cnis.ac.cn/

3.2. Common Requirements for MEPS

A few new common criteria are observed and used in setting up MEPS, as follows.

1) Scope

   The standards proposed shall define the products that shall be included in the standards. Inclusion or exclusion of products could be based on the product type, power rating, or usage type.

2) Normative standard

   The standards set shall have a set of normative reference standards to refer to any existing performance standards, international standards such as the International Electrotechnical Commission (IEC), American Society of Heating Refrigerating and Air-Conditioning of Engineers, etc. and reference requirement for the condition, testing method, and performance.

3) Terms and conditions

   The specific terms and conditions shall be identified for the appliances. These include the following:

   a) The standards that will depict the parameters to be used to determine the appliance's performance, such as:

      - Fan : Coefficient of performance (COP)
      - Refrigerator : Energy efficiency factor (EEF)
      - Air conditioner : Energy efficiency ratio (EER)
      - Television : Energy efficiency factor (EEF)
      - Lamp : Efficacy

   b) Minimum energy performance standards – the required minimum level of energy will be defined.

      Star rating requirements – A range of ratings and requirements to define the level of compliance of the energy performance. The common method will be to categorise the star rating and range, such as star rating 1 to 5. Some appliances such as lamps do not require any star rating.

3.3. Choosing a reference from an ASEAN country to adopt as guide

Since some ASEAN countries – such as Malaysia, the Philippines, Singapore, Thailand, and Viet Nam – have energy labelling and MEPS requirements in place, Cambodia can refer to these countries in terms of the requirements because of regional suitability, environmental conditions, and availability of similar regional products.

3.4. Formation of working group for MEPS finalisation

With the above in place, a working group shall be set up to draft the MEPS for a particular appliance. As far as practicable, the working group should involve relevant stakeholders such as the regulators, suppliers, testing bodies, end users, designers, distributors, manufacturers, and others involved in the products.

3.5. Typical standards-writing procedure

After the working group is formed, it would then work on the writing of standards. The publication of standards is the result of an agreement between all stakeholders.

The preparation of the typical new standards involves the following stages: preliminary, proposal, preparatory, enquiry/review, approval, and publication.

The preliminary stage normally consists of projects envisaged for the future but not yet ripe for immediate development – or preliminary work – such as better definition of a project for new work, data collection, or round-robin tests necessary to develop standards, which are not part of the standardisation process.

The preliminary stage is applied for work items where no target dates can be established. This stage can be used to elaborate a new work item proposal and develop an initial draft. These work items are subject to approval according to normal procedures before progressing to the preparatory stage.

The next stage is the proposal stage whereby the preliminary outline of the standard is circulated to stakeholders for feedback before deciding whether to proceed.

During the preparatory phase, a working draft is prepared. The preparatory stage ends when a working draft is available for circulation to the working group members. The committee may also decide to publish the final working draft to respond to particular market needs.

During the enquiry/review stage, the working draft standards are made available and published for comments and/or amendments. If these are relevant, a final draft is then produced.

The final draft is discussed amongst the working group members; if approved, it will be sent for final draft publication or subsequent further approval by higher management.

4. Testing Bodies

Another important element of MEPS and energy labelling is the testing facilities available to carry out the product appliance compliance test to MEPS. We have reviewed the existing lab facilities in Cambodia, which could carry out various tests to comply with the requirements. We have also reviewed the current international and regional labs to assist with the testing to conform with the standards set. Currently, no accredited testing labs in Cambodia exist. There is only an electrical product safety certification scheme by third-party testing.

The Institute of Standards of Cambodia (ISC) via its ISC Product Certification Scheme provides rules for a third-party certification system of conformity assessment through testing and assessment of the factory quality management system. The scheme is imperative for products covered under mandatory standards.

Manufacturers are required to apply for a product registration licence to affix the ISC mark on products. The products are compliant with Cambodian standards and/or those of the International Electrotechnical Commission (IEC). Foreign manufacturers, through a local representative, also need to sign an agreement to use the ISC mark.

Because of the unavailability of a certified test laboratory in Cambodia, the country could, for a start, collaborate with some of the regional test laboratories to carry out the tests accordingly. Numerous internationally accredited test laboratories are available and registered under the ASEAN Secretariat. These are listed as testing laboratories and certification bodies under the ASEAN Sectoral Mutual Recognition Agreement (MRA) for Electrical and Electronic Equipment.

