Asia-Pacific Economic Cooperation

Reducing Trade Barriers for Environmental Goods and Services in APEC Economies

Mapping Exercise for Energy Efficient Products

Final Report

January 06, 2011

Submitted to:

Asia-Pacific Economic Cooperation (APEC)
Expert Group on Energy Efficiency and Conservation Energy Working Group

Submitted by:

ICF International (Beijing)
Prosper Center
Tower 2, Suite 1501
5 Guanghua Road
Chaoyang District
Beijing 100020, CHINA

In partnership with:

China Quality Mark Certification Group
Product Certification Co., Ltd
No.33 Zengguang Road
Haidian District
Beijing, 100048 P.R.

APEC Project EWG 01/2010T

Produced by
ICF International (Beijing)

For
Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

APEC#211-RE-01.1

Reducing Trade Barriers for Environmental Goods and Services in APEC Economies

Mapping Exercise for Energy Efficient Products

Final Report

January 06, 2011

Prepared for
Asia-Pacific Economic Cooperation (APEC)
Expert Group on Energy Efficiency and Conservation Energy Working Group.

Prepared by:
ICF International
Prosper Center
Tower 2, Suite 1501
5 Guanghua Road
Chaoyang District
Beijing 100020
P.R. China

Table of Contents

1. Executive Summary

Many international experts agree that energy-efficient product standards and labeling (S&L) are an important tool and policy mechanism to reduce greenhouse gas (GHG) emissions by requiring or promoting manufacturing and sales of more energy-efficient products. With rapid globalization, more and more energy-consuming products are traded among AEC economies. The APEC EGS (environmental goods and services) Work Program has identified decreasing trade barriers of environmental goods and services among APEC economies as a meaningful way to contribute to economic growth and reduce GHG emissions. With this objective in mind, APEC commissioned this study.

This report provides a preliminary analysis of divergence and convergence among APEC economies with regard to energy-efficient product standards and labeling (S&L) and testing and measurement procedures. The objective of this effort is to analyze the divergence and convergence of energy efficiency standards and labeling across select product categories to identify opportunities for harmonization efforts that will facilitate trade among member economies.

Unlike some of the broader policy analysis on harmonization of international and regional energy efficiency standards and labeling, this study is primarily focused on analyzing the current energy efficiency standards convergence and divergence of seven product categories, and provides specific analysis and recommendations for those product categories. Therefore, it is not a comprehensive analysis on strategies and policies for regional harmonization of energy-efficient standards and labeling.

The Mapping Exercise investigated seven widely-traded product categories: air conditioners; refrigerators & freezers; domestic & commercial lighting; computers & monitors; televisions; clothes washers & dryers; and water heating. S&L efforts for these products were researched in APEC's twenty-one member economies.

Section 2 of this report details the objectives and relevance of the study with regard to APEC's priorities, including confronting significant non-tariff barriers to trade. Through extensive desk research and telephone and email interviews (as needed) for each APEC member, this study analyzed the varied mandatory, voluntary, and labeling schemes for each APEC economy. Section 3 includes profiles of each economies' S&L programs, and each profile includes a description of the economies' energy efficiency standard and mandatory label, voluntary label, test procedures, and evidence of harmonization with international standards.

Cross-economy product comparisons were investigated for each product, focusing on synthesizing convergence of S&L efforts, including comparison of test standards used by member economies, the varying levels of energy efficiency and how it is measured by each economy, and recommendations for using identified convergence to inform future efforts to harmonize standards. These comparisons are featured in Section 4.

This report presents both a narrative of detailed S&L technical characteristics, as well as visual comparisons via matrices and tables. As part of the Mapping Exercise, a variety of key findings emerged, including commonalities between economies in the level of compliance that is emphasized (mandatory versus voluntary); the degree to which international test standards are adopted or referenced; and the existing level of convergence and harmonization between economies. Section 5 presents action-oriented recommendations based on the key findings of the Mapping Exercise.

Overall, this report acknowledges that energy efficiency standards among APEC economies vary widely and are often difficult to compare due to differences in test standards, product scope, and definition of energy levels. Mutual recognition and/or harmonizing of energy efficiency standards across all APEC economies may present obstacles due to differences in domestic energy policies,

level of economic development, specific product development, and funding availability and capacity in S&L program development.

2. Background and Context

2.1. Introduction

Most APEC economies have mandatory minimum and/or voluntary energy efficiency standards for key consumer and other products, which must be met by manufactures before products are sold in the economy. These energy efficiency standards set expectations for more environmental-friendly products that use less energy and therefore indirectly reduce greenhouse gas (GHG) emissions released during the manufacturing process. Many of these economies work independently to establish national policies and standards, without consideration of other global perspectives (APEC, 2006, 11). Differing standards create barriers to trade and require higher costs for trading among APEC economies. Divergence of standards creates burdens to businesses of environmental goods and services (EGS) because their products must be manufactured in compliance with the unique specifications of each economy. Likewise, equipment importers may lack confidence that foreign energy- efficient equipment will meet the standards of their home economies, and trade of energy-efficient equipment suffers.

This divergence of standard and testing requirements has become a significant non-tariff barrier (NTB) to trade. At an EGS Workshop in Singapore on July 28, 2009, participants noted that NTBs such as standard-setting and certification issues may be more relevant than tariffs in promoting greater trade of energy-efficient products (APEC, 2009, 1). Furthermore, NTBs that prevent the uptake of energy-efficient products in global markets limits the potential for economies' climate change mitigation and sustainable growth potential.

Alignment, or harmonization, of various standards and test methods for EGS among APEC economies could contribute significantly to the promotion of regional economic trade and increase support for global environmental goals. Benefits of alignment include: greater market transparency; reduced industry compliance costs; improved conditions for technology transfer; and reduced design, implementation, and compliance costs for economies, particularly developing economies (Collins, 2009, 4). A key outcome of successful alignment is reduction of barriers to trade and enhanced market access.

Currently, each economy can list their standards on the APEC-ESIS (Energy efficiency standard Information System) website (http://www.apec-esis.org/). The website is a useful tool that serves to:

- Provide up-to-date information about appliances and equipment energy efficiency standards and regulations;
- Link users to information related to standards and regulations being used by APEC and other economies;
- Provide a regular newsletter with a listing of new and proposed standards in the region (APEC Standards Notification Procedure); and
- Host "Communities of Practice" for experts and officials to discuss harmonization efforts and rationalize the testing, labeling, and minimum energy efficiency standards for specific appliances and equipment.

The website could be improved by aggregating this information in a way that allows users to more easily identify the most common standards and specifications and stay abreast of new and evolving technologies.

By developing a comprehensive matrix of key energy-intensive appliances used in APEC economies, via this mapping exercise, we have 1) identified which economies have introduced or are planning to introduce standards and labels for specific products; 2) assessed how convergent or

divergent the energy-efficiency standards, labeling, and testing and measurement procedures are among APEC members; and 3) determined the international standards (and versions of international standards) each economy's standards align with.

Given the results from the mapping exercise, it is possible to identify areas where testing methods of energy-efficient equipment are convergent and harmonization efforts can be focused within the region. The benefits of increased harmonization are twofold: first, it will help businesses determine the most appropriate standards to align with and facilitate trading of energy-efficient products by reducing compliance costs to industry. Secondly, it will give importers greater confidence about the efficiency of foreign equipment, thereby encouraging trade in EGS, reducing energy use and related carbon emissions. This Mapping Exercise also provides focal points for government officials to consider for harmonization and alignment of standards, labeling and testing, and measurement procedures.

This report outlines the collaborative efforts among relevant APEC groups with regard to standard-setting and certification issues and provides practical guidance for follow-up actions to reduce NTBs and strengthen benefits associated with EGS.

2.2. Relevance to APEC Priorities

In November 2009, the APEC EGS Work Program was endorsed by Ministers who agreed to undertake "work to address non-tariff barriers and enhance market drivers to environmental goods such as explore greater harmonization and convergence of standards, particularly in the area of energy efficiency". APEC Leaders also agreed that 'a key thrust in APEC's sustainable growth agenda is the APEC EGS Work Program, under which we will develop and implement a set of concrete actions to support sustainable growth in the region, advance work to increase utilization and dissemination of EGS, reduce existing barriers and refrain from introducing new barriers to trade and investment in EGS, and enhance capabilities of economies to develop their EGS sectors'. This mapping exercise serves as one of the mentioned 'concrete actions to support sustainable growth in the region.'

In 2009, leaders also agreed that in 2010, "a comprehensive long-term growth strategy that supports more balanced growth within and across economies, achieves greater inclusiveness in our societies, and sustains our environment" would be put in place. Based on this Leaders' agreement, Japan, host economy of APEC 2010, has assumed "growth strategy" as a main priority (EGEE&C, 2010, 3). This mapping exercise is developed as an information tool to identify ways with regard to standards, labeling and testing and measurement procedures for supporting the EGS sector in the APEC region.

2.3. Objectives of the Mapping Exercise

The objective of this mapping exercise is to address non-tariff barriers (NTBs) with regard to energy efficiency standards, labeling, and testing procedures vis-à-vis key electric appliances by analyzing their convergence and divergence among APEC economies with updated information contained in the APEC Energy efficiency standards Information System (ESIS) database. The project aims to help reduce business compliance costs of adapting manufacturing processes and in-house testing to widely varying efficiency standards and testing practices across the region, and thereby to increase trade and investment in energy-efficient products.

This mapping exercise will:

- recommend actions for reducing NTB for environment goods, including harmonizing energy efficiency standards, labelling, and/or test methods for applicable products.
- provide best practices for economies to adopt energy efficiency standards and labelling programs.

These recommended actions aim to reduce business compliance costs of adapting manufacturing processes and in-house testing to widely varying efficiency standards and testing practices across the region, and help to produce energy savings and indirect benefits, such as improved productivity and mitigation of climate change impacts in the region, by reducing barriers to trade and investment in EGS (specifically energy-efficient products). Identifying best practices and providing focal points for action will assist APEC members in achieving the goals of the EGS Work Program and develop policies that increase the availability of energy-efficient products in the region.

2.4. APEC Fora Relevant to this Project & Target Audience

This project is proposed and implemented under the EGEE&C (Expert Group on Energy Efficiency and Conservation), and its synopsis was endorsed by EGEE&C in October 2009 and then by EWG with the highest ranking among EWG Trade and Investment Liberalization and Facilitation (TILF) proposals, in November 2009.

This project provides opportunities for other APEC fora to study this mapping exercise and apply relevant learning so that the mapping exercise could be consistent with the APEC-wide initiative on development of EGS sector.

Relevant fora involved for consultation are CTI, MAG and SCSC (EGEE&C, 2005, 10):

- **CTI (Committee on Trade and Investment)** has taken leadership in addressing Leaders' instructions with regard to EGS, including by developing an EGS work program as a contribution to APEC's broader objective of promoting sustainable economic growth in the region. This project, as one of the EGS projects undertaken this year, is consulted and reported to CTI.

- **MAG (Market Access Group),** with a focus on tariffs and non-tariff measures (NTMs), is also a relevant fora to be consulted. MAG held the Workshop on Environmental Goods and Services (EGS) in Singapore on July 28, 2009 (CTI32/2009T) with participation of SCSC Convenor and Chair of EGEE&C. At the Workshop, participants noted that NTBs such as standard-setting and certification issues may be more relevant than tariffs to promote greater trade in energy-efficient products, and that different testing standards for energy efficiency among different markets would cause high cost for manufactures, and agreed that collaboration among relevant groups is necessary. This 'mapping exercise' is exactly relevant to the outcomes of the MAG Workshop, and thus has been of great interest to MAG members. Progress of this project was reported at the MAG meetings this year.

- **SCSC (Sub-Committee on Standards and Conformance)**, a forum that aims to reduce the negative effects that differing standards and conformance arrangements have on trade and investment flows in the Asia-Pacific region. Progress of this project was reported at SCSC meetings this year to seek input from experts on standards and conformance. SCSC held a Conference on Standards and Conformance for Green Harmonization (CTI44/2009T) as a joint project with EGEE&C, in the margin of third Senior Officials' Meeting (SOM 3) in September, 2010, in Sendai, Japan. The Conference aimed to share information on energy efficiency regulation systems among government, and business and international organizations, experts on standards, conformance and energy efficiency policy were brought together to discuss the progress of this 'mapping exercise.' Feedback was received from experts at the conference.

The key audiences for this report include:

- The APEC EWG/EGEE&C and the relevant APEC fora;
- Government officials in APEC economies who engage in energy and trade policies, especially energy efficiency standards, labels, and testing procedures;

- EGS businesses who wish to obtain information standards, labeling and testing procedures currently adopted in each APEC economy and manufacturers of traded products who are seeking the most appropriate standards for their potential market.

2.5. Project Methodology

During consultation with the EWG/EGEE&C Secretariat, the project team implemented the following steps to conduct the Mapping Exercise:

1. Conducted desk research of existing literature on the current status of energy efficiency standards and labeling in APEC economies and barriers and opportunities for international collaboration.

2. Conducted desk research on each APEC economy, including of energy efficiency standards, labeling, and testing and measurement procedures currently adopted or proposed for adoption in each APEC economy for selected appliances, and analyzed the international standards with which they are aligned. After the research, the team assessed knowledge gaps on the ESIS website and updated the website. This step facilitated the completion of Step 3 below and also added value to the ESIS website as an ongoing information source. Selected energy-using products for this project include:

- Air Conditioners
- Refrigerators & Freezers
- Domestic & Commercial Lighting
- Computers & Monitors
- Televisions
- Clothes Washers & Dryers
- Water Heaters

The selected appliances are consistent with the priorities of the EGEE&C, the International Energy Agency (IEA) (including the IEA Mapping and Benchmarking Annex), and the International Partnership for Energy Efficiency Cooperation (IPEEC) Super-efficient Equipment and Appliance Deployment (SEAD) project. There are however many other energy-using products which are of importance from the perspective of potential to reduce energy consumption, including LED and electric vehicles. Study on these products might be useful too, if necessary in the future.

In order to facilitate efficient survey administration, the team developed a template form for each APEC economy requesting the following key information:

- Full title of the standard/label
- Year of publication/Effective Date
- Version number
- Scope of products and modes of energy use covered by the standard
- Reference standard title, year of publication, and version number
- Number of manufacturers registered and number of models registered
- Revision and development plan

Most information was collected from government websites. If online information was insufficient, the team would send email requests to S&L experts in those economies or make phone calls to get as much information as possible. The APEC-ESIS website was used to direct the team to additional economy contacts and to double-check the sources of our information.

3. Developed a matrix for each economy that demonstrates the status of the economy's current standards and labels and its plans for revising older standards and developing new ones. The summary also analyzes its tendency for harmonization with international standards and information

availability.

