Consultancy Services to Implement Harmonised Regulatory/Technical Frameworks and Synthesized Renewable and Energy Efficiency Strategies in the EA-SA-IO Region

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Consultancy services to implement harmonised regulatory/technical frameworks and synthesized renewable and energy efficiency strategies in the EA-SA-IO region

This assignment will support the Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC), Intergovernmental Authority on Development (IGAD), Indian Ocean Commission (IOC), and Southern African Development Community (SADC), in their collective efforts to promote the development of a sustainable regional energy market in the Eastern Africa, Southern Africa, and Indian Ocean (EA-SA-IO) region.

Report

Standards and Labeling: Policies Database.

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Opinions and Limitations

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Contact

Questions and comments on this report can be directed to:

Anirudh (Rudy) Gautama
Project Manager
E: agautama@cpcs.ca

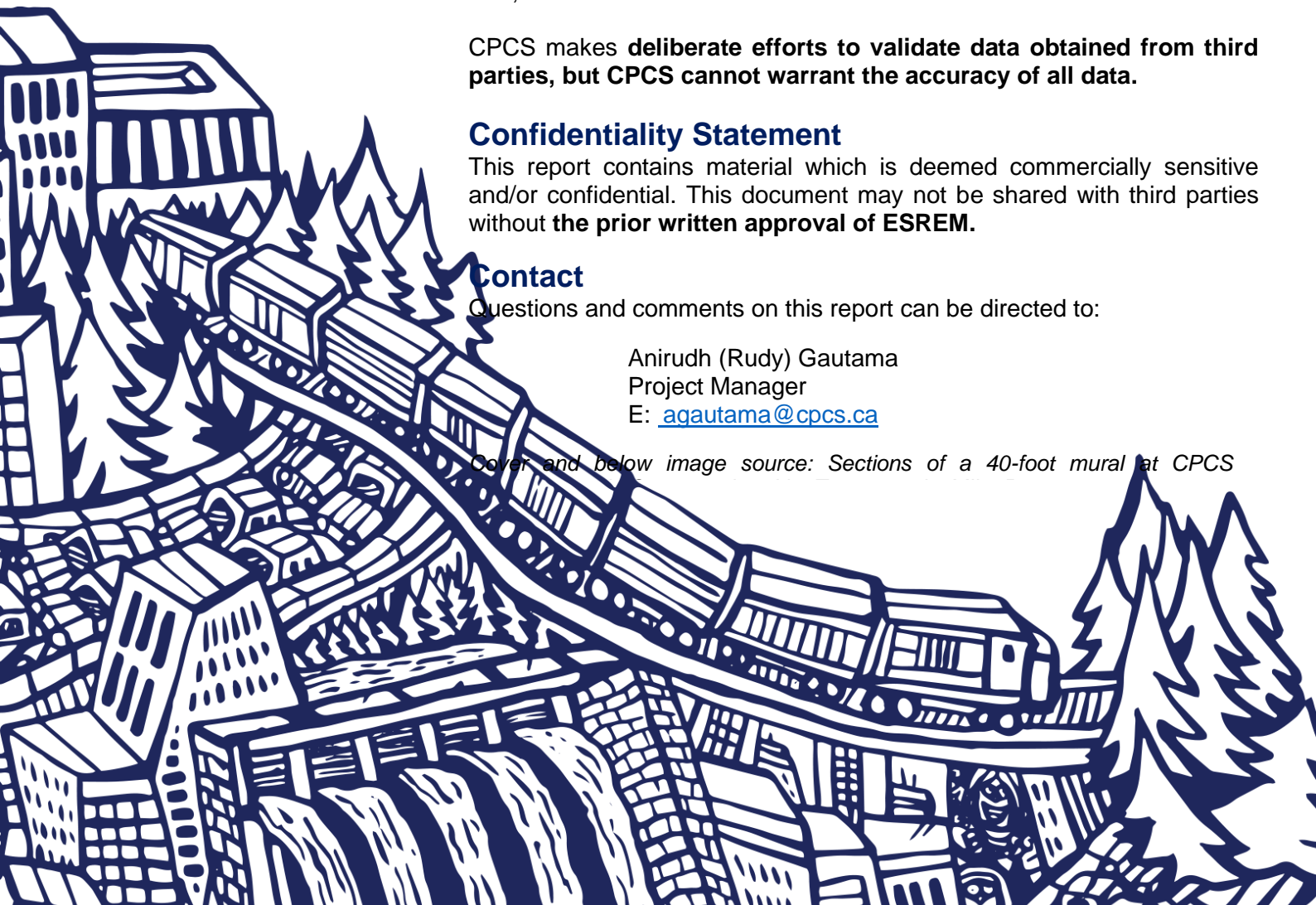*Cover and below image source: Sections of a 40-foot mural at CPCS*

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Acronyms / Abbreviations

AfDB	African Development Bank
CFL	Compact fluorescent lamp
CIE	International Commission on Illumination
CLASP	Collaborative for Labeling and Standards Project
CTCN	Climate Technology Centre and Network
DSM	Demand-side management
EA-SA-IO	Eastern Africa-South Africa-Indian Ocean
EAC	East African Community
EACREEE	East African Centre of Excellence for Renewable Energy and Efficiency
EBRD	European Bank for Reconstruction and Development
ECOWAS	Economic Community of West African States
EE	Energy efficiency
EELA	Energy Efficiency Lighting and Appliances (project)
EU	European Union
HEPS	High energy performance standard
IEC	International Electrotechnical Commission
LED	Light-emitting diode
MEPS	Minimum energy performance standard
MRA	Mutual recognition agreement
MVE	Monitoring, verification, and enforcement
RAERESA	Regional Association of Energy Regulators for Eastern and Southern Africa
RE	Renewable energy
S&L	Standards and labelling
SADC	South African Development Community
SE4ALL	Sustainable Energy for All
UNEP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
WB	World Bank

Executive Summary

Energy efficiency is an affordable means of approaching sustainable development and climate change mitigation efforts. Widespread adoption of energy-efficient products and building codes can reduce overall energy use at the homes, building and municipal levels. Rating and labeling schemes help consumers identify efficient products and buildings that cut air pollution emissions by reducing end-use electricity and fuel consumption, which in turn reduces the amount of generation and direct fuel consumed. Some product labeling and standards policies also create other benefits, such as improved equipment performance, health, and an improved quality of life.

Currently, countries in the EA-SA-IO regions are at different stages of standards and labeling (S&L) policy development. Some are in the process of implementing binding minimum energy performance standards (MEPS) or labelling primarily targeting electrical equipment (including some off-grid appliances); others are starting the development of MEPS as well as the supporting legal and regulatory framework to implement energy efficient S&L policies and supporting actions.

International experiences have demonstrated that the best results for advancing markets to energy efficient products are achieved when implemented with a standards and labeling (S&L) approach. The use of minimum energy performance standards (MEPS) has led to the wide consumer adoption of efficient, quality appliances and lighting products in many regions. Harmonisation or alignment of MEPS and labeling requirements across the regions and borders will help to leverage the effect of the policies by reducing barriers to trade and enabling businesses to reduce costs.

In addition, the coordination of requirements also means that best practices and lessons learned on national implementation can be shared among the countries. As a further advantage, harmonising energy efficiency standards for products with those of large markets (such as the EU or US, for example), could mitigate the dumping of inefficient and environmentally harmful products by manufacturers.

The objectives of these Guidelines are to provide policy makers with:

- A broad understanding of how energy efficient standards and labelling policies can help address existing barriers to the adoption of energy efficient appliances and help transform markets in the EA-SA-IO regions;

- Guidance on the development of S&L policies, the rationale and steps needed for adopting, aligning, or harmonising S&L policies, technical details, or requirements;

- A survey of available tools that can assist agencies in the adoption, alignment, or harmonisation process, and recommendations for a suitable international database tool for S&L development.