Whilst no existing laboratories or labs are available for immediate acceptance of MEPS and required energy labelling, Cambodia should also develop its own testing bodies and labs. Following are the typical procedures in obtaining test lab competency and accreditation internationally.

4.1. Designation and set-up

A testing laboratory is to be identified and designated as the testing body for the country. The testing lab shall have the following competencies:

1) Accreditation to ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) or ISO/IEC 17025:2005, which specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling. It covers testing and calibration performed using standard methods, non-standard methods, and laboratory-developed methods.
2) Participating in the IECEE CB Scheme (IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components) Certification Body Scheme. The IECEE CB programme is a globally standardised approach to test and verify energy efficiency for electrical and electronic equipment, based on IEC International Standards.

It aims to prevent duplication of testing, reduce costs, and support global trade in a timely manner. The IECEE CB programme will provide proof of compliance to IEC International Standards in terms of energy efficiency in general and, more particularly, in energy performance, and energy consumption.
The testing laboratory then obtains the certificate of designation from the designated body.

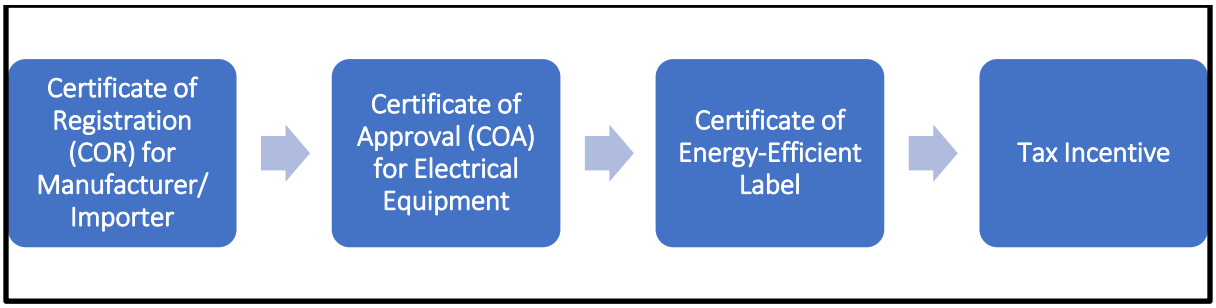
4.2. Nomination and listing in ASEAN

To ensure that the testing body is also in the ASEAN-designated testing lab list, the country shall nominate the testing lab to the respective committee, JSC EEE (the ASEAN Joint Sectoral Committee on Electrical and Electronic Equipment). Upon approval, the testing lab will be listed in the ASEAN website.

4.5. Registration of MEPS and Energy Labelling

With standards in place and the testing body set up, the next action shall be the registration of MEPS and energy labelling of the product (Figure 4.2).

Figure 4.2: Registration Process of MEPS and Energy Labelling of Electrical Appliances



Source: Author.

5.1. Proposed regulations for certificate of registration for manufacturer/importer

A certificate of registration should be issued to the manufacturer or importer of the product. The certificate will ensure that any person who manufactures or imports any regulated equipment shall apply to be registered. A renewal period for the certificate is suggested to ensure that the registration of the products is active and up to date. The products may include electrical equipment and other household products.

5.2. Proposed regulations for certificate of approval for electrical equipment

Upon the registration of products, the relevant authorities can monitor the approval for electrical equipment. The certificate of approval (COA) could be issued to such electrical equipment. Hence, with the certificate, no person shall manufacture, import, display, sell, or advertise any electrical equipment; any low-voltage equipment which is usually sold directly to the general public; or any low voltage equipment which does not require special skills in its operation, unless the equipment is approved by the authority.

5.3. Proposed regulations for energy efficiency label

With the certificates of registration and approval in place, the manufactured electrical equipment which then meets all the requirements of efficient use of electricity shall be affixed with an energy efficiency rating label in such form and manner as may be determined by the relevant authority. The general minimum requirement shall be a recognised test report which could be produced by any of the following laboratories: (i) lab under IECEE CB Scheme, and (ii) accredited lab by APLAC (Asia Pacific Laboratory Accreditation Co-operation) MRA.

APLAC developed a regional MRA: (i) accredited lab by ILAC (International Laboratory Accreditation Cooperation) MRA, and (ii) lab listed as designated testing laboratory under the ASEAN EE MRA.