4. Developed a cross-economy matrix for each selected product category that demonstrates the proportion of economies in the region that have introduced or are planning to introduce standards for the product; how convergent and divergent energy-efficiency standards, labeling, and testing and measurement procedures are among APEC members and the international standards and versions with which they are aligned.

The analysis compares standards & labeling, testing and measurement procedures, product scopes and levels of energy efficiency among the APEC economies and also compares these with international standards.

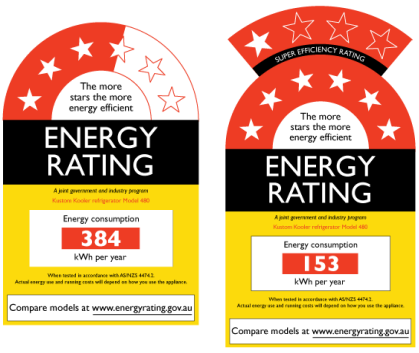
5. Conducted telephone & email interviews as necessary to collect additional information and obtain experts' opinions on harmonization. The team utilized contacts from previous and on-going energy efficiency standard collaboration projects with APEC economies and additional APEC contacts.

6. Developed key findings from the survey process and interview responses. The team reviewed full sets of economy and product summaries and all interview notes. After a team discussion, a final list of "Key Findings" was developed.

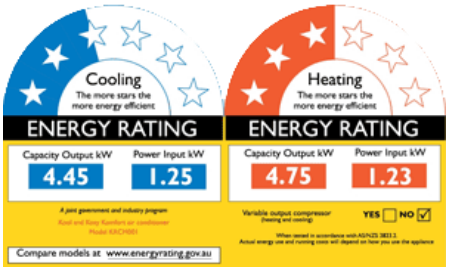
7. Developed key recommendations, including how APEC can disseminate and increase utilization of environmental goods and services through promotion, adoption, and alignment of standards, labeling, and testing and measurement procedures. The team also recommended priorities for action, i.e., where to focus efforts to increase the uptake and alignment of standards in the region for the selected appliances.

8. Developed this preliminary report. The report provided an overview of energy efficiency standard and labeling status for each APEC economy and for each product. In addition, the report analyzed how convergent and divergent energy efficiency standards, labeling, and testing and measurement procedures are among APEC economies and how APEC economies compare to international standards.

9. Developed a final report based on results from Task 1-9. The team reviewed feedback received from stakeholders in response to the draft report and made revisions to the report accordingly.



New energy rating label with crown



New side-by-side air conditioner

Voluntary Label-ENERGY STAR

3. APEC Economies Energy Efficiency Standard and Labeling Programs Overview

This chapter summarizes the current status of each APEC economy's S&L programs and its plans for revising existing programs and developing new ones. It examines each economy's alignment with international standards as well as its information availability. Most information on

standards, labels and test methods for each economy was collected from its government website, with additional details obtained from telephone and email requests. Please refer to the links under each economy's overview section for the implementation agencies and contact information. The APEC ESIS website also provides active economy contacts for additional information. Full economy summary matrices are attached in Appendix A.

3.1. Australia

Energy Efficiency Standard and Mandatory Label

Australia works with New Zealand on the Equipment Energy Efficiency (E3) Program, which focuses on increasing the energy efficiency of high-energy consuming appliances and equipment, and promotes the purchase of efficient models across the residential, commercial and industrial sectors, through the use of Minimum Energy Performance Standards (MEPS) and Energy Rating Labels (ERLs).

As of November 2010, the E3 Program included 22 different products in the residential, commercial and industrial sectors. Seventeen of these products have mandatory MEPS, seven products have mandatory ERLs, two products have voluntary labels, and two products have high efficiency performance standards (HEPS). Five of the 22 products have both mandatory MEPS and labels. Twelve products are at various stages of regulation.

Televisions are an example of an electrical appliance currently regulated with MEPS and ERLs, which were introduced on 1 October 2009. Computers and computer monitors are an example of products currently being considered through a consultation regulatory impact statement.

Voluntary Label

Australia adopted ENERGY STAR® from the United States (US) as its voluntary product label. Australia has voluntary ERLs for three phase air conditioners and swimming pool pumps. Australia has adopted a high energy performance standard (HEPS) for distribution transformers and three-phase electric motors.

Test Procedures

Australia is committed to adopting international test methods. An active program is underway to transition products that have been regulated using Australia and New Zealand standards to international standards.

Harmonization with International Standards

Australia is moving toward adopting international test methods and standards. There are some products, including televisions, that are currently using international test standards.

Information Availability

Australia has an official website (http://www.energyrating.gov.au/) for the E3 Program with regularly updated information, including development trends and study reports. A website for the Australian ENERGY STAR program is also available.

Source:
Mandatory MEPS and ERLs: Department of Climate Change and Energy Efficiency, http://www.energyrating.gov.au/
ENERGY STAR Label: Department of the Environment, Water, Heritage and the Arts, http://www.energystar.gov.au/

3.2. Brunei Darussalam

Energy Efficiency Standard and Mandatory Label

Currently, no energy efficiency standard and mandatory label exists in Brunei Darussalam.

Voluntary Label

Energy labeling for domestic appliances in Brunei Darussalam is at the preliminary stage, and will be implemented on a voluntary basis (with a focus on air-conditioners). It has been proposed that efforts will be extended to refrigerators, water heaters, and other electrical products at a later stage.

Test Procedures

Not applicable.

Harmonization with International Standards

Not applicable.

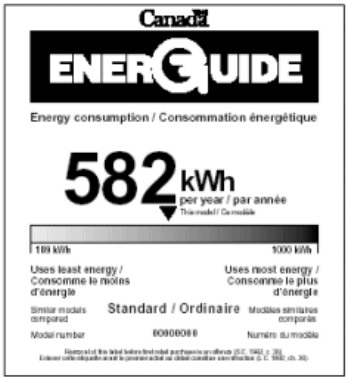
Information Availability

The official website of the Energy Division, Prime Minister's Office, the lead for energy labels and standards program, has relevant standards and products information.

Source:
Voluntary Label: Energy Division, Prime Minister's Office,
http://www.energy.gov.bn:81/index.php?option=com_content&view=article&id=238&Itemid=89

3.3. Canada

Energy Efficiency standard and Mandatory Label



Mandatory Label- ENERGUIDE

Canada has national mandatory energy performance standards for almost all products except computers and monitors. Some product types are divided into a number of subcategories, such as air conditioners, refrigerator & freezer, lighting, and water heating. Each subcategory has a corresponding standard. Most mandatory standards, except for water heating and some lighting products, require an EnerGuide label to be attached to the product. All of Canada's mandatory standards have existed for over a decade and many of them (i.e. TVs, clothes washers, ceiling fan lighting, torchieres, and commercial refrigerators) were updated within the last three years. Canada is currently revising its requirements for room air conditioners.

Voluntary Label

Voluntary Label-ENERG STAR

Canada has adopted ENERGY STAR from the US as its voluntary label. A significant number of manufacturers have developed models that meet the voluntary levels. Although Canada lacks mandatory requirements for computers and monitors, it has voluntary labels for these two products. No voluntary labels are available for clothes dryers and certain subcategories under Air-Conditioning (AC) and lighting.

Test Procedures

Canada has developed its own test methods for most of its mandatory and voluntary requirements. Its mandatory standards for commercial refrigerators and general service lamps follow American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), Illuminating Engineering Society of North America (IESNA), and International Commission on Illumination (CIE). Under ENERGY STAR, US EPA test methods are adopted for refrigerators & freezers, lighting products, and computers & monitors. IEC is referenced for TVs.

Harmonization with International Standards

Canada's standards and testing procedures reflect a low level of harmonization. International test standards are used for only a small number of products. However, Canada has adopted ENERGY STAR from the US as its voluntary label and EPA methods for testing, which shows a tendency to harmonize energy efficiency standards with its major trade partner.

Information Availability

Canada has detailed information and clear instructions on its official website regarding the standard/label and future revision plans. Users can search for specific manufacturers and models that have passed mandatory and voluntary levels.

Source:
MEPS & Mandatory Label: Office of Energy Efficiency www.oee.nrcan.gc.ca
Voluntary Label: Energy Star in Canada, Office of Energy Efficiency
http://www.oee.nrcan.gc.ca/energystar/

3.4. Chile

Energy efficiency Standard and Mandatory Label

Chile has mandatory labels ("Etiquetado de Eficiencia Energetica") for its air conditioner, refrigerator, and lighting products, all developed after 2006. The product scope definitions and test methods follow international standards such as ISO and IEC. Mandatory standards for other selected products have not yet been developed.

Voluntary Label

No voluntary labels exist for any selected products.

Harmonization with International Standards

In order to harmonize standards with other economies, Chile recognizes product certifications issued by certification bodies from some South American and European economies (i.e. Argentina, France, Italy, Germany, and the Netherlands).

Information Availability

Chile has information regarding its standards on its government website, but there is no English translation.

Source:
Mandatory Label: Superintendencia de Electricidad y Combustibles (SEC - Superintendency of Electricity and Fuels)
http://www.sec.cl/portal/page?_pageid=33,3397595,33_3401553&_dad=portal&_schema=PORTAL

3.5. China

Energy Efficiency Standard and Mandatory Label

Mandatory Label- China Energy

China has MEPS for end-use products in the residential, commercial, and industry sectors, including room air conditioners, refrigerators, water heaters, televisions, computer monitors. Mandatory labels provide energy efficiency limits, grades and results of energy-saving evaluations. Since 2005, China has issued six lists of product catalogues for labeling covering more than twenty product categories. Several MEPS are under revision and some in development are expected by 2012, including lithium bromide absorption water chiller, hermetic motor-compressor for room air conditioners, water-source heat pumps, commercial refrigerator, self-ballasted electrodeless fluorescent lamps, single-end electrodeless fluorescent lamps, electronic ballast for single-end electrodeless fluorescent lamps, luminaires, lamp house, desktop computer, domestic solar water heating systems, and heat pump water heater.

Voluntary Label

Voluntary Label-Energy Conservation Certification

China has a voluntary label administered by the China Energy Conservation Product Certification Center (China Standard Certification Center or CSC). To date, the voluntary program has covered more than fifty product categories. For some of these products, such as lithium bromide absorption water chiller, Luminaires, desktop computer, etc, the MEPS and mandatory energy rating label are still in development.

Test Procedures

China develops its own test methods standard for nearly all products.

Harmonization with International Standards

As a major exporter of appliances, China has put great efforts into harmonization with international and regional standards in the last few years. China has initiated a regional harmonization project sponsored by Global Environmental Facility (GEF) and United Nations Development Program (UNDP), to address Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling (BRESL). China leads this effort, which also includes participation from Vietnam, Thailand, Pakistan, Indonesia, and Bangladesh.

Information Availability

China has a website devoted to the energy label program, but is only available in Chinese. Relevant regulations, standards and product registration information are available on the website. In addition, on the official website of the Standardization Administration of the People's Republic of China (SAC), all existing national standards and those scheduled to be finished in next several years can be easily searched.

Source:
MEPS & Mandatory Label: China Energy Label Management Center, China National Institute of Standardization, http://www.energylabel.gov.cn/index.aspx
Voluntary Label: China Quality Certification Center, http://www.cqc.com.cn

3.6. Hong Kong, China

Energy Efficiency Standard and Mandatory Label

Hong Kong, China (Hong Kong) introduced a Mandatory Energy Efficiency Labeling Scheme (MEELS) through the Energy Efficiency (Labeling of Products) Ordinance enacted on 9 May 2008. Under the MEELS, energy labels are required to be shown on the prescribed products for supply in Hong Kong to inform consumers of their energy efficiency performance. The initial phase of the MEELS covers three types of products: room air conditioners, refrigerating appliances and compact fluorescent lamps. The second phase of the MEELS covers two electrical appliances: washing machines and dehumidifiers, and commenced on 19 March 2010 with an 18-month grace period. A Code of Practice on Energy Labeling of Products has been approved and issued to provide practical guidance and technical details with respect to the requirements under the Ordinance. The Code of Practice was initially issued in May 2008 and revised in March 2010.

Energy Label

Grading-type Energy Label

Recognition-Type Energy Label (Verification Label)

Recognition-Type Energy Label (Information Label)

Voluntary Label

Hong Kong runs a Voluntary Energy Efficiency Labeling Scheme covering 18 types of household appliances and office equipment as well as for petrol-powered vehicles. The voluntary label covers product scope not regulated under the Energy Efficiency (of Products) Ordinance. The voluntary scheme has two kinds of energy labels for different product types. The grading-type energy labels apply to room coolers (voluntary scheme), household refrigeration appliances (voluntary scheme), washing machines (voluntary scheme), electric storage water heaters and electric clothes dryers. The recognition-type energy labels apply to other appliances and equipments including non-integrated type compact fluorescent lamps, television sets, liquid crystal display (LCD) monitors, domestic instantaneous gas water heaters, electronic ballasts, computers, etc. The recognition-type energy labels are classified into two types, namely verification label and information label. A verification label indicates the appliance meets the energy performance standards as required by the scheme and is a compulsory requirement for participant to affix this label to his registered appliances. An information label contains information to guide the general public to contact the Authority regarding inquiries about the scheme and the affixation of this label to registered appliances is optional. The Scheme will be revised periodically to reflect the technology change and prevailing practices in the industry.

Test Procedures

The test methods in Hong Kong are aligned with relevant recognized international standards (e.g. ISO, IEC and CIE) or national standards (e.g. Japanese Industrial Standards (JIS), European Standard (EN) and GuoBiao (GB)) in view of the market situation. For example, the household washing machines are not governed by any ISO standard. In Hong Kong, there are two major types of appliances, Category 1 (drum type) and Category 2 (agitator or impeller type). Thus the testing

methodology is modeled along these two standards, respectively the IEC 60456 for Category 1 or JIS C 9606 for Category 2.

Harmonization with International Standards

As mentioned above, Hong Kong's testing procedures are generally modeled from or based on relevant international standards or national standards (in the case where relevant international standards do not exist).

Information Availability

Hong Kong provides detailed information, documents, and publications in English on the Electrical and Mechanical Services Department's official website regarding the mandatory and voluntary energy efficiency labeling schemes. Registration records of energy efficiency schemes for products are available online at the Department's website and updated regularly, which include registration No., Brand Name, Category, Model, Annual Energy Consumption, Energy Efficiency Grade, and other Product Information. Contact information for inquiries including telephone, fax, email, address is also indicated.

Source:
Mandatory Label: Electrical and Mechanical Services Department,
http://www.emsd.gov.hk/emsd/eng/pee/eels_mandate.shtml
Voluntary Label: Electrical and Mechanical Services Department,
http://www.emsd.gov.hk/emsd/eng/pee/eels_vlntry.shtml

3.7. Indonesia

Energy Efficiency Standard and Mandatory Label

Indonesia has some MEPs for electrical appliances based on the Standard National Indonesia (SNI) and other technical standards on energy performance testing standards (EPTS) for electrical appliances. Additional energy efficiency standards on electrical appliances are in development. But to-date, Indonesia has not yet introduced mandatory energy labels.