Advancing policies that shift markets toward energy-efficient products is not only beneficial for governments but also for households and businesses who enjoy the resulting energy and cost savings. Well designed and integrated S&L policies covered by other Guidelines under this assignment (and many other programs) can help address barriers and challenges to the increased adoption of energy efficient products, and deliver significant consumer benefits as well as reduction in fossil fuels-related greenhouse gas (GHG) emissions and other pollutants.

1 Introduction

1.1 Authority of the Guidelines

These Guidelines are prepared under the authority of the contract signed on 11 May 2020 between the Regional Association of Energy Regulators for Eastern and Southern Africa (RAERESA), an agency of the Common Market for Eastern and Southern Africa (COMESA), and CPCS Transcom International Limited (CPCS) to provide consultancy services "to implement harmonised regulatory/technical frameworks and synthesised renewable and energy efficiency strategies in the EA-SA-IO regions."

1.2 Purpose of These Guidelines

Energy efficiency is an affordable means for nations to address the issues of sustainable development and climate change mitigation. Widespread adoption of energy efficiency can assist countries with their emission reduction targets, reduce dependencies on fossil fuels and increase energy security. Policies that shift markets toward energy-efficient products can reduce a country's overall energy demands from buildings and residences. Adoption of energy efficient appliances and equipment can also improve citizens' quality of life by lowering their energy expenditures while affording access to reliable electricity.

International experiences have demonstrated that the best results for advancing markets to energy efficient products are achieved when implemented with a standards and labeling (S&L) approach. The use of minimum energy performance standards (MEPS) has led to the wide consumer adoption of efficient, quality appliances and lighting products in many regions. Some product labeling and standards policies also create other benefits, such as improved equipment performance, health, and quality of life.

Currently, countries in the EA-SA-IO regions are at different stages of standards and labeling (S&L) policy development. Some are in the process of implementing binding minimum energy performance standards (MEPS) or labelling primarily targeting electrical equipment (including some off-grid appliances); others are starting the development of MEPS as well as the supporting legal and regulatory framework to implement energy efficient S&L policies and supporting actions.

One of the many challenges arising from having countries at various stages in their development and implementation of S&L is the abundance of different national standards addressing common products or appliance categories across regions and borders. As standards proliferate, manufacturers of regulated and traded products are presented with the daunting task of meeting requirements from different national standards for each product in order to reach these markets. Typically, meeting these different requirements means manufacturers must account for the costs of testing and qualifying their products for multiple markets[1].

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[1] Specific to the development of MEPS and labelling requirements for appliances in the EA-SA-IO regions, some key activities are currently being implemented under the Energy Efficient Lighting and Appliances (EELA) project. EELA, which is aimed at supporting the development of vibrant markets for energy efficient lighting and appliances across East and Southern Africa and address the large energy saving potentials offered by these product categories. A key EELA objective is to support the development and harmonization of minimum energy performance standards (MEPS) for room air conditioners and residential refrigerators (cooling products).

Harmonisation or alignment of MEPS and labeling requirements across the regions and borders will help to leverage the effect of the policies by reducing barriers to trade and enabling businesses to reduce costs. In addition, the coordination of requirements also means that best practices and lessons learned on national implementation can be shared among the countries. As a further advantage, harmonising energy efficiency standards for products with those of large markets (such as EU or US, for example), could mitigate the dumping of inefficient and environmentally harmful products by manufacturers.

One key element that can assist in the adoption, alignment or harmonisation of programmatic details, standards or labeling requirements is the ability of responsible agencies to access and review, or even compare the existing S&L policies for a particular appliance or product category from other countries. This is especially useful for those countries at the same development level, trading or cooperation block, or in the same geographical region.

Recognizing the benefits of energy efficiency and the need for policy details as well as technical information access, many international organisations have developed a variety of on-line policy database tools on a range of energy topics for different users and needs, including those in the energy efficiency and renewable energy area. These Guidelines will provide a survey of these tools and recommend the most appropriate tool for use by countries in the EA-SA-IO regions in their development of S&L policies.

The objectives of these Guidelines are to provide policy makers with:

- A broad understanding of how energy efficient standards and labelling policies can help address existing barriers to the adoption of energy efficient lighting and appliances and help transform markets in the EA-SA-IO regions.

- Guidance on the development of S&L policies, the rationale and steps needed for adopting, aligning, or harmonising S&L policies, technical details, or requirements.

- A survey of available tools that can assist agencies in the adoption, alignment, or harmonisation process, and

- Recommendations for a suitable international database tool for S&L development.

1.3   Structure of These Guidelines

The remainder of the Guidelines is structured as follows:

- ➤ Chapter 2 provides policymakers with a broad understanding of the development process for energy efficient standards and labelling policies;
- ➤ Chapter 3 discusses the rationale and steps needed for adopting, aligning, or harmonising S&L policies;
- ➤ Chapter 4 summarizes the findings from an international survey of available tools and their suitability in assisting countries and agencies in the adopting, aligning, or harmonisation process;
- ➤ Chapter 5 provides recommendations for a suitable database tool for S&L development in the EA-SA-IO regions.

2 Standards and Labeling Overview

2.1 The Standards and Labeling Approach

Minimum energy performance standards (MEPS) serve as the foundation upon which policy makers can build a successful market transition to energy efficient appliances and products. This approach is designed to stop or inhibit the least efficient products from entering the market nationally or regionally, and provides an opening for more efficient products, which ultimately helps to increase consumer adoption, resulting in overall energy and emissions savings[2].

2.1.1 Establishing Minimum Energy Performance Standards (MEPS)

The steps needed to develop MEPS for products and appliances are covered briefly in this chapter. Please refer to the S&L Guidelines which were also developed under this mandate for further details. These steps are based on those outlined by United Nations Environment Programme (UNEP), primarily for lighting programmes. However, the process is applicable to developing MEPS for other appliances and product categories[3]. This process is also repeatable, especially the review and update steps, and should not be overlooked.

For developing product and appliance MEPS, the performance parameters, stringency, and implementation periods are subject to definition and variation for each specific programme and product category as informed by market conditions, but also other relevant programs in the region, where applicable. It should be noted that the degree of stringency applied to the market tends to have an impact on product costs, so the adopted MEPS regulation should always be aimed at being cost effective, and appropriate analyses need to be conducted for this purpose, including the requirements by other programmes and their impacts.

Many national MEPS programmes set a target of two to four years for updating MEPS, depending on the nature of the product. Thus, a roadmap for EE covering the range of products subjected to MEPS should be developed with the aim of revisiting the performance levels of products every two to three years to keep pace with technological and market changes.

In addition, the use of methods and definitions that reference international standards such as those of the International Electrotechnical Commission (IEC) for appliances and/or the International Commission on Illumination (CIE) for lighting equipment are also essential for both market monitoring and product testing in alignment with international and regional practices.

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[2] It is recommended that, when developing MEPS for lighting and other appliances, performance criteria for sustainability, quality, and safety be areas to be considered in addition to energy performance. By considering areas other than just energy performance for inclusion in MEPS, consumers are protected because well-made, reasonably priced, and energy efficient products are admitted to the market in a controlled manner.

[3] The full MEPS development process is referenced by a number of publications, including the UNEP Policymakers' Guidance Notes and its Tool Kit for Phasing Out Inefficient Lighting.

Figure 2-1: Detailed Steps in Developing MEPS for Products

Collect required data
- Information on the market, technology, engineering and usage of the product.

Cost-benefit analysis
- Determine the appropriate level of ambition for the regulatory measure(s).