5.4. Proposed tax rebate

A tax rebate could also be introduced to encourage the registration and certification of equipment. Some of the tax rebates that could be introduced are those (i)for consumers for every purchase of energy-efficient equipment, (ii)for manufacturer of green products, and (iii)for house developers for use and installation of energy-efficient equipment.

Companies providing services to improve energy efficiency are eligible for the following:

1) Pioneer status with an income tax exemption of 100% of the statutory income for 10 years.
2) Investment tax allowance of 100% on the qualifying capital expenditure incurred within 5 years. The allowance is to be offset against 100% of the statutory income for each year of assessment.
3) Import duty and sales tax exemption on energy-efficient equipment that are not produced locally, and sales tax exemption on the purchase of equipment from local manufacturers.

6. Role of the General Department of Energy, Ministry of Mines and Energy (MME)

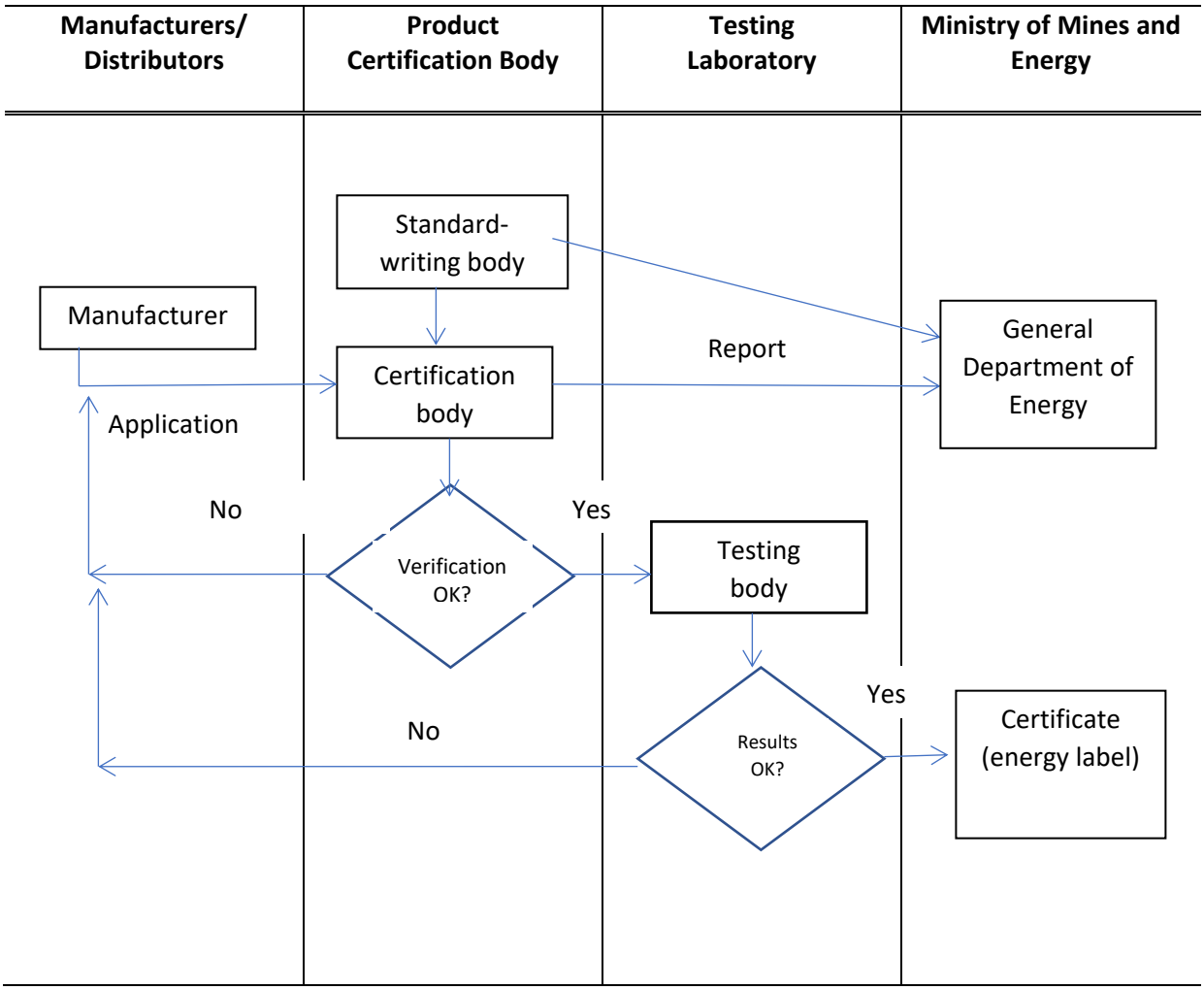
Each stakeholder of MEPS and energy labelling, including the GDEMME, plays an important role in the success of their implementation. The GDE, as the principal regulatory body of energy efficiency projects, has the following functions:

1) Coordinate and promulgate the relevant law, regulations, and standards of energy-efficient products and labelling;
2) Enforce standards into regulations and laws and conversion of the voluntary requirement into mandatory requirements;
3) Issue certificates of approval of electrical products and energy labelling;
4) Administer, monitor, and audit approved and disapproved electrical products or energy labelling;
5) Review or propose incentives for the use of energy-efficient products or labelling.

7. Road Map

Figure 4.3 summarises the implementation of MEPS and energy labelling.

Figure 4.3: Flow Diagram of the MEPS and Energy Labelling Programme



Source: Author.

A detailed road map is to be provided for the setting up of a framework on labelling of energy-efficient equipment (Table 4.3).

This includes the following:

1) Moving for inclusion of standards in energy-efficient equipment;

2) Identification of institutions/bodies to be involved in setting up labelling;

3) Identification of electrical equipment for labelling and its ratings;

4) Setting up of testing labs conforming to regional test labs requirements; and

5) Registration of the energy labelling product.

Table 4.3: Road Map and Implementation Programme for MEPS and Energy Labelling

Phase	Milestones Activities	Target Groups	Organisations Involved	Time Schedule
Phase 1	Stakeholders engagement	GDE	Engineering institutions and associations Regulatory bodies Standard-writing organisations Consumer associations	1 year
Phase 2A	Setting up of registration requirements	GDE	GDE	3 years
Phase 2B	Setting up of certification and assessment bodies/standard-working group/testing bodies for MEPS	GDE and ISC	GDE and ISC	1 year
Phase 3A	Certification and assessment bodies	GDE and ISC	GDE and ISC	1 year
Phase 3B	Standards working group	GDE and ISC	All stakeholders	2 years
Phase 3C	Testing lab	GDE and ISC	Appointed lab	5 years

GDE = General Department of Energy, ISC = Institute of Standards of Cambodia, MEPS = minimum energy performance standard.
Source: Author.

Phase 1 Stakeholders Engagement

The immediate task foreseen at the initial phase is to gather all stakeholders together to develop MEPS and energy labelling. This includes identifying relevant stakeholders such as the regulatory bodies, the SWOs, consumers, engineering institutions, contractors, distributors, manufacturers, design engineers, and others. The discussion and presentation of draft road map for further inputs and additional ideas are being sought from the stakeholders. This is followed by the setting of the terms of reference on MEPS and energy labelling. It is necessary to identify the task force amongst the stakeholders to monitor the following tasks: (i) registration requirements, (ii) certification/assessment, (iii) standard writing, (iv) testing and verification, and (v) enforcement.

Phase 2 – Setting Up of Institutions

The next phase shall be the setting up of institutions and identification of their roles as follows:

1) Certification and assessment bodies

The role of certification and assessment bodies is to be established.

2) Standard-writing organisations (SWOs)

The role of SWOs (standards for MEPS and procedures in developing and finalising a standard) is to be established.

3) Testing Bodies

The role of testing bodies (procedures for set-up and compliance to international requirements) is to be established.

Phase 3 – Setting up of Registration

With the institutions in place, relevant amendments to acts, regulations, and circulars shall be made to incorporate changes for MEPS and energy labelling. This includes the registration of electrical products and energy labelling products. Enforcement to monitor the implementation of MEPS and energy labelling shall also be put up to ensure success of the implementation.

Phase 4 – Implementation

The final phase of the road map shall be the establishment of the following institutions: (i) certification and assessment bodies, (ii) SWOs, (iii) Cambodian standard on MEPS, (iv) testing bodies with the establishment of a local test lab for MEPS, and (v) full enforcement of MEPS implementation.

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