Voluntary Label

In 2008, Indonesia launched a voluntary energy labeling program. CFLs were the first labeled product. According to its roadmap, the labeling program intends to cover televisions, refrigerators, air conditioners, ballasts, and washing machines in the next several years.

Voluntary Label Program

Test Procedures

Most of Indonesian National Standard (SNI) and test methods of MEPs and labeling programs have been adopted directly from the International Electrotechnical Commission (IEC) standard.

Harmonization with International Standards

Indonesia actively participates in regional harmonization initiatives on energy efficiency standards or labeling such as BRESL project.

Information Availability

Indonesia provides very limited information on its official website, particularly on the English version.

Source:
MEPS & Label: Compendium of Energy Efficiency Policies of APEC Economies, 2010, Asia Pacific Energy Research Centre, Institute of Energy Economics, Japan, posted on the website at www.ieej.or.jp/aperc.

3.8. Japan

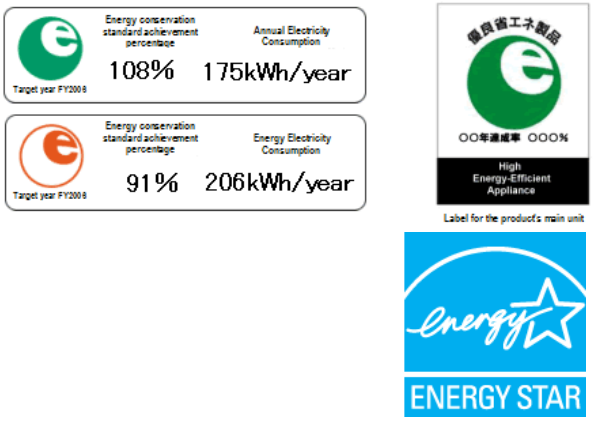
Energy Efficiency Standard and Mandatory Label

Japan does not have MEPS, instead it implements "The Top Runner Program," which is prescribed under the law concerning the rational use of energy (energy conservation law)-Section 6: measures related to machinery and equipment. In the Top Runner Program, the energy efficiency target is based on the product having the highest energy efficiency of all the products in the same group that are sold on the market and efforts are made to reach the target number by the time established for each type of product. Now the target products account for 23 products.
The Program is a mandatory target energy efficiency performance program that will apply both to Japanese products and imported ones.

The Energy conservation law obliges labeling of product's name, model number, energy consumption efficiency and manufacturer's name on the product to provide information to consumers. Furthermore, the mandatory indication is limited to the minimum information to confirm the fact that the product has achieved the Top Runner standard.

Voluntary Label

The Japanese Industrial Standards (JIS) Committee on Electricity and Electronics approved the "Energy Saving Labeling program" in August 2000. Air conditioners, fluorescent lights, televisions, electric refrigerators and freezers, water heaters, and computers are included. Participation in the energy saving labeling program is a voluntary scheme based on the JIS system, which indicates in percentages the degree by which the specified equipment exceeds (or falls short of) the energy efficiency standard specified under the Energy Conservation Law. The label is required on the participants' catalogue and products: the green symbol is given to the product that meets the standard, and the orange symbol is for products that fall short of the standard.



Voluntary Labeling Program- Energy Saving Labeling Program and ENERG STAR

The Uniform energy saving label was established after the energy conservation law was revised in 2006, specifying the provision of information by retail stores to consumers as being encouraged. The label is applied to five products whose energy consumption levels are high and efficiencies significantly vary from product to product (namely, air conditioners, TV sets, refrigerators, electronic toilet bowls and fluorescent lights). Since five star ratings are easy for consumers to understand and promotes product sales by retail stores, this label is used for products sold at most retailers.

Uniform Energy-Saving Label

Japan has been implementing the ENERGY STAR program for office products since 1995.
The products are monitors and computers printers, faxes, scanners, copiers, MFDs, Digital Duplicators.

Test Procedures

The energy consumption efficiency test methods are generally based on international standards and the Japanese Industrial Standard (JIS), but when applicable standards do not exist, test methods are established independently. For TV sets, Japan refers the IEC test procedures.

Harmonization with International Standards

In the Top Runner Program, Chapter 4.5, stated the principle of "the concept behind the Measurement Methodology", "…to bear domestic and international harmonization in mind." This makes evident that Japan has prepared for harmonization efforts.

Information Availability

Information regarding the Top Runner Program and product standards is presented in English on the Japanese official energy conservation center website. More comprehensive energy conservation information is available in Japanese, e.g. the energy labeling program information and consumer guidance and the detailed information regarding manufactures and mode of products that are compliant with the Mandatory label display program.

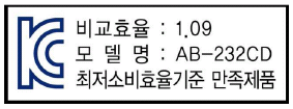
Source:
Top Runner Program & Mandatory Label, and Voluntary Label:
Asia Energy Efficiency and Conservation Collaboration Center, of The Energy Conservation Center, Japan: http://www.asiaeec-col.eccj.or.jp/index.html
Top Runner Program: http://www.asiaeec-col.eccj.or.jp/top_runner/index.html
Final Reports on the Top Runner Target Product Standards: http://www.eccj.or.jp/top_runner/

3.9. Korea

Energy Efficiency Standard and Mandatory Label

Korea launched the Energy Efficiency Standards & Labeling Program (Included MEPS) in 1992. Presently the program covers 22 target products including refrigerators, air conditioners, etc. Appliances with the energy efficiency label are covered with MEPS and energy efficiency ratio (EER) Energy Efficiency Rating standards, but fluorescent lamps ballast is only covered with MEPS. The Regulation on Energy Efficiency Labeling and Standards is updated by Ministry of Knowledge Economy (MKE). The latest version (MKE's notification 2009-158) was published on July 30, 2010.

Energy Efficiency Label for Refrigerator



Energy Efficiency Label for Fluorescent Lamps Ballasts

Korea has been running another energy efficiency program, E-Standby Program, since 1999. The program aims to reduce standby power of electronic appliances and office equipment. There are 20 e-Standby Power Program Target products. Since August 28, 2008, seven products (including computers, monitors, TVs, etc.) have been changed from a voluntary reporting scheme to a mandatory reporting scheme. The products that do not satisfy the standby power specification are subject to mandatory indication of "Warning Label." Otherwise the manufacturers and importers can voluntarily label their products as "Products with High Standby Power Reduction Potentials." Other products except the seven products are subject to voluntary High Standby Power Reduction Potentials Label.


Mandatory Warning Label for products failing standby standard

Voluntary Label

Korea has adopted the High-Efficiency Appliance Certification Program since 1996. There are 41 target products including induction motors, boilers, and lighting equipments. It is a voluntary certification scheme aiming to promote the High-efficiency Appliance and initiative market.

Voluntary Label for Products satisfying standby standard

High-efficiency Appliance Label and Certification

Test Procedures

Korea adopts ISO and IEC standards for some kinds of products, such as refrigerator & freezer, computers & monitors, televisions, etc. For AC, lighting appliances and other products, Korea developed its own test procedures.

Harmonization with International Standards

Korea started its mandatory and voluntary energy efficiency standards and labeling program in the 1990s. A comparatively comprehensive energy efficiency standards and labeling system has been established. International standards are adopted for some types of products. Korea has willingness to harmonize with relevant international or regional standards.

Information Availability

The English website of Korea Energy Management Corporation (KEMCO) provides detailed information about the above-mentioned programs including relevant specifications, procedures, testing laboratory lists, etc.

Source:
MEPS & Labels: Korea's Energy Standards & Labeling, KEMCO,
http://www.kemco.or.kr/new_eng/pg02/pg02100101.asp

3.10. Malaysia

Energy Efficiency Standard and Mandatory Label

Malaysia has been considering MEPS and mandatory labeling for appliances. Currently MEPS have been developed for ballasts.

Voluntary Label

Malaysia adopted voluntary labels for air conditioners, refrigerators, lighting, and televisions.

Voluntary Labeling Program- Comparative and Endorsement Label for Refrigerator

Test Procedures

The performance testing standards mainly adopt ISO and IEC standards.

Harmonization with International Standards

Malaysia's energy efficiency standards have good harmonization with relevant international standards.

Information Availability

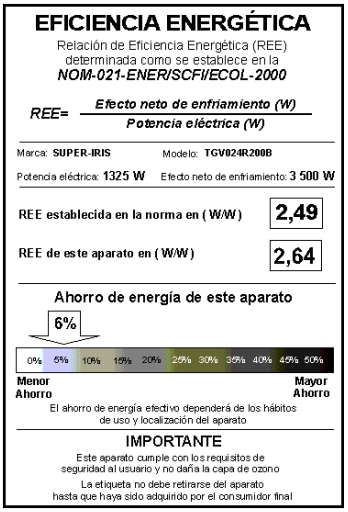
The official website of the Energy Commission of Malaysia provides information on the certification of energy efficiency product. The list of energy-efficient products approved by Energy Commission can be downloaded for reference.

Source:
MEPS: SIRIM Berhad (formerly known as the Standards and Industrial Research Institute of Malaysia) https://www.msonline.gov.my/default.php
Voluntary Labels: Suruhanjaya Tenaga (ST) (Energy Commission)
http://www.st.gov.my/index.php?option=com_content&view=article&id=5242&Itemid=4217&lang=en
Pusat Tenaga Malaysia (Malaysian Energy Centre)
http://www.ptm.org.my/index.php/energy/energy-efficiency/energy-rating-labelling.html

3.11. Mexico

Energy Efficiency Standard and Mandatory Label

Mexico has its own mandatory energy performance standards for all products except televisions, clothes dryers, computers, and monitors. Air conditioners, refrigerators and lighting products each have several subcategories. Most mandatory standards, excluding those for lighting, require labeling. Mexico recently drafted a new standard for split type, free flow, and ductless ACs. In its *Diario Oficial* on September 10, 2010, Mexico announced its new energy use disclosure requirements for a wide range of consumer and commercial electrical and electronic products. Computers and televisions are among the product categories.



Mandatory Label

Voluntary Label

Mexico has a domestic, voluntary energy efficiency label program called Sello FIDE. It covers air conditioners, refrigerators and freezers, commercial refrigeration, televisions, clothes washers, electrical water heaters, and a comprehensive range of lighting products.

Harmonization with International Standards

Mexico's mandatory standards and testing procedures have little harmonization with international practices, although its mandatory label uses a design similar to the EnerGuide in Canada. Mexico's voluntary program references mandatory and voluntary standards in the North American market, such as the US' ANSI/ASHRAE and Canada's CAN/CSA, as well as international standards such as IES and IEC.

Voluntary Label

Information Availability

Mexico has detailed information and clear instructions on its government websites regarding its standards/labels. Its voluntary label website offers detailed information on registered manufacturers and models that are certified. The sites are both in Spanish and do not have an English translation.

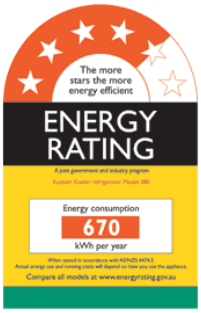
Source:

MEPS & Mandatory Label: Comisión Nacional para el Ahorro de Energía (Conae) (CONAE - National Energy Savings Commission)
http://www.conae.gob.mx/wb/CONAE/CONA_1002_nom_publicadas_vigen
Voluntary Label: La Comision Federal de Electricidad
http://fide.codice.com/home/subhome.asp?seccion=3

3.12. New Zealand

Energy Efficiency Standard and Mandatory Label

New Zealand works with Australia on the Equipment Energy Efficiency (E3) Program, which develops energy efficiency measures for a range of residential, commercial, and industrial products including MEPS and labeling. MEPS and/or labeling requirements for products are set out in energy performance standards. The mandatory labeling program applies to air conditioners, clothes dryers, domestic fridges and freezers, and washing machines. Clothes washers and dryers have labeling requirements, but they are not subject to MEPS.



Energy Rating Labels

Now, New Zealand is also considering revisions to existing standards concerning refrigerated display cabinets (commercial refrigerators and freezers), air conditioners/heat pumps, refrigerators and freezers (domestic) and electronic storage water heaters. New MEPS are planned to be introduced for commercial chillers / AC chiller towers, close control (computer room) air conditioners, televisions, set top boxes, compact fluorescent lamps, computers (PCs and monitors), gas water heaters, etc. New labeling for televisions are also planned to be introduced.

Voluntary Label-ENERGY

Voluntary Label

New Zealand adopted ENERGY STAR as its voluntary label for products including refrigerators and freezers, washing machines, televisions, computers, monitors / displays, heat pumps, solar water heating systems, and compact fluorescent lamps (CFLs).

Test Procedures

Test methods for mandatory standards and labeling are mostly developed by New Zealand and Australia jointly. For ENERGY STAR, depending on the product category, the specifications, including test procedures, are developed in the New Zealand or the US.

Harmonization with International Standards

New Zealand has developed its mandatory standards and testing procedures jointly with Australia. International test standards are used for only a small number of products. However, it is now policy that all Standards revisions, and new MEPS developments should consider the use of international Standards if possible.

Information Availability

New Zealand provides detailed information on MEPS, energy rating labels and the ENERGY STAR program through the official website of Energy Efficiency and Conservation Authority (EECA). Information includes regulations, criteria, specifications, guidelines, upcoming and proposed steps, products information, etc.

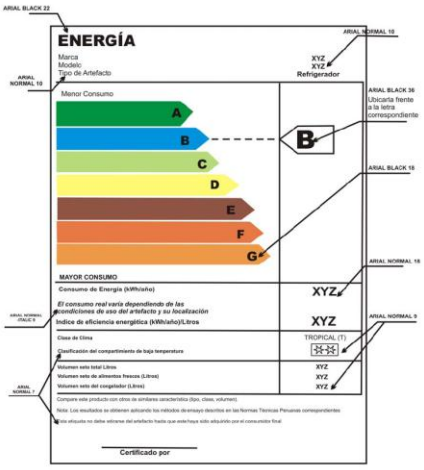
Source:
MEPS & Labels: Energy Efficiency and Conservation Authority http://www.eeca.govt.nz/standards-and-ratings/minimum-energy-performance-standards-and-labelling
ENERGY STAR: Energy Efficiency and Conservation Authority http://www.eeca.govt.nz/suppliers-and-partners/energy-star-partners/energy-star-product-specifications

3.13. Papua New Guinea

Further research required prior to submission of the final report.