Harmonization
- Harmonize test procedures with international protocols to facilitate testing and reduce barriers to trade.

MEPS setup
- Determine the technically feasible, economically optimal regulatory level.

Review and update
- Plan to periodically review and update the MEPS.

2.1.2   Product Labelling

Product labelling is a way to communicate information clearly and consistently to purchasers at the retail point of sale about product energy performance under typical conditions. Labels are usually affixed to products and they can contain a range of consumer information. Labels are typically grouped into three categories: (i) Endorsement (for example Energy Star®); (ii) comparative (for example the EU or China Energy Label); and/or (iii) informative (for example the Yellow Label in North America). It is commonly perceived as a good practice for existing labels to be adopted in a manner that minimises trade barriers and costs for manufacturers, especially where other labels or programmes exist.

Labelling can work in a complementary fashion with MEPS. They can be integrated with other policy instruments such as financial mechanisms or voluntary agreements that enhance their effectiveness. Successful consumer labelling programmes employ a combination of legal, financial, and social considerations, depending on the structure, economics, and culture of the society to which they apply. Most importantly, although labelling programmes are very helpful, they alone cannot transform the market.

Many countries also use voluntary labelling as a way to lead a market. In these cases, labelling programmes target high-performing products in the market using high energy performance standards (HEPS). These HEPS typically identify products that are in the top 10% or 25% of their category in terms of energy performance (for example, Thailand's No. 5 programme).

Figure 2-2: Mandatory/voluntary labels for (a) US Mandatory Lighting Label; (b) India Mandatory Appliance Label; and (c) China Mandatory Appliance Label (QR Coded)

| (a) | (b) | (c) |
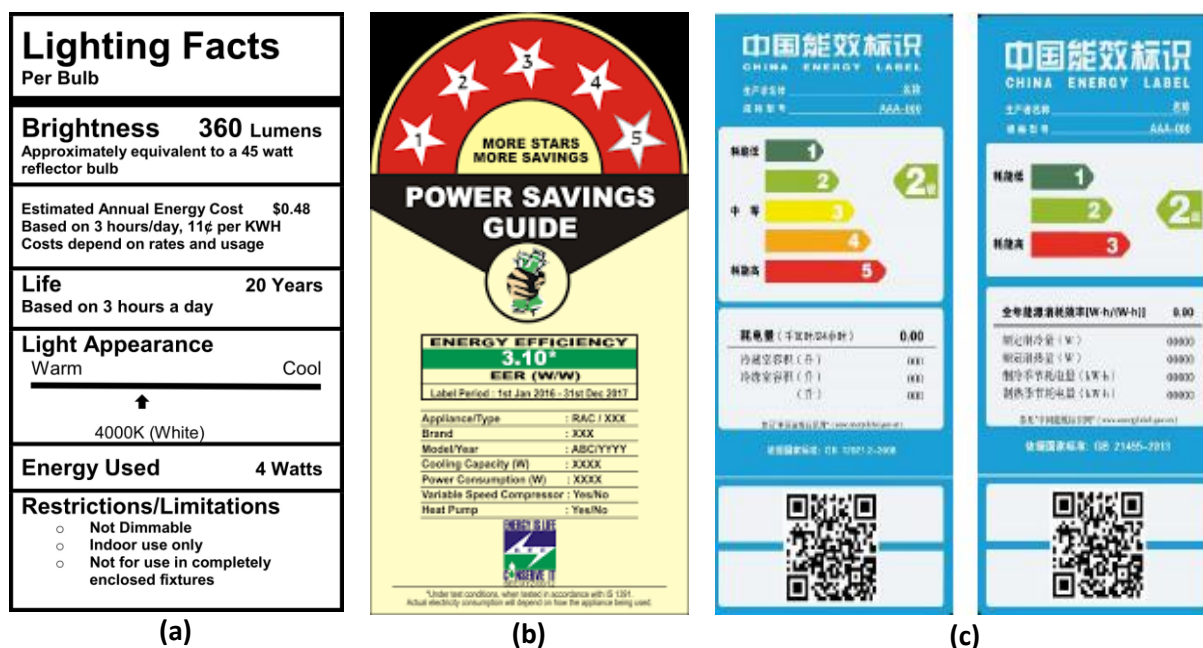
2.1.3   Integrated Policy Approach

It has been documented that an integrated policy approach is essential to successfully transform markets toward energy efficient products. This approach has been proven by programmes that phase out inefficient lighting in many countries. Integrated policy combines policies such as MEPS and product labelling with other policy actions such as monitoring, verification, and enforcement, consumer education, as well as financial incentives where appropriate. It is highly recommended that a communication and engagement campaign for consumers and other industries as well as government stakeholders be conducted well in advance of S&L enforcement to ensure a smooth transition. Moreover, all interested stakeholders should be involved in the programme design and standard setting stages.

3 Regional Alignment and Harmonisation for S&L

3.1 S&L Regional Alignment or Harmonisation: Overview

The term "harmonisation" is commonly used in international trade negotiations. The World Trade Organisation, other trade bodies as well as regional cooperation associations use the term to refer to the use of common product standards, test procedures, import tariffs, etc. to facilitate cross-border or international trades. Other organisations and trade partners, including the Asia-Pacific Economic Cooperation (APEC) for example, use "alignment," which in this context, indicates unilateral action by any member economy.

As discussed in the previous chapter, close alignment with market conditions, including regional or inter-border requirements can have a positive impact on market transformation by increasing product availability and reducing barriers to trade. At the same, a harmonisation of programme or adoption of common requirements across borders and region can enable meaningful product verification and enforcement actions. In addition, the use of methods and definitions that reference international standards such as those of the International Electrotechnical Commission (IEC) for appliances and/or the International Commission on Illumination (CIE) for equipment is essential for product testing, and form the basis for alignment with international and regional practices.

3.1.1 S&L: Market and Segmentation

MEPS and labeling guidelines used by S&L and market transformation programmes are typically developed and issued by national governmental agencies. Examples include the US Department of Energy (US DOE), and the State Administration of Quality Supervision, Inspections, and Quarantine (AQSIQ) in China. However, sometimes they are developed by regional authorities such as the European Energy Commission, or by state and municipal governments, such as those developed by State of California in the US.

The national and municipal agencies (where applicable) developing S&L policies are given the mandate, either by legislation or national decision, to regulate products for sales in their respective national markets. Typically, these agencies have no authority and little interest in regulating products intended for other markets. Therefore, there tend to be no drivers or natural focal points to promote harmonisation of appliance efficiency standards.

Many of the traditional appliances and even lighting products that have been regulated through MEPS typically have been designed and manufactured to meet regional or national demands and conditions. This localization can create localized factors that make it difficult to compare their performance relative to other products available on the international market. Two factors in particular deserve to be mentioned: the different usage habits (and appliance preferences) between regions, and the actual parameters (and test methods) used to measure the product performance.

An example of how usage habits and appliance preference can differ between regions and has contributed to the perception that harmonisation can be difficult to achieve, is found in clothes washing machines. In the US, clothes washing is divided into hot, warm, and cold wash cycles, while in Japan, clothes are typically washed in cold water, and most Europeans wash their clothes in hot water. In addition, US consumers prefer top loading machines while Europeans

prefer front loading machines. In Japan, the preference is also for top-loading machines, although both types exist. For an emerging country like China, which previously used and adopted Japanese products, both vertical and horizontal axes washers have become widely available, as European manufacturers expand their market, and Chinese manufacturers start to offer European style clothes washers. This posed an issue for standards authorities because the European type of horizontal axis washers were evaluated under an adopted version of the ISO testing protocol, while the other types were tested under adopted test versions of their home markets, thereby leading to inconsistent testing procedures to measure the energy performance of these two types of washers.