3.14. Peru

Energy Efficiency Standard and Mandatory Label



Peru has mandatory standards and labels for its refrigerators, lighting and water heating products, all developed after 2007. It is currently revising its standard for electric water heaters and drafting a standard for gas water heaters.

Voluntary Label

No voluntary label exists for any selected products.

Harmonization with International Standards

Peru's mandatory standards and testing procedures have little harmonization with international practices. However, the label design follows European format.

Information Availability

Peru provides an overall guide to its standards/labels on its government website but there is no English translation.

Source:
MEPS & Mandatory Label: Ministerio de Energias y Minas (Ministry of Energy and Mining)
http://siee.minem.gob.pe/index.php?path=MQ==

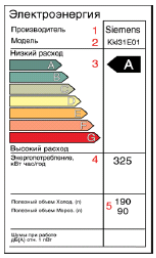
3.15. Russia

Energy Efficiency Standard and Mandatory Label

Currently, there are no MEPS and mandatory labeling programs in Russia. The government is planning to introduce mandatory MEPS for large household appliances and electric appliances.[1] As the Federal Law No. 261-FZ "On Saving Energy and Increasing Energy Efficiency, and on Amendments to Certain Legislative Acts of the Russian Federation" came into force on November 27, 2009, obligatory posting of energy efficiency class/rank by marking and labeling most domestically-produced and imported goods (to come into effect on January 1, 2011 for large household appliances and on January 1, 2012, for computers and computer-related electronic devices, and office equipment) will also be implemented. On December 31, 2009 the Russian Government approved a list of goods that will now be subject to energy efficiency regulations.

Voluntary Label

Under GOST P 51388-99 "Energy conservation and informing consumers about energy efficiency of equipment in the residential sector," voluntary energy performance certificates and energy saving labeling for specified equipment, materials, and products are currently being used for household electrical appliances.



1. Maker
2. Model
3. Energy Consumption Class (A to G)
4. Actual energy consumption (kWh/year)
5. Size of the freezer and refrigerator, etc.

Test Procedures

The previous labeling program has been developed in correspondence with the European Union (EU) labeling scheme as well as to the IEC and ISO test procedures.

Harmonization with International Standards

The economy may take reference from other economies' best practices in developing its own standards as well as testing methodologies thus contributing to harmonization.

Information Availability

No website for energy efficiency standards or labeling.

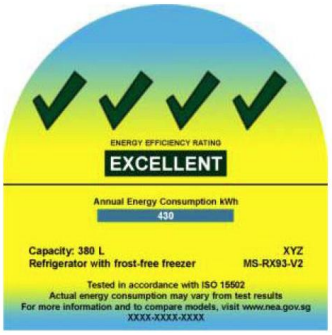
Source:
Compendium of Energy Efficiency Policies of APEC Economies, 2010, Asia-Pacific Energy Research Centre, Institute of Energy Economics, Japan, posted on the website at www.ieej.or.jp/aperc.

[1] Compendium of Energy Efficiency Policies of APEC Economies, 2010, Asia Pacific Energy Research Centre, Institute of Energy Economics, Japan, posted on the website at www.ieej.or.jp/aperc.

3.16. Singapore

Energy Efficiency Standard and Mandatory Label

Since 1 January 2008 a "Mandatory Energy Labelling Scheme" was introduced for domestic refrigerators and air conditioners. The Scheme was extended to domestic clothes dryers in Apr 2009.The Mandatory Energy Labelling scheme is administered by the National Environment Agency (NEA) and covered household air-conditioners, refrigerators and clothes dryers and is supported by the National Climate Change Committee (NCCC).



Mandatory Energy Labeling

Voluntary Label

Singapore launched a voluntary labeling scheme, the Singapore Green Labelling Scheme (SGLS), in May 1992. No energy performance information is shown on the Green Label. In 2002, Singapore launched a new voluntary comparative label, the "Energy Labelling Scheme," under the umbrella of the SGLS, which covers two categories of electrical appliances (refrigerators and air-conditioners). Currently, the criterion SGL 029 - 030 for domestic refrigerators and air-conditioners are no longer endorsed for their energy efficiency under the SGLS. Essentially, there is no voluntary energy efficiency labeling scheme in Singapore, although the assessment criterion under the SGLS does include energy efficiency requirements

Voluntary Label – Singapore

Test Procedures

Singapore Mandatory Energy Labeling Scheme for household air-conditioners, refrigerators and clothes dryers follow ISO, IEC and JIS.

Harmonization with International Standards

International test standards and frequently-adopted national test standard by economies, such as JIS, are used for the energy labeled products in Singapore. Considering its energy labeling scheme covers comparatively less product categories and the MEPS are under development, Singapore has great potential for more extensive harmonization with international standards in the future.

Information Availability

There is detailed information on Singapore's official website regarding the Energy Labeling Scheme. Relevant regulations, registration procedures, fees, test standards and report, tick rating and accredited testing laboratories are available on website. A database of registered goods renders consumers to search specific product information. Enquiry approaches including telephone, fax and email are provided.

Source:
Mandatory Label: National Environment Agency,
http://app.nea.gov.sg/cms/htdocs/category_sub.asp?cid=258

3.17. Chinese Taipei

Energy Efficiency Standard and Mandatory Label

Chinese Taipei has introduced mandatory Minimum Energy Performance Standards (MEPS) for appliances and lighting covering air conditioners, water chillers, refrigerators, fluorescent lamps, etc. Chinese Taipei respectively promulgated Requirements on Labeling and Inspection of the Energy Consumption and Energy Efficiency Rating for Room Air Conditioners in March 19, 2010 and the Requirements on Labeling and Inspection of Energy Consumption and Energy Efficiency Rating for Refrigerator/Freezer Products in March 22, 2010. According to the requirements, while displaying or marketing the products, the dealer shall display or post the energy efficiency rating label on the front of the products and the product energy efficiency rating logo (see Figure at right) shall be displayed in a legible manner beside the product picture/illustration on the product catalog used in the premises where the products are marketed. When manufacturing or importing the products, the dealer shall display the energy efficiency label in the product instruction/manual, or place the label in a prominent area on the front of the product. The energy efficiency rating labels for self-ballasted fluorescent lamps, fluorescent lamps, conducted air conditioners, and compact fluorescent lamps are scheduled to be effective in several years.

Energy Efficiency Rating Label as displayed in product manual or prominent area on the front of

Energy Efficiency Rating Logo as displayed in the product catalogs

Voluntary Label

Voluntary Label-Energy Conservation Label Program

Chinese Taipei initiated the Energy Conservation Labeling Program in December 2001. It is a government-supported voluntary endorsement label for energy efficiency products. It applies primarily to household appliances, including lighting, office equipment, gas burning appliances, and vehicles. Currently, the program covers 28 product categories open for application including air conditioners, refrigerators, televisions, fluorescence lamps, clothes washers & dryers, fluorescent lamps with embedded ballast, monitors, instantaneous gas water heaters, electric storage tank water heaters, electric pots, exit lights and emergency direction lights, luminaires, compact fluorescent lamps, and other products. Currently, 4,360 products with 260 brand names are labeled and available on the Energy Label website.

Test Procedures

For most of the products, Chinese Taipei has developed its own test methods named as Chinese National Standard (CNS) or test conditions and methodology approved by the energy regulating competent authority. Its voluntary label program testing standards for fluorescent lamps, monitors, televisions, clothes washers follow ENERGY STAR Program regulations, International Electrotechnical Commission (IEC), International Commission on Illumination (CIE) and Japanese Industrial Standards (JIS).

Harmonization with International Standards

International test standards are used for a small number of products, but it has national test standards for most products.

Information Availability
Chinese Taipei has detailed information on its official website regarding Energy Label Program and Energy Efficiency Rating Label Program. Relevant regulations, official documents, procedures, and criteria are available. Energy label product specifications and purchasing information can be searched by product category and manufacturer.

Source:
MEPS: http://www.apec-esis.org/countrysummary_sl.php?country=Chinese Taipei&ID=260
Mandatory Label: Bureau of Energy, Ministry of Economic Affairs, https://ranking.energylabel.org.tw/
Voluntary Label: Bureau of Energy, Ministry of Economic Affairs,
http://www.energylabel.org.tw/index_en.asp

3.18. Thailand

Energy Efficiency Standard and Mandatory Label

Thailand is currently targeting development of MEPS for 50, and HEPS for 54, different appliances, machines, and equipments. Thailand has the mandatory certification mark, which is operated by Thai Industrial Standards Institute.

Voluntary Label

There are two organizations responsible for labeling programs, the Electricity Generating Authority of Thailand (EGAT) and the Department of Alternative Energy Development and Efficiency (DEDE). Both are sub divisions under the Ministry of Energy. EGAT has been conducting an energy labeling program covering several appliances and equipment items since 1994. At present, EGAT is promoting 12 appliances, a variety of equipment items, and Standby Power for televisions and monitors. In addition, DEDE has been conducting an energy labeling program for non-electric products, such as LPG stoves, VSD, and glazing and insulation since 2007.

Test Procedures

Most of test procedures of Thailand's energy efficiency standards are aligned with relevant international standards, such as ISO, IEC, or generally-adopted national standards, such as JIS and Air-Conditioning and Refrigeration Institute (ARI).

Voluntary Label for electric products

Voluntary Label for non-electric products

Mandatory Certification Mark

Harmonization with International Standards

Thailand participates in regional harmonization efforts for energy efficiency standards.

Information Availability

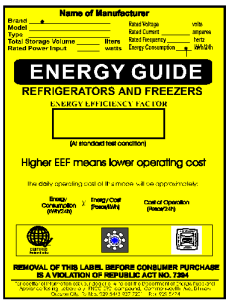
Thailand provides information about energy efficiency standards on the official website of Thai Industrial Standards Institute (TISI). On the official website of Electricity Generating Authority of Thailand (EGAT), and Department of Alternative Energy Development and Efficiency (DEDE), energy label and standard documents can be downloaded for reference.

Source:
MEPS: Thai Industrial Standards Institute (TISI), http://www.tisi.go.th/eng/index.php
Electric Labels: Electricity Generating Authority of Thailand (EGAT),
http://www2.egat.co.th/labelNo5/
MEPS, HEPS and Non-electric Labels: Department of Alternative Energy Development and Efficiency (DEDE)
http://www.dede.go.th

3.19. Philippines

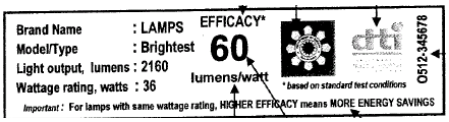
Energy Efficiency Standard and Mandatory Label

Philippines has MEPS for air conditioners, refrigerators and freezers, double-capped fluorescent lamps and CFLs. Mandatory Energy Efficiency Labeling is applied to non-ducted air conditioners, refrigerators and freezers, and lighting appliances including single-capped fluorescent lamps , self-ballasted lamps, and ballast. National standards on energy efficiency and labeling requirements for high intensity discharge (HID) lamps, luminaires and incandescent lamps for domestic and similar general lighting purposes have been developed but not implemented.

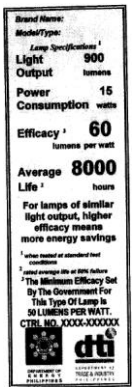


Energy label for refrigerators and freezers

Energy label for AC supplied



Energy label for single-capped fluorescent lamps



Energy label for self-ballasted lamps

Voluntary Label

Voluntary Label

Philippines introduced the Efficient Lighting Initiative (ELI) as its voluntary label for CFLs, double-capped fluorescent lamps and ballasts of double-capped fluorescent lamps.

Test Procedures

Philippines adopted IEC test standards for nearly all products categories.

Harmonization with International Standards

International test standards are used for nearly all products categories.

Information Availability

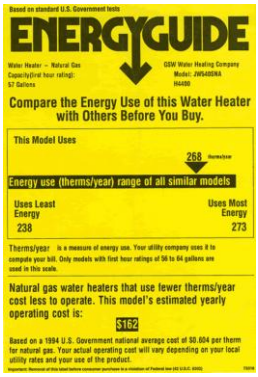
Relevant standards and circulars can be found on the website of Bureau of Product Standards, Department of Trade and Industry of Philippines. The official website of Department of Energy of Philippines provides the product list of certified refrigerators, room air conditioners, ballasts and compact fluorescent lamps.

Source:
MEPS & Labels: Department of Energy,
http://www.doe.gov.ph/EE/EefficiencyStandards.htm
Bureau of Product Standards http://www.bps.dti.gov.ph/
ELI: http://www.efficientlighting.net/

3.20. United States

Energy Efficiency Standard and Mandatory Label

The United States (US) has its own mandatory requirements for products to meet minimum energy efficiency standards for all products researched except computers, monitors, and televisions.. Some of the mandatory standards are under revision (e.g. room AC, residential central AC, refrigerators, CFL, general high intensity discharge (HID) lamps, clothes washers and dryers). The EnergyGuide Label, established by the Federal Trade Commission (FTC), requires products to display labels that provide an estimate of the products' energy consumption. This mandatory label covers refrigerators, freezers, water heaters, air conditioners, clothes washer. Pursuant to the U.S. Energy Act in 2007, the FTC was directed to develop energy use disclosure requirements for televisions, personal computers, monitors, set-top boxes, and stand-alone digital video recorders. In October 2010, FTC announced the final label requirements for TV, which will be effective in May 2011.



Mandatory Label-EnergyGuide

Voluntary Label-ENERGY STAR

Voluntary Label

The US voluntary labeling program, ENERGY STAR, covers a large range of residential and commercial appliances and electronics. Products from various manufactures are certified as ENERGY STAR products. Some of the ENERGY STAR product requirements are under revision. There is no ENERGY STAR label for clothes dryers and certain subcategories under lighting. However, a not-for profit organization, Green Seal, certified clothes dryers as part of a comprehensive labeling effort for hotel and lodging properties (4th Edition, GS-33), however, no specific energy level is required for clothes dryers.

Voluntary Label – Green Seal

Test Procedures

The US mandatory standards/labels and voluntary labels have developed their own test procedures for room AC, residential central AC, commercial AC, residential and commercial refrigerators-freezers, all subcategories of the lighting products, computer & monitors, clothes washers & dryers, and water heaters. IEC is used for television test procedures, and ISO and IEC also are incorporated with ENERGY STAR test standards for computers and monitors.

Harmonization with International Standards

The US ENERGY STAR labels are recognized in many countries and regions around the world, which has laid the foundation for harmonization efforts of voluntary energy efficiency standards among APEC economies.

Information Availability

The US DOE, FTC, and ENERGY STAR websites provide detailed information and clear instructions regarding mandatory standards and voluntary labels and revision plans. Users can track the updated federal policy documents and search labeled manufactures and products.

Source:

MEPS & Mandatory Label:
Appliance Standards Awareness Project-Federal Standards:
http://www.standardsasap.org/federal.htm
Building Technologies Program, of Energy Efficiency & Renewable Energy, US Department of Energy http://www1.eere.energy.gov/buildings/appliance_standards/
Part 430-Energy Conservation Program for Consumer Products, at Electronic Code of Federal Regulations: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title10/10cfr430_main_02.tpl
Part 431- Energy Efficiency Program for Certain Commercial and Industrial Equipment, at Electronic Code of Federal Regulations: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=38d58540923a1b1ec3a7eda9b9203085&rgn=div5&view=text&node=10:3.0.1.4.17&idno=10
Energy Savers, of Energy Efficiency & Renewable Energy, US Department of Energy:
http://www.energysavers.gov/tips/
Energy & Environment, Federal Trade Commission, Bureau of Consumer Protection:
http://www.ftc.gov/appliances/

Voluntary Label:
ENERGY STAR Program, US Environmental Protection Agency, & US Department of Energy:
http://www.energystar.gov/index.cfm?c=products.pr_find_es_products

3.21. Vietnam

Energy Efficiency Standard and Mandatory Label

Vietnam has not enforced mandatory standards and labeling programs. After the Law of Energy Conservation is approved, mandatory measures are expected to be gradually applied.

Voluntary Label

Vietnam has voluntary labels for refrigerators, air-conditioners, lamps, ballasts, and water heaters. Under the Vietnam Energy-Efficient Public Lighting (VEEPL) project, energy efficiency standards and labeling programs for ballasts for fluorescent lamps, tubular fluorescent lamps, high-pressure sodium vapor lamps, CFL, and electronic ballasts for fluorescent lamps have been developed.

Test Procedures

Test methods standard are generally aligned with IEC standards.

Harmonization with International Standards

Vietnam has been undertaking substantial international cooperation projects in the field of energy efficiency. Harmonization has been pursued via regional cooperation.

Information Availability

Energy efficiency standards can be searched on the website of Directorate for Standards, Metrology and Quality, but the database is not up-to-date. The VEEPL project website has energy efficiency standards for lighting.

Source:
MEPS & Labels: Vietnam Energy Efficient Public Lighting (VEEPL), http://www.veepl.vast.ac.vn/
Directorate for Standards and Quality (STAMEQ), http://en.tcvn.vn/

4. Cross-Economy Product Comparisons

Findings from the research on each APEC economy, summarized in Chapter 3, were compiled to create a cross-economy matrix for each selected appliance here. The comparison demonstrates the proportion of economies in the region that have introduced mandatory S&L or voluntary labels for each product and how convergent or divergent their standards and test procedures are in terms of alignment with international standards, product scopes, and energy efficiency levels. Product matrices with more detailed information can be found in Appendix B.

4.1. Air Conditioners (ACs)

Commercial and residential air conditioners (AC) can be categorized according to unit, such as packaged AC, split AC, ductless AC, evaporation coolers, window AC, etc. They can also be categorized by condenser types as air-cool, and water-cool, or by cooling capacity as Room AC, and Central AC.

The most common AC energy efficiency standards among APEC economies are for Room AC and Central AC. Harmonizing efforts should focus on Room AC and Central AC as the primary categories for comparison.

4.1.1. Room ACs

Standards & Labels

Most economies have MEPs and mandatory labeling programs covering Room AC. A total of 15 economies, including Australia, Canada, Chile, China, Hong Kong, Indonesia, Japan, Mexico, New Zealand, Singapore, Chinese Taipei, Thailand, the Philippines, the United States, and Vietnam have adopted mandatory standards. Some economies have multiple AC standards in place, and in total, there are 19 mandatory standards, 16 mandatory labels, and 13 voluntary label programs for Room AC.

Brunei Darussalam, Papua New Guinea, Peru, Russia, and Vietnam do not have mandatory standards & labeling programs related to AC, although Vietnam does have its own test standards and voluntary labeling program.

Test Standards

Test Standards ISO 5151[Non-ducted AC and heat pumps - testing and rating for performance] have been used by six economies: Chile, Hong Kong, Malaysia, Singapore, Thailand, the Philippines, Australia, New Zealand, Canada, China, the United States, and Japan. These economies have individual test standards for their labeling programs. However the key performance characteristics used by most APEC economies are Energy Efficiency Ratio (EER) and Coefficient of Performance (COP).

Level of Energy Efficiency

It is possible for several economies to compare the level of energy efficiency for products, as common key performance characteristics have been adopted:

- EER for cooling and COP for heating are used mainly for testing the energy efficiency level for room AC.
- Minimum EER is used for MEPS, except in Japan, which uses the reach target for AC.

- Annual Performance Factor (APF) and Seasonal Energy Efficiency Ratio (SEER) are gradually substituting EER or COP to indicate the energy efficiency level of AC.

However, those energy metrics for air conditioners using EER, COP, SEER, APF etc., are not defined the same way in each of the APEC member economies. Therefore the listed metrics are not meant to be used for comparison, but rather as illustrations of each APEC member economy's individual energy level indicator.

Recommendations

It is recommended to identify a benchmarking approach that can be applied across those economies on air-conditioning products on a regular basis. A good case can be referred to the benchmarking energy performance[2] research on the APEC-ESIS website. With regard to the harmonization, it can be stated from test standards, that further in-depth analysis is recommended to compare the technical parameters within each individual economy's test standards.

Table 1 Room Air Conditioner Cross-Economy Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS3823.1.1 AS/NZS3823.1.2 AS/NZS3823.1.3	AS/NZS 3823.2:2009 - Performance of electrical appliances - Air conditioners and heat pumps Part 2: Energy labeling and minimum energy performance standard requirements	Energy Labeling for Single Phase Non-ducted Air Conditioners	Energy Labeling for Three-phase Air Conditioners and Ducted
Brunei Darussalam	None	None	None	None
Canada	CAN/CSA-C368.1-M90	MEPS for Room Air Conditioners	EnerGuide	ENERGY STAR for Room Air Conditioners
Chile	ISO 5151 (1994), NCh3081.Of 2007	Energy Efficiency Standard for Air Condition	Energy Efficiency Label for Air Condition	None
China	GB 19576-2004; GB/T 17758; GB/T 18836; JB/T 8072	GB 19576-2004 - The minimum allowable values of the energy efficiency and energy efficiency grade for unitary air conditioners	China Energy Label for unitary air conditioners	China Energy Conservation Certification for unitary air conditioners
	GB 12021.3-2010; GB/T 7725-2004	GB 12021.3-2010 - The minimum allowable values of the energy efficiency and energy efficiency grade for room air conditioners	China Energy Label for room air conditioners	China Energy Conservation Certification for room air conditioners
	GB 21455-2008; GB/T 7725	GB 21455-2008 - The minimum allowable values of the energy efficiency and energy efficiency grades for variable speed room air conditioner	China Energy Label for variable speed room air conditioners	China Energy Conservation Certification for variable room air conditioners
	CQC 2209-2009; GB/T15765-2006; GB/T 18429-2001; GB/T	n/a	n/a	China Energy Conservation Certification for

[2] http://www.apec-esis.org/webnewpage.php?DomainID=6&DMSelect=65

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	10079-2001; GB/T 19410-2008;			hermetic motor-compressor for room air conditioners
	CNS 3615, CNS 14464,CNS 7183	MEPS for Room Air Conditioners (Split)	n/a	n/a
	CNS 3615, CNS 14464,CNS 7183	MEPS for Room Air Conditioners Packaged Terminal	n/a	n/a
Hong Kong, China	ISO 5151	n/a	Mandatory Energy Efficiency Labeling Scheme for Room Air Conditioners	Voluntary Energy Efficiency Labeling Scheme for Room Coolers
Indonesia	ISO 5151	MEPS for Room AC - split type	n/a	Voluntary label for ACs
	ISO 5151	MEPS for Room AC - window type	n/a	n/a
Japan	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	Top Runner Program for RAC(packaged terminal)	Label Display Program	Energy Saving Labeling Program
	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	Top Runner Program for RAC(split)	Label Display Program	Energy Saving Labeling Program
Malaysia	MS ISO 5151:2004	n/a	n/a	Energy efficiency rating and labeling for AC
Mexico	NOM-021-ENER/SCFI-2008	Energy efficiency and user safety requirements for room air conditioners	Energy Efficiency Label	Sello FIDE for Room Air Conditioners
New Zealand	AS/NZS3823.1.1:1998 as amended, AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2005.	AS/NZS 3823.2:2005 - Performance of electrical appliances - Air conditioners and heat pumps - Energy labeling and minimum energy performance standard	Energy Labeling for Single Phase Non-ducted Air Conditioners	1. Energy Labeling for Three-phase Air Conditioners and Ducted Single-phase Units 2.NEW ZEALAND ENERGY STAR® program (Criteria for Single Phase Air Conditioners and Heat Pumps Version 2)
Papua New Guinea	None	None	None	None
Peru	n/a	n/a	n/a	n/a
Korea	KS C 9306	MEPS for AC	Energy efficiency labeling for AC	High-efficiency Appliance Certification Program - Multi-air conditioner
Russia	n/a	n/a	n/a	n/a
Singapore	ISO 5151: 1994; JIS C 9612: 1994	None	Mandatory Energy Labeling Scheme – RACs (Casement and Window)	None
	ISO 5151: 1994; JIS C 9612: 1994	None	Mandatory Energy Labeling Scheme - RACs Split	None
Chinese Taipei	CNS 3615; CNS 14464	MEPS for Room Air Conditioners (Non-duct)	Energy Efficiency Rating and Labeling for Room Air Conditioners	Energy Label Program for Non-ducted Air Conditioners
Thailand	TIS 1155-2536 (2002), TIS 385-2524 (1990);	TIS 2134-2545 (2002): Room Air Conditioners Environment Requirements Energy Efficiency - RACs Window/Split	Mandatory Certification Mark	Energy Efficiency Label
The	PNS240:1998/ISO	PNS 396-1:1998	PNS 396-1:1998	n/a

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Philippines	5151:1994	Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 1: Non-ducted air conditioners	Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 1: Non-ducted air conditioners	
US	CFR 430 Subpart B, Appendix F: ANS Z234.1–1972: ASHRAE Standard 16–69	10 CFR Part 430 Energy Conservation Program for Consumer Products; Conservation Standards for Room Air Conditioners;	EnergyGuide	ENERGY STAR
Vietnam	TCVN 7831:2007 Air-conditioners. Method for determination energy efficiency	None	None	TCVN 7830:2007 Air-conditioners. Energy Efficiency Ratio

4.1.2. Central ACs

Standards & Labels

Central AC products are mainly produced by major economies within APEC. There are eight economies, including Australia, China, Japan, Korea, Mexico, New Zealand, Chinese Taipei and the US, that in total, have 17 energy efficiency mandatory standards for various central AC products, 11 mandatory labels, and 15 voluntary labels.

Test Standards

Each economy has its individual test procedure for Central ACs, however all recognizing the common key indicators for Central ACs.

Level of Energy Efficiency

Namely, some performance characteristics used for Central AC include:

- Seasonal Energy Efficiency Ratio (SEER)
- Annual Performance Factor (APF)
- Heating Seasonal Performance Factor (HSPF)
- Cooling Seasonal Performance Factor (CSPF)
- The Integrated Part Load Value (IPLV)

However, those energy metrics for air conditioners using SEER, APF, HSPF, CSPF, and IPLV are not defined the same way in each of the APEC member economies. Therefore the listed metrics are not meant to be used for comparison, but rather as an illustration of each APEC member economy's individual energy level indicator.

Recommendations

With regard to the harmonization, it can be stated from test standards, that further in-depth analysis is recommended to compare the technical parameters within each individual economy's test standards.

Table 2 Central Air Condition Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4776 1.1; AS/NZS 4776 1.2	AS/NZS 4776.2-2008: Liquid-chilling packages using the vapor compression cycle - Minimum energy performance standard (MEPS) and compliance requirements	Energy Labeling for Non-ducted Air Conditioners	Energy Labeling for Three-phase Air Conditioners and Ducted
	AS/NZS 4965.1-2008	AS/NZS 4965.2-2008: Performance of close control air conditioners - Minimum energy performance standard (MEPS) requirements	None	None
Canada	CAN/CSA-C656-05	MEPS for Single-Phase and Three-Phase Single-Package Central Air Conditioners and Heat Pumps	n/a	ENERGY STAR for Residential Air-Source Heat Pumps (ASHPs) and Central Air Conditioners
	CAN/CSA-C656-05	MEPS for Single-Phase and Three-Phase Split-System Central Air Conditioners and Heat Pumps	n/a	ENERGY STAR for Residential Air-Source Heat Pumps (ASHPs) and Central Air Conditioners
	CAN/CSA-C744-04	MEPS for Packaged Terminal Air Conditioners and Heat Pumps	n/a	n/a
China	GB21454-2008; GB/T 18837	GB21454-2008 The minimum allowable values of the IPLV and energy efficiency grades for multi-connected air-condition (heat pump) unit	China Energy Label for multi-connected air-condition (heat pump) unit	China Energy Conservation Certification for multi-connected air-condition (heat pump) unit
	GB 19577-2004; GB/T 18430; GB/T 10870	GB 19577-2004 - The minimum allowable values of the energy efficiency and energy efficiency grades for water chillers	China Energy Label for water chillers	China Energy Conservation Certification for multi-connected air-condition (heat pump) unit
	CQC 3106-2009; GB/T18431-2001; GB/T 18362-2008	The minimum allowable values of the energy efficiency and Energy Conservation Values for lithium bromide absorption water chiller	n/a	China Energy Conservation Certification for Lithium Bromide Absorption Water Chiller
	CQC3123-2010; GB/T19409-2003	The minimum allowable values of the energy efficiency and Energy Conservation Values for Water-source heat pumps	n/a	China Energy Conservation Certification for water source heat pumps
	CQC3126-2010; GB/T 19413-2003	n/a	n/a	China Energy Conservation Certification for unitary air conditioners for computer and data processing room
Japan	JIS B 8616; JIS C 9612	Top Runner Program for Central AC	Label Display Program	Energy Saving Labeling Program
	JIS B 8615-2; ISO 13253	Top Runner Program for Ducted AC and heat pumps	Label Display Program	Energy Saving Labeling Program

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	JIS B 8615-1; ISO 5151	Top Runner Program for Non-ducted AC	Label Display Program	Energy Saving Labeling Program
Mexico	NOM-011-ENER-2006	Energy efficiency in central air conditioning, package or split	Energy Efficiency Label	Sello FIDE for Central Air Conditioners (packaged &split)
New Zealand	AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2002;AS /NZS3823.3:2009	AS/NZS 3823.2:2005 - Performance of electrical appliances - Air conditioners and heat pumps - Energy labeling and minimum energy performance standard	Energy Labeling for Non-ducted Air Conditioners	n/a
Chinese Taipei	CNS 12575, CNS 12812	MEPS for Water Chiller	n/a	n/a
US	CFR 430 Subpart B, Appendix M: AHRI Standard 210/240–2006; ASHRAE Standard 23–2005; ASHRAE Standard 37–2005; ASHRAE Standard 41.1–86 (RA 01); ASHRAE Standard 41.2–87 (RA 92); ASHRAE Standard 41.6–94 (RA 01);ASHRAE Standard 41.9–00;ASHRAE Standard 51–99/AM	10 CFR Part 430 Energy Conservation Program for Consumer Products: Central Air Conditioners and Heat Pumps Energy Conservation Standards;	EnergyGuide	ENERGY STAR
	subpart F of part 431: AHRI Standard 210/240–2003;AHRI Standard 340/360–2004;ISO 13256–1;AHRI Standard 310/380–2004 (CSA–C744–04)	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule	EnergyGuide	ENERGY STAR

4.2. Refrigerators and Freezers

There are two major categories of refrigeration equipment sold in the APEC market: household refrigerators/freezers and commercial refrigeration equipments.