Figure 3-1: Examples of Clothes Washer Types and Applicable Test Standards in Each Region

Top Load	Front Load
JIS C 9811:1999 Japan	IEC 60456:1998 EU

However, for every example of products that can be difficult to harmonise for S&L, there are counter examples. Product characteristics are often similar among countries within a region, which can also ease harmonisation barriers. One example is the standards agreement for North America, where appliance trades take place among countries within a region. Trade flow patterns and regional agreements or cooperation pacts also offer logical guidance for regional harmonisation efforts, and can serve a common point for discussion and agreement.

Product categories that offer common usage preference and usage conditions include information technology, televisions, electric fans, and rice cookers, as well as other emerging products such as advanced water heaters. These products are promising candidates for harmonisation and/or alignment, given that their designs and performance specifications are more global in nature, compared to "legacy products" that are more determined by local taste. These categories offer opportunities to develop brand new and consistent global and regional testing protocols, as well as for the development of tiers of performance specifications that can be adopted by different countries according to their own market situation and regulation schedules.

Figure 3-2: Examples of Commonly Used Appliances and Applicable Energy Label

3.2   Rationale for S&L Alignment and/or Harmonisation

With respect to S&L, "harmonisation" is typically used to describe multilateral cooperation to establish uniformity in any aspect of S&L practices. On the other hand, "alignment" is typically used to describe the unilateral adoption of previously established test procedures, standards methodology or performance levels from an external source. It can also mean the adoption of labeling criteria or design from outside the country, for example, the EU energy or EnergyStar labels. This report follows this convention.

In general, most electrical products and appliances are subjected to national standards that specify minimum safety and performance requirements. Up to now, many countries have established and promote their national industrial or product standards. Thus, it is difficult and time consuming for a manufacturer, exporter, or importer to commission the necessary tests and obtain customs approval to import a product into many different countries. This costly and time-consuming customs procedures can amount to a non-tariff trade barrier.

Alignment and harmonisation of energy performance standards and programmatic details allow countries, suppliers, and importers to minimize the need for duplicative energy performance testing and for consumers to bear their additional costs. Alignment and harmonisation also allow for comparable energy and performance information within a product category, and within the affected region. International and regional trades also benefit in a reduction in these non-tariff related expenses. Consumer also benefit from having access to a wider market for appliances and other regulated electrical goods.

Therefore, the major goal for harmonisation of S&L is to maximize energy savings of appliances while reducing barriers to trade through a number of specific actions, including:

• Harmonising test procedures, as well as labeling requirements and energy performance standards where appropriate;

- Increasing transparency and reducing measurement, verification and enforcement needs through measures such as mutual recognition agreements (MRAs), product registry, and technical information exchanges, among others; and

- Simplifying and harmonising import/export processes, including customs procedures for covered products.

National energy standards-setting and labeling programmes are designed to influence the ways in which manufacturers of energy-consuming products produce, test, and distribute their products. Therefore, the harmonisation process facilitates the globalization of appliances, equipment, and lighting-products and offers an opportunity for countries to make their S&L programme requirements more stringent than they might otherwise be, while avoiding the "dumping" effect[4].

It should be noted that the harmonisation and/or alignment process is not entirely new to many countries. This is because most countries already have national agencies or institutions whose responsibilities include overseeing the development of safety testing and certification procedures for industrial and consumer products. These agencies certify the safety and performance of electrical and other regulated products and equipment using locally adopted safety standards by local technical committees.

Figure 3-3: Key Recommended S&L Best Practices
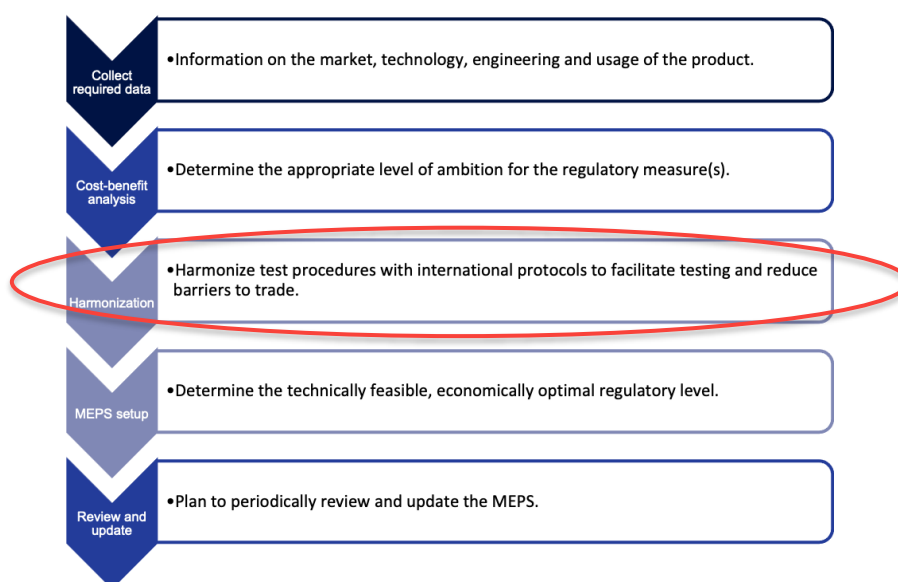
These adopted standards tend to align with international standards such as those developed by the International Organisation for Standardization (ISO), the International Electrotechnical Commission (IEC), or those developed for North America such as the Illuminating Engineering Society (IES) and ASTM. These safety and performance standards specify protocols for testing equipment performance, as well as minimum levels of safety.

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[4] Where inefficient or outdated products are imported into countries with the least regulations.

Figure 3-4: Logos of International Standards Organisations

In many cases, national test procedures tend to be harmonised closely with international test procedures in order to benefit from the reduction of non-tariff trade barriers. Yet, adopting established international test procedures for energy performance also has other useful benefits such as:

- Avoiding duplication of efforts: The development of product energy-performance test standards can be a complex and time-consuming process.

- Facilitating the test laboratory accreditation: The use of established procedures can simplify the proficiency testing process of designated test laboratories.

- Energy efficiency baseline: Locally available products' performance can be established and directly compared within the country as well as internationally.

3.3   S&L Alignment and Harmonisation Process

Depending on the extent of changes acceptable to the local technical committee or national agency, there can be varying degrees of harmonisation and alignment. Best practices for the development of international testing protocols address factors such as climate conditions as well as a range of possible operating conditions specific to certain use cases or locations. In cases where these are conditions that are not addressed, a country may adopt modified test conditions to reflect the local operating environment for a product, such as heat, humidity, or elevation, usually through the appropriate Technical Committee.

Recently, some countries have added requirements for testing of characteristics that are unrelated to performance or energy use (e.g., noise level for appliances, or blue light exposure for solid-state lighting) to ensure that performance trade offs are not made that can affect other elements of product operation and consumer comfort. Ultimately, it is the choice by each country how to design a minimum energy standards or labeling program and requirements, based on the locally available resources and expertise of the existing standards agency and other qualified bodies while leveraging available international best practices.

3.3.1   Aligning or Harmonising Labels

The incompatibility of test procedures and laboratory accreditation processes can create a more challenging issue and poses a much significant barrier to international trade than does the lack of harmonised labeling schemes for appliances and equipment. There is less evidence that a label used in one country or region would also be effective in other countries or regions, due to many factors, including cultural ones. It has been argued that an effort to harmonise all information on energy labels among several countries could reduce the impact of the label in each country because the optimal design elements of an effective label may be different in different cultures. Depending on the country and region, the symbols or graphic elements that work in one country may not necessarily transfer to another. For example, the star or scale rating can go from 1 to 5 or from 5 to 1 in terms of most efficient to least efficient. Even slightly different labeling requirements among nations can be disruptive to trade and can ultimately limit trade and increase costs to the consumers.