4.2.1. Household refrigerators and/or freezers

Standards & Labels

Many APEC economies have set up standards and label programs for household refrigerators. A total of 13 economies, including Australia, Canada, China, Indonesia, Japan, Korea, Mexico, New Zealand, Peru, Chinese Taipei, Thailand, Philippines and the United States have mandatory standards for household refrigerators and freezers. A total of 15 economies have set up mandatory labels, and 12 economies have voluntary labeling programs for household refrigerators and/or freezers.

Russia and Singapore are developing mandatory standards for household refrigeration appliances. Brunei Darussalam has started developing a voluntary scheme for household refrigerators.

Test Standards

Test standards ISO 15502 *Household refrigerating appliances - Characteristics and test methods* (and its replaced series standards ISO 5155, 7371, 8187, 8561) and new IEC standard IEC 62552 *Household refrigerating appliances - Characteristics and test methods* have been referenced or directly adopted by eight economies: Chile, China, Indonesia, Hong Kong, Philippines, Korea, Singapore and Thailand. Economies are still more likely to develop individual standards based on their products.

Level of Energy Efficiency

The energy efficiency level varies with specific product types. Most existing standards define the product scopes by storage volume, but have different categories for energy efficiency metrics. There are various evaluation metrics, including annual energy consumption, daily energy consumption, monthly energy consumption, energy efficiency index, etc. Thus, it is difficult to compare the level of energy efficiency for such a wide range of refrigerators/freezers in the existing standard/label programs. It is, however, possible to identify a small group of products with similar definitions and scope in order to compare energy efficiency criteria.

Recommendations

Wide adaptation of ISO and IEC standards in existing standards indicate the possibility of test standard harmonization between these members, and economies that are developing standards and label for refrigerators/freezers.

Table 3 Household refrigerators/freezers Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS4474.1:2007/Amdt1:2008	AS/NZS 4774.2-2009: Performance of household electrical appliances-	Energy Labeling for Household Refrigerators and Freezers	None

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
		Refrigerating appliances Part 2: Energy labeling and minimum energy performance standard requirements		
Brunei Darussalam		n/a	n/a	under development
Canada	CAN/CSA C300-08; Test Criteria for ENERGY STAR in Canada is harmonized with Test Criteria for ENERGY STAR in the United States: Residential Refrigerator 10 CFR 430, Subpart B, Appendix A1; Residential Freezer 10 CFR 430, Subpart B, Appendix B1	MEPS for Household Refrigerators, Refrigerator-Freezers and Wine Chillers; MEPS for Household Freezers	Energy Guide Label	ENERGY STAR for Refrigerators, Refrigerator-Freezers and Freezers
Chile	ISO 15502 (2005)		Etiquetado de Eficiencia Energetica(Energy efficiency labels),NCh3000.Of2006	n/a
China	GB 12021.2-2008; GB/T 8059	The maximum allowable values of the energy consumption and energy efficiency grade for household refrigerators	China Energy Label for household refrigerators	China Energy Conservation Certification for household refrigerators
Hong Kong, China	ISO 15502 IEC 62552 ISO 7371 ISO 8187 ISO 8561 ISO 5155	n/a	Mandatory Energy Efficiency Labeling Scheme for Refrigerating Appliances	Voluntary Energy Efficiency Labeling Scheme for Household Refrigeration Appliances
Indonesia	SNI IEC 15502-2009 Voluntary label: SNI 04-6710-2002; SNI 04-6711-2002; SNI 04-6958-2003	Minimum energy performance standard for household refrigerators	n/a	Voluntary label for refrigerators
Japan	JIS C 9801(1999); JIS C 9801(2006)	Top Runner Program for Refrigerators-Freezers	Label Display Program	Energy Saving Label Program
Malaysia	ISO 8561 : 2000	n/a	n/a	Energy efficiency rating and labeling for refrigerators
Mexico	NOM-015-ENER-2002	Energy efficiency of refrigerators and freezers appliances	Energy Efficiency Label	Sello FIDE Label for Household Refrigerators and Freezers
New Zealand	AS/NZS 4474.1:2007	AS/NZS 4774.2-2009: AS/NZS4474: Performance of household electrical appliances-Refrigerating appliances Part 2: Energy labeling and	Energy Labeling for Domestic Fridges and Freezers	NEW ZEALAND ENERGY STAR® program (Criteria for Refrigerators and Freezers)

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
		minimum energy performance standard requirements		
Peru	NTP 399 483 2007	Peruvian Technical Standard NTP 399 483 2007 Energy Efficiency for refrigerators, refrigerators-freezers and freezers for domestic use	Energy Efficiency Label	n/a
Korea	KS C ISO 15502	MEPS for refrigerators; MEPS for freezers	Energy efficiency labeling for refrigerators; for freezers	n/a
Russia	GOST 30204-1995 (Household electrical refrigerating appliances. Performance and test methods)	Underdevelopment	Under development, effective on Jan 1, 2011	Energy conservation. Household electrical refrigeration appliances. Efficient of energy consumption. Determination methods
Singapore	IEC 62552 ISO 15502	Will be implemented in 2011	Mandatory Energy Labeling Scheme – Refrigerators	n/a
Chinese Taipei	CNS 2062-95 CNS 9577-89	MEPS: Refrigerators-Freezers - Chinese Taipei	Energy Efficiency Rating for Refrigerator/Freezers	n/a
Thailand	TIS 2186-2547 (2004); IEC 62552	TIS 2186-2547 (2004) Household Refrigerator: Environment Requirements; Energy Efficiency Refrigerator	Mandatory Certification Mark	Energy Efficiency Label (Criteria for one- and two-door models)
The Philippines	PNS1474:1997/ISO 5155:1995; PNS1475:1997/ISO 7371 :1995; PNS 1476:1996/ISO 8187:1991;PNS 1477:1996/ISO 8561:1995	PNS 396-2:1997 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 2: Refrigerators and freezers	PNS 396-2:1997 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 2: Refrigerators and freezers	n/a
US	Appendix A1 to Subpart B of Part 430: HRF–1–1979; ANSI B 38.1–1970 Appendix B1 to Subpart B of Part 430: HRF–1–1979; ANSI B38.1–1970 Voluntary Label: (1) ANSI/NSF 7-2007; (2) UL Standard for Commercial Refrigerators and Freezers (UL-471).	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Refrigerators, Refrigerator-Freezers （Docket No. EE–RM–93–801）	Energy Guide Label	ENERGY STAR-Refrigerators and Freezers
Vietnam	TCVN 7829:2007 Refrigerator, refrigerator-freezer. Method for determination energy efficiency			TCVN 7828:2007 Refrigerator, refrigerator-freezer. Energy Efficiency Ratio

4.2.2. Commercial refrigeration equipment

Standards & Labels

Fewer APEC members have focused on commercial refrigeration compared with household models. Australia, Canada, Mexico, New Zealand, Korea, and the US have launched mandatory standards for commercial refrigeration equipment, and among them, Mexico, Korea and the US have launched mandatory labels. China is currently developing mandatory MEPS and label standards, and Thailand is working on mandatory MEPS and voluntary HEPS. Canada and the US have ENERGY STAR voluntary label programs, and Mexico has its own label for commercial refrigeration.

Test Standards

Minimal convergence with regard to test standards exists among economies. However, this may suggest a potential focal area for harmonization, since many other members have not developed test standards yet.

Level of Energy Efficiency

Most existing standards base criteria on actual energy consumption for a certain period of time (per year, per month, or 24 hours), but comparison is still difficult because each standard uses different product definitions and refers to different test standards. Also, there is complex calculation formulas used for evaluation values.

Recommendations

Compared with household refrigeration appliance standards and labels, commercial equipment is new in the market, but has great potential in the APEC region. This stage allows for greater up-front collaboration in development of test methods and standards and labels.

Table 4 Commercial Refrigeration Cross-Economy-Product Matrix

Economy	Test Method/ Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS 1731.(1-13): 2003	AS 1731.14-2003: Refrigerated display cabinets - Minimum energy performance standard requirements	None	None
Canada	ASHRAE standard 117-1992 ASHRAE standard 72-1998 AHRI Standard 1200-2008,Method of Testing Commercial Refrigerators and Freezers"（Voluntary label）	MEPS for Self-Contained Commercial Refrigerator & Freezer	n/a	ENERGY STAR for Commercial Refrigerators and Freezers
China	Under development	Under Development: The minimum allowable values of the energy efficiency and Energy efficiency grades for commercial refrigerator	None	None
Mexico	NOM-022-ENER/SCFI-2008	Energy efficiency and user safety	Energy Efficiency Label	Sello FIDE Label for Commercial

Economy	Test Method/ Standard	Mandatory Standard	Mandatory Label	Voluntary Label
		requirements for self-contained commercial refrigeration		Refrigeration
New Zealand	AS 1731 Parts 1 to 13:2003	AS 1731.14:2003: Refrigerated display cabinets—Minimum energy performance standard (MEPS)	None	None
Korea	KS C ISO 15502	MEPS for Commercial Refrigerators	Energy efficiency labeling for Commercial Refrigerators	n/a
Thailand	EN 441: 1996	Under development: Minimum Allowable Values for Energy Efficiency	None	None
The US	Subpart C of Part 431, Subpart R of part 431 Voluntary Label: (1) ANSI/NSF 7-2007; (2) UL Standard for Commercial Refrigerators and Freezers (UL-471).	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule	Energy Guide Label	ENERGY STAR

4.3. Domestic and Commercial lighting

Lighting is defined using broad product categories based on photoelectric characteristics and application purpose, e.g. Compact Fluorescent Lamps (CFLs), Linear Fluorescent Lamps (FLs), Solid State Lamps, Road Lamps and ballasts, etc. To make them comparable, streamlined product categories are listed in this section. We have categorized the lighting equipment into seven groups: CFLs, fluorescent, incandescent, high intensity discharge (HID), solid state, other lighting products, and ballast.

4.3.1. Compact Fluorescent Lamps (CFLs)

Standards & Labels

CFLs are widely-used lamps that are considered energy-efficient substitutes for incandescent lamps. Many APEC economies have established standards and label programs for CFLs. Eight economies, including Australia, Canada, China, Japan, Peru, Chinese Taipei, the Philippines and the US, have mandatory standards. In addition, Thailand has voluntary minimum energy efficiency standards for CFLs. Eight economies have set up mandatory labels, and 12 economies (Canada, China, Hong Kong, China, Japan, New Zealand, Korea, Mexico, Chinese Taipei, Thailand, the Philippines, the US and Vietnam) have set up voluntary labeling programs.

Test Standards

Test standards serve as the critical foundation for harmonization. Many APEC economies have developed their own individual test standards to measure key performance characteristics, for example, Australia requires use of *AS/NZS 4847.1 Self-ballasted lamps for general lighting services - Test methods - Energy performance,* while Canada uses *CSA C861-06 for power* and luminous flux testing and *IES LM65-01* for lifetime testing. But we identify the convergence between Chile, China, Hong Kong, China, Thailand, and the Philippines, who have all adopted or referenced IEC standard *IEC 60969 Self-ballasted lamps for general lighting services - Performance requirements* in their S&L scheme. This offers a common standard and also provides a reference for economies currently developing or planning to develop test standards.

Level of Energy Efficiency

CFL performance characteristics vary, and may include efficacy, lumen maintenance, etc. Thus, there are various criteria items required in existing economies' standards. For instance, Australia set up criteria for start-up time, run time, luminous flux, efficacy and lumens maintenance, power, power factor and harmonics, premature lamp failure rate, low temperature starting, switching withstand, lamp life, color attributes and mercury content, while Thailand's standard focus on lifetime, lumen maintenance and efficacy. Almost every standard involves criteria for 'efficacy.'

The level of energy efficiency is related to product type, yet product scopes and definitions vary from member to member. China MEPS cover products with rated power no more than 60W, while US ENERGY STAR defines the target products by size. It is difficult to directly compare the level of energy efficiency within various lamp types.

Recommendations

Wide adaptation of IEC standards indicates the possibility of test standard harmonization between these members and suggests a common approach for economies currently developing or considering developing standards.

CFL is a less complex product compared to others. It is possible to identify the specific types that are most common in the economies, and look for opportunities to harmonize test standards.

Table 5 Compact Fluorescent Lamps (CFL) Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4847.1:2010; AS/NZS 4782.3(Int):2006	AS/NZS 4847.2-2010: Self-ballasted lamps for general lighting services - MEPS requirements	None	None
Canada	CSA C861-06 for power and luminous flux; IES LM65-01 for life **Voluntary label**: IESNA – LM66-00,IESNA – LM65 & ANSI – C78.5,CIE Publication 13.3 - 1995,ANSI/IEEE C62.41 (01-May-1991), Category A, 7 strikes, FCC 47 CFR including Part 2 (Equipment Authorization) and Part 18 (Technical Standards and Emission Limits) for consumer RF Lighting Equipment limits Industry Canada - ICES-005: Radio Frequency Lighting Device Regulation	MEPS-CFL package labeling	n/a	ENERGY STAR for CFLs
Chile	NCh3020.Of2006 IEC 60969 (2001)	None	Energy Efficiency - CFL for General lighting - Classification and Labeling	None
China	GB19044-2003; GB/T17263; (ref:IEC 60969)	GB19044-2003 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for self-ballasted fluorescent lamps for general lighting service	China Energy Label for self-ballasted fluorescent lamps for general lighting service	China Energy Conservation Certification for self-ballasted fluorescent lamps for general lighting service
Hong Kong, China	IEC 60969, CIE 84	None	Mandatory Energy Efficiency Labeling Scheme for Compact Fluorescent Lamps	None
	IEC 60901, CIE 84	None	None	Voluntary Energy Efficiency Labeling Scheme for Non-integrated Type Compact Fluorescent Lamps
Japan	JIS C 7601; JIS C 8105-3	Top Runner Program for Fluorescent Lamps	Label Display Program	Energy Saving Labeling Program
Korea				High-Efficiency Appliance Certification Programs for Fluorescent Lamps
Mexico	NOM-017-ENER/SCFI-2008; NMX-J-295-ANCE; NMX-J-531-ANCE	Energy efficiency and security requirements of compact fluorescent lamps	None	Sello FIDE Label for CFLs and self-ballasted CFLs

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
New Zealand		under consideration (would be likely to align standards with Australia)	n/a	NEW ZEALAND ENERGY STAR® program (Criteria for Compact Fluorescent Lamps)
Peru	NTP 370101-2 2008	Peruvian Technical Standard NTP 370101-2 2008 Energy Efficiency for circular, linear, and compact fluorescent and similar lamps for household use	Energy Efficiency Label	None
Chinese Taipei	CNS14567	MEPS for Compact Fluorescent Lamps	under development	Energy Label Program for Compact Fluorescent Lamps
Thailand	TIS 2233 , IEC 60969	TIS 2310-2549 (2006) Self-Ballasted Lamps for General Lighting Services: Energy Efficiency Requirements (MEPS: voluntary standards)	None	Energy Efficiency Label
The Philippines	PNS 969:2006; Voluntary Label: IEC60969	PNS 2050-2:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 2: Self-ballasted lamps for general lighting services	PNS 2050-2:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 2: Self-ballasted lamps for general lighting services	Efficient Lighting Initiative Program - CFLs
The US	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	EnergyGuide	ENERGY STAR
Vietnam				TCVN 7896:2008 Compact Fluorescent Lamps (CFL). Energy efficiency

4.3.2. Fluorescent Lamps

Standards & Labels

Fluorescent Lamps (FLs) are commonly used in residential and commercial applications. Some APEC economies have developed standards for specific lamp types, e.g. linear FLs, double-capped FLs, single-capped FLs, circular FLs, etc. Others have developed only one standard for general FLs.

A total of ten APEC members have mandatory standards to regulate the energy efficiency of fluorescent lamps. These members include Australia, Canada, China, Japan, Korea, New Zealand, Peru, Chinese Taipei, the Philippines and the US. Thailand has voluntary MEPS and HEPS for FLs. Mandatory label programs for FLs have been launched in Canada, Chile, Japan, Peru, Korea, the Philippines and the US. Chinese Taipei is developing labeling program based on the mandatory

standards. Voluntary labeling programs have been set in Australia, Canada, Chile, China, Japan, New Zealand, Korea, Mexico, Thailand, the Philippines and the US.

Test Standards

There is minimum convergence on test standards for fluorescent lamps. Each economy has developed its own test method. Only a few economies (China, Chile, the Philippines) reference IEC standards, including IEC 60901 *Single-capped fluorescent lamps - Performance specifications*, IEC 60081 *Double-capped fluorescent lamps - Performance specifications.*

Level of Energy Efficiency

FL's performance characteristics include efficacy, color rendering, lumen maintenance, etc. Most existing standards include criteria for efficacy. However, the efficacy levels are based on various criteria, such as product models and rated power. Economies use different methods to categorize FLs, which makes it difficult to compare the level of energy efficiency. For example, Korea separated FLs into three categories by 20watt, 32watt and 40watt, and set efficacy criteria accordingly, while the US set efficacy criteria based on product type (4-foot, 8-foot), and ranged by correlated color temperature (CCT) (4500k, 7000K).

Recommendations

More than 10 members do not have standards or labels for FLs. IEC standards may provide opportunities to harmonize test methods for new development or revision of FL's standards.

Efficacy, lifetime, and lumen maintenance are key characteristics for FLs. To compare or harmonize these characteristics, economies could start with streamlining the product category definition.

Table 6 Fluorescent Lamps Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4782.1:2004; AS/NZS 4782.3 (Int):2006	AS/NZS 4782.2:2004: Double-capped fluorescent lamps - Performance specifications - Minimum Energy Performance Standard	None	None
Canada	CAN/CSA-C819-95 (2001)	MEPS for General Service Fluorescent Lamps	EnergyGuide	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps
Chile	NCh3010.Of2006 IEC 60064 (2005)	None	Energy Efficiency - Double-capped fluorescent - Classification and Labeling	None
	NCh3020.Of2006 IEC 60901 (2001)	None	Energy Efficiency – Single-capped fluorescent - Classification and Labeling	None
China		GB19043-2003 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for double-capped	n/a	Energy conservation certification rules for double-capped fluorescent lamps for general lighting service

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
		fluorescent lamps for general lighting service		
	GB 19415-2003; GB/T 17262	GB 19415-2003 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for single-capped fluorescent lamps	n/a	China Energy Conservation Certification for single-capped fluorescent lamps
Japan	JIS C 7601, IEC 60901	Top Runner Program for Fluorescent Lamps	Label Display Program	Energy Saving Labeling Program
Korea	KS C 7601	MEPS for Fluorescent Lamp	Energy Efficiency Label for Fluorescent Lamp	High-Efficiency Appliance Certification Programs for Fluorescent Lamps
Malaysia		n/a	n/a	Energy efficiency rating and labeling for electric lamps (fluorescent and LED lamps)
Mexico	NOM-058-SCFI; NMX-J-295-ANCE; NMX-J-531-ANCE	None	None	Sello FIDE Label for Fluorescent Lamps, T5, T8, and self-ballasted circular fluorescent lamps
New Zealand	AS/NZS 4782.1:2004	AS/NZS 4782.2:2004: Double-capped fluorescent lamps—Performance specifications—Minimum Energy Performance Standard (MEPS)	n/a	n/a
Peru	NTP 370101-2 2008	Peruvian Technical Standard NTP 370101-2 2008 Energy Efficiency for circular, linear, and compact fluorescent and similar lamps for household use	Energy Efficiency Label	None
Chinese Taipei	CNS 14125	MEPS for Self-ballasted Fluorescent Lamps	Under development	Energy Label Program for Fluorescent Lamps
		None	Under development	Energy Label Program for Fluorescent Lamps with Embedded Ballasts
Thailand	TIS 1713	TIS 2334-2550 (2007) Single-capped fluorescent lamps: energy efficiency requirements (voluntary standard)	None	None
	TIS 236	TIS 2309-2549 (2006) Double-Capped Fluorescent Lamps: Energy Efficiency Requirements (voluntary standard)	None	Energy Efficiency Label
The Philippines	PNS IEC 60081:2006	PNS 2050-1-1:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 1-1: Double-capped fluorescent lamps	PNS 2050-1-1:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 1-1: Double-capped fluorescent lamps	Efficient Lighting Initiative Program - Double-capped fluorescent lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	PNS IEC 60921:2001 Amd.01,02&03:2006	n/a	PNS 2050-1-2:2006 Lamps and related equipment - Energy labeling requirements - part 1-2: Single-capped fluorescent lamps	n/a
The US	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	EnergyGuide	n/a
Vietnam		n/a	n/a	TCVN 8249:2009 Tubular Fluorescent Lamps. Energy efficiency

4.3.3. Incandescent Lamps

Standards & Labels

Incandescent lamps include many product categories : incandescent tungsten lamps, incandescent reflector lamps, tungsten halogen lamps, etc. Australia, Canada, Korea, Chinese Taipei, the Philippines, and the US have issued mandatory standards for incandescent lamps. Canada, Chile, Korea, and the US launched mandatory label programs. There are not any voluntary labels for incandescent lamps.

Test standards

Existing standards use different test standards. Economies developed their own test methods for specific incandescent lamps. There is minimal convergence on test standards.

Level of Energy Efficiency

Efficacy is the key performance characteristic used to evaluate the energy efficiency for incandescent lamps. Most existing standards include criteria for it, but metrics vary. For example, Australia requires minimum initial lamp efficacy (in lm/W) for is given by the formula: 2.8 x ln(L) - 4.0 (where ln(L) is the natural logarithm of the measured initial luminous flux (in lumens)), while Canada's 'minimum average lamp efficacy' is rated according to power of different lamps.

Recommendations

Incandescent lamps have been used worldwide for many years. Now, more and more economies have decided or just are considering replacing incandescent lamps with CFLs or other efficient lamps in the market. However, for the economies where the incandescent lamps are still dominating the market, there is still opportunity to increase energy efficiency by setting high-level standards. Furthermore, referencing or adopting existing international test standards will provide increased opportunities for international trade of Incandescent lamps.

Table 7 Incandescent Lamps Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4934.1-2008 (Int):2008	AS/NZS 4934.2-2008 (Int): Incandescent lamps for general lighting services - Minimum energy performance standard requirements	None	None
Canada	CAN/CSA-C862-01 (ANSI C78.21 Table 1 of Part II for lamp class)	MEPS for General Service Incandescent Reflector Lamps, ER and BR Lamps	EnerGuide	None
Chile	NCh3010.Of2006 IEC 60064 (2005)	None	Energy Efficiency - Incandescent Tungsten Filament - Classification and Labeling	None
Korea	KS C 7501	MEPS for Incandescent Lamp	Energy Efficiency Label for Incandescent Lamp	n/a
Chinese Taipei	CNS 3891, CNS 11006, CNS5513	MEPS for Incandescent Lamps	N/A	n/a
The Philippines	n/a	PNS 2050-6:2010 - Lamps and related equipment - Energy labeling requirements - Part 6: Incandescent lamps for domestic and similar general lighting purposes	n/a	n/a
The US	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	Energy Guide	n/a

4.3.4. High Intensity Discharge (HID) Lamps

Standards & Labels

High intensity discharge (HID) lamps include metal halide, high pressure sodium, and mercury vapor lamps. These lamps are commonly used for outdoor lighting or commercial lighting. There is a trend for using low-watt metal halide lamps for indoor applications as well. Currently, the standards and labeling systems for these lamps are not moving as fast as the marketplace requires. There are only five economies that have launched energy efficiency standards and label programs. Among these, China and the US have issued mandatory energy efficiency standards for HID lamps. The Philippines has mandatory labels for HID. In addition, Korea is running a voluntary label for one type of HID lamp – the Metal Halide Lamp, Vietnam has voluntary scheme for High Pressure Vapour Lamps, Mexico and China launched voluntary programs for two types of HID lamps – Metal Halide Lamps and High-Pressure Sodium Vapour Lamps. China has mandatory standards for these two type of lamps.

Test Standards

Test standards are the basis for analysis and comparison of the performance of products. The same test standards can provide comparable results. The current existing standards use different test

methods. So far, only The Philippines has adopted IEC series test standards for its Mandatory Label program. This indicates very slight convergence between existing programs.

Level of Energy Efficiency

The performance level is related to lamp power. China set up the performance grades based on rated power. For instance, China Mandatory Standards only covers high-watt Metal Halide lamps, from 175W to 1,000W. The energy efficiency grades are set as below.

China: The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Metal-Halide Lamps

Rated power (W)	Minimum initial light efficiency (lm/W)		
	EE Grade		
	1	2(HEPS)	3(MEPS)
175	86	78	60
250	88	80	66
400	99	90	72
1000	120	110	88
1500	110	103	83

Recommendations

Compared to the large market and wide-use of HID lamps, the energy efficiency standard or energy efficiency labeling program is not developing as fast as needed to regulate the market by removing the low performance products and promoting high performance ones. However, this also provides a good opportunity for those economies that do not have standards or labels to work together to develop or adopt harmonized test standards and further energy efficiency standards.

Table 8 HID Lamps Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
China	GB 20054-2006	GB 20054-2006 - The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for metal- halide lamps	N/A	China Energy Conservation Certification for metal-halide lamps
	GB 19573-2004; GB/T 13434	GB 19573-2004 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for high-pressure sodium vapour lamps	China Energy Label for high-pressure sodium vapour lamps	China Energy Conservation Certification for high-pressure sodium vapour lamps
Korea				High-Efficiency Appliance Certification Programs for Metal-halide Lamps
Mexico	NMX-J-530-ANCE; NMX-J-531-ANCE; NMX-J-559-	None	None	Sello FIDE Label for HID Lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	ANCE			
The Philippines	PNS IEC 61167:2006; PNS IEC 60188:2006; PNS IEC 60192:2006; PNS IEC 60357:2006; PNS IEC 60662:2006; PNS IEC 62035:2006;	N/A	PNS 2050-3:2007 Lamps and related equipment - Energy efficiency and labeling requirements - Part 3: High intensity discharge (HID) lamps	N/A
The US	Under development	10 CFR Part 431: Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment: Final Determination Concerning the Potential for Energy Conservation Standards for High-Intensity Discharge (HID) Lamps- effective January 1st, 2015.	EnergyGuide	NA
Vietnam	TCVN7451-2:2005;TCVN 7670:2007	N/A	N/A	TCVN 8250:2009 High-pressure Sodium Vapor Lamps. Energy efficiency

4.3.5. Solid State Lighting (SSL)

Standards & Labels

Solid State Lighting (SSL) is currently a “hot” lighting product in the market. It is well-known by its high energy efficiency and long lifetime. The SSL technology and market are developing rapidly. The SSL can be used for residential, commercial, and industrial purposes. It can be used in many applications, for instance, indoor lights, decorative lights, street lights, traffic lights, etc. However, although the market is developing very rapidly, the establishment of standards is lagging behind. Currently, only Malaysia, Korea, Mexico and the US have launched voluntary labeling programs, and there is no mandatory standard in the place.

Test Standard

Different from the traditional lighting, SSL is very new and typically combines with other technologies, e.g. electronics, controllers. This indicates that more work and effort is needed to develop the SSL test standards. IEC has published serious standards, and the US has also issued several standards for testing, e.g. IESNA LM-79-08 Electrical and Photometric Measurement of Solid State Lighting Products and IESNA LM-80-08, Approved Method for Measuring Lumen Maintenance of LED Light Sources. However based on the information we obtained from the APEC economies, there is not any convergence in terms of test standards.

Level of Energy Efficiency

Energy performance varies among lamp types. Currently, each existing energy efficiency specification in each of the APEC economies covers different individual lamp types, including LED lamps, LED traffic lights, LED internal & external converters, SSL luminaires and integral LED lamps. From this moment, it doesn't make sense to compare the energy efficiency level of different lamp types. However, the current standards can serve as a reference for those that are considering developing relevant SSL standards. For instance, ENERGY STAR requires the following items: lumen output, luminaires efficacy, lumen maintenance, and life, color rendering index (CRI), correlated color temperature (CCT) and power factor, etc, as the key performance criteria.