However, the recent harmonisation of the energy label among the EU's multitude of countries and languages has shown that it is possible to devise a unified label that can work across borders and cultures in a trade region. In fact, because of this effort, consumers in many countries that trade with the EU have been exposed to this energy labeling scheme. This exposure has resulted in consumers becoming more widely familiar with the concept of energy labeling, and the categorical information that they convey.

A successful example of labeling alignment is the US EPA Energy Star program. Launched in 1992 for computer monitors, it was later expanded to cover many other product categories. Products meeting the Energy Star requirements are recognized with the Energy Star logo, which identifies them as energy efficient products (top 10% of the market). The success of the Energy Star program in creating greater consumer awareness adoption of energy-efficient office equipment has attracted interest from government agencies around the world[5].

Thus, in the case of developing countries or regions with no existing labeling programme and modest manufacturing capacities for a particular energy consuming product category, the harmonisation of labeling could foster trade in a common regional market. For example, the ASEAN endorsement label that was developed for high efficiency lighting products is available for use by any products in the region that meet an agreed-upon threshold for "high efficiency". This initiative allowed smaller countries in ASEAN, or those that are not as far along in S&L development to avoid the need to develop a labeling program for certain products from the ground up by adopting this regional label.

When considering harmonisation of any aspect of a country's labeling program, separate consideration should be given to metrics and category definition, label appearance, the criteria for endorsement qualification, as well as the messaging. The benefits of harmonisation and the approach used to achieve it will vary. Any of the four elements may be harmonised or aligned as appropriate, but it is the criteria for endorsement qualification that will require testing and certification. It should be noted that extensive consumer research remains the key to determine which label design can be most effective and likely to influence consumers to purchase an energy-efficient product.

3.3.2 Aligning or Harmonising MEPS

S&L experts are in agreement on the benefits of standards harmonisation. It has also been asserted that effective product efficiency standards can help countries meet climate change objectives. This is because without coordination, a series of different product standards applied in the same trading region can have a significantly disruptive effect on commerce for both native and importing industries and considerably affects the region's energy saving potentials. Further, with climate change strategies becoming increasingly global, countries have been taking the harmonisation efforts more seriously. For suppliers, increased regional harmonisation can reduce costs for product design and testing while enhancing prospects for trade and technology transfer.

For developing countries, international standards that represent international technical consensus can be an important source of technological know-how. By defining the characteristics that products and services will be expected to meet on export markets, international standards can give developing countries a basis for making the decisions as to where and when to invest their scarce resources: to develop locally used standards, or to develop the capacity to use the standards locally. Thus, the harmonisation of standards has often been found to be useful, and more and more countries are discussing regional technical cooperation and programmatic development.

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[5] Currently, the EU, Japan, Canada, Australia, New Zealand and Taiwan have participated in the program

However, the harmonisation of MEPS must be both appropriate and effective. Furthermore, the IEA has argued that there is "a greater need for and net benefit to be gained from encouraging the development of 'regional' regulatory standards, rather than global regulatory standards, given the potential for different characteristics of products in each market". This is because, as discussed earlier, some products have universal application (for example, refrigerators) and thus can be tested by a common protocol, but other appliances' testing protocols are difficult to harmonise because their energy use can be heavily influenced by local or regional behavioral characteristics" (for example, washing machines).

The benefits of aligning or harmonising minimum energy-efficiency standards are important. But it is also important to note that the process of standards adoption or alignment also offers its own complementary benefits. This is because the standards deliberation process can delay some countries in implementing their own MEPS. Thus, harmonisation should offer the opportunity to shorten the development process, and for avoiding or delaying implementation of a labeling or standards-setting program. As the process of adopting standards may be shortened if the proposed standard is aligned with standards that exist elsewhere, it can help to justify the performance requirements[6].

Harmonisation of mandatory rules limiting the sale of inefficient products may require significant tact and diplomacy among trade partners and stakeholders, both within and among trading partners or member states. It should be noted that a country, or a group of trade partners may not find it practical or economical to establish minimum energy-efficiency standards that are harmonised with the energy-efficiency standards of large developed nations such as Japan or the U.S., but adoption of the scope and framework of existing MEPS should be considered, even if the energy performance requirements may be less stringent. This is because future iterations will also likely use the already harmonised framework. As a further advantage, harmonising energy efficiency standards for cooling products with those of large markets could mitigate the dumping of inefficient and environmentally harmful products.

In summary, adoption and/or harmonisation with existing standards and MEPS should only take place when:

- There are adequate supplies of energy-efficient products available in the country or region;

- The incremental cost of energy-efficient products is not excessive or high relative to average income in the country or region;

- A determination has been made on whether or not the local related industries can also benefit or not be adversely affected from the implementation of MEPS.

Finally, it should be noted that EELA is also supporting the development and harmonisation of minimum energy performance standards (MEPS) for room air conditioners and residential refrigerators (cooling products) in the EA-SA-IO regions. Harmonised MEPS across the regions will leverage the effect of the policies by reducing barriers to trade and enabling businesses to reduce costs. In addition, best practices and lessons learned on national implementation can be shared among the countries. It is anticipated that this effort will also help to drive the alignment and harmonisation of standards for other product categories for the region.

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[6] In some cases, it may be expedient to take a longer-term approach to alignment by first adopting an earlier version or available but less stringent version of an internationally accepted standard, with the intent to upgrade it to the current level in the near future.

4 S&L Policy Database Tool

4.1   S&L Policy Database Tool: Overview

Generally, for any given appliance or product category, a significant amount of data and analyses are required to establish a mandatory energy-performance standard, a voluntary standard, a comparison label, or an endorsement label. This is one reason that a government and the implementation agency might provide for expending resources in the initial stages of developing an S&L program. It is also a reason for considering the adoption of programmatic and standards requirements from another program or region.

To optimize the design and development of a labeling and/or standards-setting program, it is necessary to gather, organise, and analyze large amounts of diverse data, from both domestic and international sources. Two of the key tasks for the implementing agency in deciding whether and how to develop and implement energy labeling and/or minimum energy performance standards for a particular product category is to ascertain that it is possible to test the product's energy performance consistently, and what energy performance criteria exist regionally and internationally.

If a country chooses to proceed with adoption, alignment, or harmonisation with an internationally or regionally accepted program and/or requirements for a globally-traded product, far less analysis and expense are required to justify, for example the adoption of a standard that can potentially eliminate a significant number of products that are least energy efficient, compared to what would be needed to support a more location specific standard and programmatic requirements. An example of this is Australia's approach to developing minimum energy-performance standards, which is based on matching "world's best regulatory practice." Although the Australian approach uses international benchmarks as a basis for setting energy-performance requirements, many other variations are possible, such as alignment or harmonisation of requirements and/or standards with those countries in the same regional trade agreement, or with those of a major trade partner[7].

Central to countries' ability to use international best practices or benchmarks, or regional practices, is the ability to access and review current S&L practices and requirements easily, and to be able to compare them if necessary to identify best practices, as well as those are the most appropriate to their situation. Another important aspect of S&L development is to keep abreast of regional S&L development, or developments in those countries that are used as benchmarks or alignment targets. This function is best fulfilled by an international S&L policy database.

4.1.1   Evaluating the Types of Databases Needed for S&L Analysis

A multitude of energy-consuming products are traded internationally. Thus, it is useful for national agencies when proposing a new standard to at least consider reviewing and adopting (or aligning) with the applicable regulations from the exporting country. For example, minimum energy-efficiency standards for household refrigerators are in place in several parts of the world that also produce them, including North America, Europe, Japan, and China. As a result, refrigerators are priority candidates for energy-efficiency regulations by other countries, especially their trade partners.

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[7] Australia also works closely with the standards agency of one of its biggest trade partners: the China National Institute for Standardization.

National governments can conserve valuable resources and avoid having inefficient products "dumped" in their countries by examining existing regulations in other markets and adapting those regulations to their own national markets. As discussed earlier, when adapting existing regulations from other markets, the country doing the adaptation must consider and account for local user habits, infrastructure, and other influential factors.

Typically, of the data needed for MEPS development, the market, usage, behavioral and ancillary data are more specific to a locale, but the product-specific engineering and cost data are more useful when and if obtained from international manufacturers[8]. This is because they have the widest use cases, and can best optimize their products. Thus, while it may be initially desirable to have such information available regionally, especially for those belonging in a trading block or other cooperation agreements, it is also useful for regulators to look broadly, in order to have the most informed view on consumer trends and other technology developments for a particular product category.

4.2   International Survey of Energy Policy Tools

Recognizing the benefits of energy efficiency and the need for policy details as well as technical information access, many international organisations have developed a variety of accessible, on-line policy databases for a range of energy users, including those in the energy efficiency and renewable energy area. A close survey of these publicly available tools includes the following:

American Council for an Energy Efficient Economy: U.S. State Energy Efficiency Policy

This database from the American Council for an Energy-Efficient Economy (ACEEE) provides detailed information on a variety of US state energy policies, and is searchable by state, or by policy area. The American Council for an Energy- Efficient Economy also produces broad-scale comparisons of state policies and un-tapped opportunities. The ACEEE Database is updated at least once per year with data collected for the State Energy Efficiency Scorecard and City Energy Efficiency Scorecard. Users of the tool can submit their policy information to ACEEE.

Link: https://database.aceee.org/

CLASP: CPRC

The Collaborative for Labeling and Appliance Project's CLASP Policy Resource Center serves as a global hub for information on energy, water, and quality policies for on- and off-grid appliances and equipment. With respect to S&L polices, the database contains policy information that is collected directly from official government websites or from policymakers and reliable partners about the S&L policies. When available, policies in the CPRC database include a link to an official policy at the responsible agency. All policies are categorized according to Policy Instrument (MEPS or labeling), Policy Approach (mandatory or voluntary), and Product Type (categorization) with notes that detail any and all revisions.

Link: https://cprc-clasp.ngo/about

European Commission: Odyssee

The Odyssee-Mure project is co-ordinated by ADEME for the EU. It is supported by the H2020 programme of the European Commission and provide a list of energy and efficiency indicators. Its objective is to provide a comprehensive monitoring of energy consumption and efficiency trends as well as an evaluation of energy efficiency policy measures by sector for EU countries,

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[8] The data needed for labels and standards development can be put into five broad categories: market, engineering, usage, behavioral, and ancillary.

Norway, Serbia, Switzerland and the United Kingdom. The Odyssee indicators are accessible under different data tools: the full data base, the key indicators facility, as well as five specific data facilities that focus on specific issues and provide some interpretation: market diffusion, decomposition, benchmarking, energy saving and scoreboard. The access to the data base is restricted, whereas all other data tools are in public access. Odyssee's unique collection of historically based energy efficiency data enables to review and benchmark each European Union (EU) member's progress in terms of energy efficiency and to access energy consumption information by sector, end-use and impact on CO_2 emissions reduction.

Link: https://www.indicators.odyssee-mure.eu/energy-efficiency-database.html

International Renewable Energy Agency: IRENA

The IRENA's database tool helps analysts, policy makers and the public make informed decisions by providing access to comprehensive and up-to-date renewable energy data. IRENA publishes detailed statistics on renewable energy capacity, power generation and renewable energy balances. This data is collected directly from IEA members using the IRENA Renewable Energy Statistics questionnaire and is also supplemented by desk research where official statistics are not available. Renewable power-generation capacity statistics are released annually in March. Additionally, renewable power generation and renewable energy balances data sets are released in July. IRENA's statistics unit helps members to strengthen their data collection and reporting activities through training and methodological guidance.

Link: https://www.irena.org/

Indian Ministry of New and Renewable Energy: IREED

The Indian Ministry of New and Renewable Energy's Indian Renewable Energy and Energy Efficiency Database (IREEED) is a publicly available database that is a repository of all central and state government policies, incentives, and programmes related to renewable energy and energy efficiency in India. The development of IREEED was funded under the U.S.–India Energy Dialogue and the Clean Energy Ministerial, its website (IREED.org) was launched on September 20, 2013.

Link: As of October 2021, this website no longer exists.

Institute for Industrial Productivity: Industrial Efficiency Policy Database (IIP)

The Industrial Efficiency Policy Database developed by Institute for Industrial Productivity offers a users the ability to analyze policies according to a "policy pyramid" that connects various policies, measures and implementation tools together so that policymakers and others can best understand the total policy package in and across various countries. This structure is designed to help policymakers, think-tanks, and others to understand the mix and relationships in a total policy package that can be applied within and across various countries.

Link: http://www.iipinetwork.org/databases

International Energy Agency: BEEP

The International Energy Agency's Building Energy Efficiency Policies (BEEP) database is a global "one-stop shop" for buildings energy efficiency policies. The BEEP database was launched in 2012 as part of the work of the IEA's Sustainable Buildings Centre (SBC). It provides a detailed breakdown of policies for energy efficiency in buildings around the world. Users can access the database for effective policies being implemented worldwide, including buildings energy codes, buildings energy labels, and incentives schemes for training, technical assistance, and raising awareness.

Link: https://www.iea.org/policies

Organisation for Economic Cooperation and Development: PINE

The OECD's Policy Instruments for the Environment" (PINE) is a database gathering detailed information on policy instruments relevant for environmental protection and natural resource management. The database contains information on multiple types of policy instruments, and it covers more than 90 countries globally. PINE provides the same type of information for each policy instrument, structured into a large number of quantitative and qualitative variables. Its relational structure allows for the analysis of policies across different themes and its data are structured for statistical analysis. The PINE database covers 6 types of policy instruments for about 90 countries. For each policy instrument, the following details are provided:

- when it was introduced;
- what it applies to;
- the geographical coverage;
- the environmental domains it aims to address;
- the industries concerned;
- revenues, costs or rates;

Link: https://www.oecd.org/env/indicators-modelling-outlooks/policy-instrument-database/

UNIDO: Industrial Energy Efficiency Policy Database

The United Nations Industrial Development Organisation's Industrial Energy Efficiency Policy (IEEP) Database offers access to information on policy measures that have been implemented or planned to improve industrial energy efficiency at national level. The IEEP Database allows policymakers, energy analysts and advisors, energy entrepreneurs and investors, non-governmental organisations, international organisations and other users to explore information on the implementation, challenges and outcomes of industrial energy efficiency policy measures. At last count, the database included more than 250 policy measures from 40 countries.

Link: As of October 2021, this website no longer exists.

World Energy Council: Energy Efficiency Indicators

The energy efficiency indicators have been prepared by the World Energy Council (WEC) Committee on Energy Efficiency Policies and Indicators in partnership with the French Environment and Energy Management Agency (ADEME). The committee promotes and supports the development, introduction, and implementation of energy efficiency policies around the world, taking into account the international experience, including the evaluation of the impact of energy efficiency policies and measures on the actual energy efficiency performance of national economies, industries and other economic activities and various consumer groups. Approximately 30 energy efficiency indicators have been produced by main world region and WEC member countries.

Link: https://www.worldenergy.org/transition-toolkit/issues-monitor

4.3   Comparing Internationally Available S&L Database Tools

A publicly available data set on energy efficient appliance policies world-wide can have significant benefits for government officials, consultants, academic researchers, and others who are responsible for the development, alignment or harmonisation of standards. Access to such information allows for the design of programs, product performance standards, or labeling requirements based on common information and assumptions. Over time, a comprehensive

database would allow for an in depth understanding of the trends and potential for energy efficiency for appliances and equipment.

To provide useful information for S&L development, a policy database ideally should provide the following information regarding the existing policy:

- Product category/Sector: The most useful product categories and sector pertinent to the discussion herein would be the appliance and lighting product categories belonging to the consumer and commercial sectors;
- Scope of coverage: The scope and coverage of any particular product category would need to follow existing international definition, such as those defined by the IEC or CIE
- Testing methodologies or reference standards: The testing methodologies would also need to reference those that have been developed by the IEC, CIE, or other international testing organisation that have specific product expertise, including, for example, the ASTM (American Society for Testing and Materials)
- Testing conditions, if applicable
- Performance criteria/levels

In addition to the specific technical and policy details, to assist in the harmonisation or alignment process, a policy database should also provide the relevant overarching data, such as:

- Country
- Responsible agency
- Policy Type (MEPS or labeling)
- Policy Approach (mandatory or voluntary)
- Effective date
- Revision/Version/Date

Finally, as discussed, for such a tool to do the most good, it should be:
- Widely accessible
- Open or free to all users
- Provide the widest coverage of available S&L policies
- Allows for customization, searches, comparison of information both across many regions, as well as within a region.

Table 4-1: Available Tools and Features

Database	Accessibility	Number of countries covered	Policy Coverage	Type	Type of Search
CPRC (CLASP)	Open	Global (130 Countries)	Codes & Standards	Searchable Database	By Policy, Technology and Region
Odysee (EU)	Subscription Only	EU Member States	Efficiency Indicators and Consumption	Searchable Database	By Policy and Indicators
Industrial Efficiency Database	Open	Global	Industrial Efficiency Policies	Searchable Database	By Policy, Technology and Region
BEEP (IEA)	Subscription Only	Global (90 Countries)	Energy Policies	Searchable Database	By Policy and Technology
PINE (OECD)	By Invitation Only	OECD Countries	Energy Policies	Searchable Database	By Policy and Technology

5 Summary and Recommendations

5.1 Summary and Recommendations

Many countries in the EA-SA-IO Regions are working to introduce and implement energy efficient S&L policies. Some countries are further along this process, while others have just begun. Internationally, implementation of S&L policies share a number of key success factors, including programs and requirements that best suit their current market situation and conditions. However, it is also important that MEPS and labeling requirements align or harmonise with international best practices, progression, as well as regional practices and requirements where possible and practicable in order to maximize impacts, reduce barriers to trade as well as development time, and improve compliance success.

As national standard and label programs multiply and global trade in appliances continues to grow, standard harmonisation efforts will gain more momentum. There are clear benefits to manufacturers, consumers, and national government agencies in charge of standards development in reducing trade barriers, increasing trade flows, and promoting higher energy efficiency. Harmonisation of appliance standards and labels could take a variety of forms: harmonising testing procedures, mutual recognition of test results from accredited testing laboratories, harmonising the performance standard levels and energy labeling criteria, and full harmonisation of programmatic and/or technical details. All of this is only possible if countries have access to reliable, up to date S&L information, and the need and desire to work together.

Based on the survey of available databases and their functionality, it is clear that the CLASP Policy Resource Center (CPRC) is the most useful tool for countries in the EA-SA-IO regions who are seeking to obtain the most current and useful information for the development of their S&L policies and to incorporate, align or harmonise with international and regional practices. The CPRC serves as a hub for information on energy efficiency as well as quality policies for consumer and commercial appliances and equipment available in the EA-SA-IO member countries. This comprehensive database is designed to facilitate agencies' need to view, compare, and download data to support policy development, product prioritization, and other technical analyses needed for S&L. Furthermore, the CLASP Policy Resource Center (CPRC) is a freely available digital tool, and is currently the most comprehensive global policy platform.

While it is global in scope, the CLASP's CPRC also allows users to develop customizable, aggregated lists of policies, such as policies for a particular product category, in the same region, or both. This ability to customize makes the CPRC easy for policymakers and S&L practitioners to explore efficiency policies from countries around the globe, within a region, or examine individual policies in more detail, thus enabling them to make internationally and regionally informed decisions.

The use of this database in place of one developed specifically for the regions can eliminate the typically lengthy time required for development, testing and modification, as well as the resources required for regular updates. Without the development and testing as well as regular updates, such a tool would be static and dated in a short time, placing its usefulness in question. With the CLASP tool, this would not be an issue. Even if the tool is not specifically owned by the member states, it is freely available, and CLASP's historical track record with such tools indicate that it will be supported for the long run. It also has additional topics such as water, and off-grid appliances that would be useful for EA-SA-IO countries when they are ready to address these additional product areas.

This tool is also on an expansion path in terms of features and content. CLASP has indicated that it will update the CPRC by country every 6-18 months and make ad-hoc updates as soon

they become aware of policy changes. Users can submit updates to CLASP and subscribe to receive CPRC updates and news (e.g. new features and events) from CLASP every 1-2 months. With its customization features, it can help those responsible agencies in the EA-SA-IO regions track S&L related activities and be informed of S&L developments in this diverse region, thereby helping their work and benefitting these regions.

Finally, CLASP conducts frequent and thorough research to maintain the CPRC. All policy information featured in the database is collected directly from official government websites or from policymakers and reliable partners.

Appendix A Users' Guide to the CPRC

Version 1.0

1. CPRC Overview

The CLASP Policy Resource Center (CPRC) is a comprehensive database containing S&L policy information from over 120 countries and 14 different product groups. It is designed to support policymakers and S&L agencies by allowing them to view, compare, and download data to support policy development, product prioritization, and other technical analyses. It is a free web-based tool available to anyone with internet access.

It can be found at: https://cprc-clasp.ngo

The CPRC began as the CLASP Standards and Labeling (S&L) Database and was launched in 2000 as a collaborative effort among the founders of CLASP (the Alliance to Save Energy, the International Institute of Energy Conservation, and Lawrence Berkley National Laboratory). Together with the first edition of the S&L Guidebook, the CLASP Database was one of the pioneering tools that provided S&L stakeholders with information on energy efficiency policies by country, the types of policies, and which products the policies covered. The database initially contained policies from 32 countries.

Figure A- 1: The Clasp Policy Resource Center Website
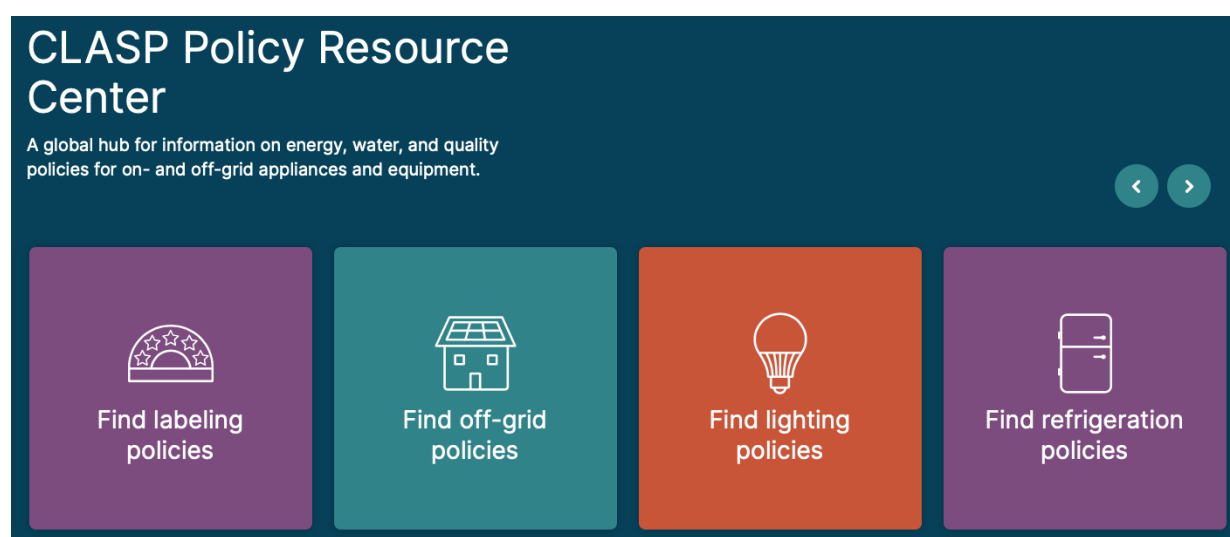
In 2004, the CLASP S&L Database merged with the Asia-Pacific Economic Cooperation (APEC) Energy Standards & Information System (ESIS) and became a single web-based tool, covering 21 APEC and 24 non-APEC economies. From 2011 to 2016, CLASP continued to increase the scope of the database by adding new countries, products, and features. Usage of the database expanded, and it informed numerous country and international analyses on the state of world-wide standards and labels policies. By 2019, with various philanthropic support the database covered 92 economies, reflecting the increase in adoption of standards and labels globally. It was also expanded to cover off-grid appliances.

In June 2021, CLASP launched the newly revised CLASP Policy Resource Center (CPRC), which houses over 1400 policies across over 120 economies. The CPRC currently covers energy and water efficiency policies for on-grid products, as well as quality standards for off-grid products. It also features expanded functionality, including policy database updates for subscribers, and refined search tools.

2. CPRC Methodology and Usage

2.1 Methodology
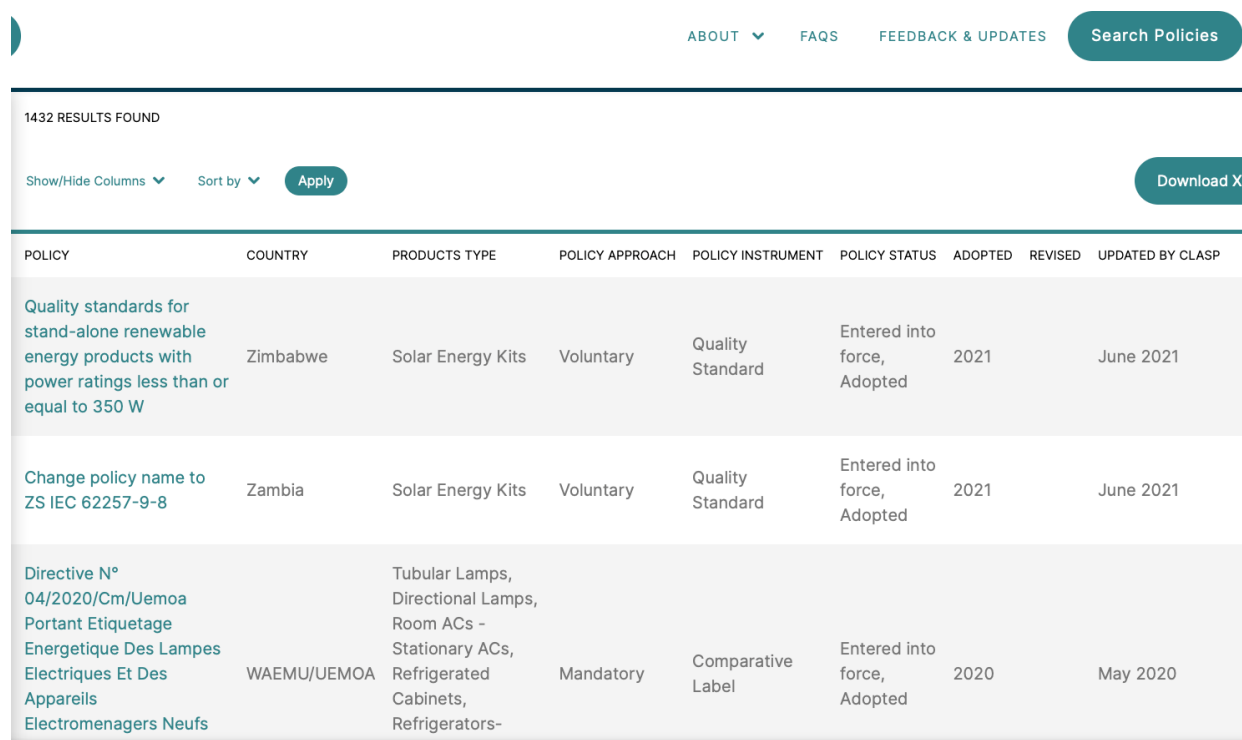
In order to maintain the CPRC and keeping it current, the CLASP team conducts frequent research and survey S&L stakeholders. All policy information in the database is collected directly from official government websites, policymakers, or reliable partners. Most policies contained in in the CPRC database include a link to an official website. Where publicly available information is not available other references such as presentations, websites, or specify the absence of such information in a note on the policy detail page.

Users can look for policies in the CPRC database in three ways:

1. Pre-selected Search Based on Key Topics: Users can search by topics, which are grouped by product category or policy area. The Policy Search table contains the filters corresponding to the selection applied.

2. Targeted Search: Users can use the Policy Search page with the appropriate filters to refine the search by Geography, Products Covered, and others.

3. Using Key Words: You can use the magnifying lens button in the top right corner of any CPRC page to search the whole CPRC website. The search function is helpful if you are looking for specific key terms, or to see if the CPRC covers a topic of your interest.

The Refining Search Results page provide tips and additional guidance for users. An example of the search page is shown below.

Figure A- 2: An Example of CPRC Search Result

2.2 Usage

Refining Search Results

Users can view any policy in more detail after the locating them through the Policy Search by clicking on a Policy Title to visit the Policy Detail page for the policy of interest. The Policy Detail pages contain all the available information related to each policy, including the information available in the search results table and more. An example of the Policy Details for Algeria for lighting is shown below[9]:

Figure A- 3: An Example of CPRC Search Result

Using Filters

Users can filter their searches using a range of filters, including by:

- geography,
- product category,
- policy instrument,
- policy status,
- policy requirements
- fuel types, and
- related topics.

Below are examples of some of the filters available.

> **Note:**
> **For EA-SA-IO users, they can set the Geographic filter for all of Africa, or a subset of the EA-SA-IO member countries for these searches, and also for receiving updates about policies in the region.**

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[9] For policies in the U.S., Samoa, Vietnam, and Singapore that cover multiple products with differing information (i.e., adopted and revised dates), you can find a Product Status table at the bottom of the parent policy's Policy Detail page.

Figure A- 4: An Example of CPRC Search Result

3. Using CPRC Results for Analysis

Users can save the results of CPRC searches on their own devices in order to conduct further analyses as needed. Results are saved as MS Excel files for ease of manipulation. Users can download their search results in two ways:

1. Download search results from the Policy Search table: Users can download search results in .xlsx format from the Search Policies page by clicking "Download XLSX".

2. Download information from the Policy Detail page: Users can also download details in .xlsx format for a single policy.

Example of a downloaded search result in .xlsx format:

Figure A- 5: Downloaded Search Results in .XLSX format

CONTACT INFORMATION

Suite 201

First Floor Warrens Court

48 Warrens Industrial Park

Warrens

St. Michael, Barbados

T - +1-246-622-1783

hello@cpcs.ca

www.cpcs.ca

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