Recommendations

The SSL technology and market is fairly new, and the relevant standards and energy efficiency labeling programs are not in the place yet. There are good opportunities for economies to collaborate on the harmonization of test standards, performance standards, and energy efficiency standards. Currently, the various international organizations, economies, industry associations, and testing labs are working on different standards. APEC groups can also actively facilitate the harmonization, and lead the efforts, as appropriate, to collaborate with other international organizations. The harmonization can be less complicated and easier if is started at the early stage of technology development.

Table 9 Solid State Lighting Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Malaysia	MS IEC 60969:2006	NA	NA	Energy efficiency rating and labeling for electric lamps)
Korea		NA	NA	High-Efficiency Appliance Certification Programs for LED Traffic Lights
		NA	NA	High-Efficiency Appliance Certification Programs for LED Lamps (internal & external converter)
Mexico	IES-LM 31; NMX-J-198-ANCE	None	None	Sello FIDE Label for LED fixtures for roads and pedestrian areas; and for street lighting powered by PV systems
The US	LED Fixture: for LED ANSI C78.377-2008;ANSI C79.1–2002;ANSI C78.20 – 2003; ANSI C78.21 – 2003; ANSI C78.21 – 2003; ANSI/IEC C81.61-2003; ANSI/IEEE C62.41 – 1991 (01- May-1991); CIE Publication No. 13.3 – 1995; CIE Publication No. 18.2 – 1983; IESNA LM-16	NA	NA	ENERGY STAR for Solid State Lighting Luminaires
	IESNA LM-79-08 IESNA LM-80-08 CIE Publication No. 13.3 – 1995 ANSI/IEEE C62.41 (01-	NA	NA	ENERGY STAR Integral LED Lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	May-1991 FCC 47 CFR including Part 2 and Part 18			

4.3.6. Ballasts

Standards & Labels

The ballast is the important component for the lighting system. The different lamp types require different ballast, e.g. ballasts for fluorescent lamps, ballasts for metal-halide lamps. Currently, many APEC economies focus on the most widely used ballasts for fluorescent lamps. Seven economies – Australia, Canada, China, Malaysia, New Zealand, Korea, and Chinese Taipei issued Mandatory Standards for fluorescent lamps, but only Korea has mandatory labels which correspond to these standards. Besides this, there are seven economies – China, Malaysia, Korea, Mexico, Thailand, Philippines and Vietnam that are running voluntary programs for ballast for FLs.

For other types of ballasts, China uses mandatory standards to regulate the ballasts for high-pressure sodium lamps and metal halide lamps, and has launched a corresponding voluntary labeling program. Korea set up MEPS and mandatory labels for associated ballasts. Hong Kong and Thailand have voluntary schemes for electronic ballasts to transform the market.

Test Standard

For other lighting products, economies tend to develop their own test method. Given the information below, there are more than ten different methods to test ballasts for FLs. This leads to an incomparable results among different economies, and also brings barriers for trade. But we still can see a good sign that Australia, Malaysia, Philippines and Vietnam are adopting or partially adopting IEC 60929: *AC-supplied electronic ballasts for tubular fluorescent lamps - Performance requirements* for their test standards, although each refers to different versions.

Level of Energy Efficiency

Although the ballasts for FLs do not have many differences among the different economies, the current standards have different matrices to evaluate the performance – which sets up a barrier to directly analyze and compare the energy efficiency of ballasts from different economies. For examples, China is using the Ballast Efficiency Factors (BEF) to evaluate the energy efficiency of the ballast. The BEF is an index calculated by

BEF = (μ/P)*100,
μ is ballast lumen factor
P is wattage of circuit.

Based on the calculation, China MEPS and High Efficiency Purification Systems (HEPS) for tubular FLs ballast are as follows:,

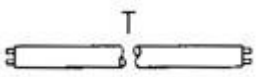
MEPS for tubular fluorescent lamps ballast								
Nominal power(W)		18	20	22	30	32	36	40
BEF	Magnetic	3.154	2.953	2.77	2.232	2.146	2.03	1.992

	Electronic	4.778	4.37	3.998	2.87	2.678	2.402	2.27

HEPS for tubular fluorescent lamps ballast								
Nominal power(W)		18	20	22	30	32	36	40
BEF	Magnetic	3.686	3.458	3.248	2.583	2.461	2.271	2.152
	Electronic	5.518	5.049	4.619	3.281	3.043	2.681	2.473

While, Australia and New Zealand marked the energy efficiency by another calculated index – the Energy Efficiency Index (EEI).

Australian/New Zealand MEPS Ballasts for FLs – EEI classification for rated voltage>250V

Lamp type and arrangement	Nominal lamp power* Watts	ILCOS code	Maximum corrected total input power, Watts						
			Energy Efficiency Index (EEI) classification						
			A1#	A2	A3	B1	B2	C	D
Linear 	15	FD-15-E-G13-26/450	≤18.0	≤16.0	≤18.0	≤21.0	≤24.0	≤25.0	>25.0
	18	FD-18-E-G13-26/600	≤21.0	≤19.0	≤21.0	≤24.0	≤27.0	≤28.0	>28.0
	30	FD-30-E-G13-26/895	≤33.0	≤31.0	≤33.0	≤36.0	≤39.0	≤40.0	>40.0
	36	FD-36-E-G13-26/1200	≤38.0	≤36.0	≤38.0	≤41.0	≤44.0	≤45.0	>45.0
	38	FD-38-E-G13-26/1047	≤40.0	≤38.0	≤40.0	≤43.0	≤46.0	≤47.0	>47.0
	58	FD-58-E-G13-26/1500	≤59.0	≤55.0	≤59.0	≤64.0	≤68.0	≤70.0	>70.0
	70	FD-70-E-G13-26/1800	≤72.0	≤68.0	≤72.0	≤77.0	≤81.0	≤83.0	>83.0

NOTES:
1. Refer to AS/NZS 61231, International lamp coding system (ILCOS)
2. Applies only to mains frequency ferromagnetic ballasts with two-wire connection and with an external starter.

Recommendations

The ballasts for FLs are a technically mature product and used widely. IEC has published a series of standards which have been adopted or referenced by some APEC economies, and this brings a common foundation for test standard harmonization. For those that are developing or about to develop standards for FL ballasts, the IEC standards are good references to think about. In addition, harmonizing the evaluation metric is also important.

Table 10 Ballasts Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4783.1:2001 (IEC60921, IEC 60929)	AS/NZS 4783.2:2002 MEPS Requirements for Ballasts for Linear Fluorescent Lamps	n/a	n/a
Canada	CAN/CSA-C654-M91(amended 2001)	MEPS for Fluorescent Lamp Ballasts	n/a	n/a
China	GB17896-1999; GB/T15144-1994	GB17896-1999 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for tubular fluorescent lamps ballast	n/a	China Energy Conservation Certification for tubular fluorescent lamps ballast
	GB 19574-2004; IEC60925; GB/T 13434	GB 19574-2004 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for ballast for high-pressure sodium lamp	n/a	China Energy Conservation Certification for ballast for high-pressure sodium lamp
	GB 20053-2006	GB 20053-2006 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for ballast of metal- halide lamps	n/a	China Energy Conservation Certification for ballast for metal- halide lamps
Hong Kong, China	EN 50294	none	None	Voluntary Energy Efficiency Labeling Scheme for Electronic Ballasts
Malaysia	MS 1778: Part 1:2005 Voluntary Label: MS 141: Part 2 :1993 & MS IEC 929 :1995	MS 1778: PART 2:2005 Electrical lighting equipment - Ballasts for fluorescent lamps - Part 2: Energy labeling and minimum energy performance standard requirements	n/a	Energy efficiency rating and labeling for ballasts for fluorescent lamps
Mexico	NOM-058-SCFI; NMX-J-198-ANCE; NMX-J-513-ANCE	None	None	Sello FIDE Label for CFL ballasts, HID lamp ballasts, T5 ballasts, T8 ballasts
New Zealand	AS/NZS 4783.1:2001: Performance of electrical lighting equipment—Ballasts for fluorescent lamps—Method of measurement to determine energy consumption and performance of ballasts lamp circuits	AS/NZS 4783.2:2002: Performance of electrical lighting equipment—Ballasts for fluorescent lamps—Energy labeling and minimum energy performance standards requirements	n/a	n/a
Korea	KS C 8102	MEPS for Fluorescent Lamps Ballast	Energy Efficiency Label for Fluorescent Lamps Ballast	High-Efficiency Appliance Certification Programs for Ballasts (including Ballasts for 26mm 32W fluorescent lamps, Ballasts for 16mm fluorescent lamps, Ballasts for FPL 32W compact

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
				fluorescent lamps, Electronic ballasts for metal halide lamps, Electronic b
	KS C 7621	MEPS for Associated Ballast	Energy Efficiency Label for Associated Ballast	
Chinese Taipei	CNS13755	MEPS for Fluorescent Lamp Ballasts	n/a	n/a
Thailand	TIS 885-2532, TIS 1506-2542; TIS 1506-2541; IEC 60929 Electronic ballasts for T5	None	None	Energy Efficient Ballast Program - Electronic Ballasts for T5
	TIS 23-2521 (1978) Magnetic ballasts	None	None	Energy Efficient Ballast Program - Magnetic Ballasts For Fluorescent Lamps
The Philippines	PNS IEC 60929:2006; PNS IEC 60921:2006	n/a	PNS 2050-4:2007 Lamps and related equipment - Energy labeling requirements - part 4: Ballast	Efficient Lighting Initiative Program - Ballast for double-capped fluorescent lamps
Vietnam	TCVN7541-2:2005;TCVN 7590-2-8:2006(IEC 61347-2-8:2006); TCVN 6479:2006(IEC 60921:2004)	n/a	n/a	TCVN 8248:2009 Electromagnetic Ballasts for Fluorescent Lamps. Energy efficiency
	TCVN 7541-2:2005; TCVN 7673:2007(IEC 60969:2001); TCVN7863:2008(IEC60901:2004)	n/a	n/a	TCVN 7897:2008 Electronic ballasts for fluorescent lamps. Energy efficiency

4.3.7. Other Lighting Products

Besides the lighting products mentioned in the sections above, there are still a number of other types of lamps or lamp equipment used in APEC regions, such as torchieres from Canada and the US, lighting systems used in non-residential buildings from Mexico, ceiling fans from Canada and the US. Each economy sets up mandatory standards and/or energy efficiency labeling programs corresponding to the mandatory standard.

Recommendations

Like other products, test standards form the basis for harmonization. For new product types, there is the opportunity for economies to work together for a unique test standard. Based on the comparable test result given by harmonized test standards, participants can work for the evaluation metric and performance level for the harmonization of energy efficiency standards.

Table 11 Other Lighting Products Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Canada	IESNA LM45 for lamp lumen output and wattage; IESNA LM49 for lamp life; CIE 13.3 for lamp Color Rendering Index (CRI)	MEPS for General Service Lamps(January 1, 2012 and December 31, 2012 for minimum performance)	EnerGuide	

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
	CSA C22.2 No. 12 Voluntary Label: US ENERGY STAR Test Methods	MEPS for Torchieres	None	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps
	CSA C22.2 No. 9 Voluntary Label: US ENERGY STAR Test Methods	MEPS for Ceiling Fan Lighting	None	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps
Chile				Replacement GU-24 Base Integrated Lamps
Mexico	NOM-013-ENER-2004; IES LM-31; IES LM-79; IES LM-46; IES LM-41; NMX-J-198-ANCE; NMX-J-507/1-ANCE	Energy efficiency for lighting systems in public roadways and outdoor areas	None	Sello FIDE label for street lighting fixtures, outdoor lighting fixtures, indoor luminaires, integrated fixtures with LEDs and industrial use lighting, induction lamps, occupancy sensors
	NOM-007-ENER-2004	Energy efficiency for lighting systems in non-residential buildings	None	
Korea				High-Efficiency Appliance Certification Programs for Reflectors for fluorescent lamps and HID lamps
				High-Efficiency Appliance Certification Programs for Sensor lighting equipment
Chinese Taipei				Energy Label Program for Indoor Light Fixtures
				Energy Label Program for Exit Lights and Emergency Direction Lights
The Philippines	PNS IEC 60598-1:2006;	n/a	PNS 2050-5:2007 - Lamps and related equipment - Energy labeling requirements - Part 5: Luminaires	
The US				ENERGY STAR for Residential Light Fixtures
	Appendix AA to Subpart B of Part 430,	EPACT 2005. 10 CFR Parts 430 Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment (Torchiere Lighting Fixtures)	EnergyGuide	n/a
	Appendix U to Subpart B of Part 430	10 CFR Parts 430 Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment 10 CFR Part 430 Energy Conservation Standards for Certain Ceiling Fan Light Kits	EnergyGuide	EPA's ENERGY STAR Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans.

4.4. Computers and Monitors

4.4.1. Computers

Standards & Labels

Few APEC economies have established mandatory programs for computers other than Korea's warning label and Japan's Top Runner program (mandatory standard), whose launch is targeted for 2011. ENERGY STAR has been introduced as a voluntary label in five economies – Australia, Canada, Japan, New Zealand, and the US. Additionally, China, Hong Kong, and Korea have developed their own voluntary programs. Thailand has been developing MEPS and HEPS of standby power for computers. The Philippines and Indonesia are considering launching programs for computers. Australia is considering launching mandatory MEPS for computers from as early as 2011.

Test Procedures

US EPA test methods are widely adopted across member economies. Only China and Hong Kong, China use their own test methods and Korea adopts IEC 62301. The current situation presents a high potential for convergence.

Mode of Energy Use

US EPA tests have detailed requirements for different kinds of computers and measure energy performances in four modes: off, sleep, idle and active. Hong Kong, China classifies computers in three types and measures only the sleep mode. Korea's e-standby program measures a Maximum Continuous Output Power Rating[3] and power consumption during the low-power/sleep mode.

ENERGY STAR
Qualifications

Products Covered by Version 5.0 Specification	Products Not Covered by Version 5.0 Specification
• Desktop Computers • Integrated Desktop Computers • Notebook Computers • Workstations • Game Consoles • Small-Scale Servers • Thin Clients	• Computer Servers (as defined in Version 1.0 Computer Server specification) • Handhelds, PDAs, and Smartphones

[3] The total amount of power consumption, on a voltage output basis, when the various parts of a computer simultaneously use the same power source, and is indicated as the total amount of current (A) x electric voltage (V).

Hong Kong, China (Voluntary Scheme)

Table 1: Appliance Classification

Category	Description
A	Computers that are shipped with the capability to be on networks such that they can remain in their sleep mode while their network interface adapter retains the ability to respond to network queries. Computers that are not shipped with a network interface capability. Computers shipped to a non-networked environment. Computers sold or marketed as personal computers.
B	Computers that are shipped with the capability to be on networks that currently require the computer's processor and/or memory to be involved in maintaining its network connection while in sleep mode. These computers are expected to maintain identical network functionality in and out of sleep mode.
C	Integrated Computer System (computer and monitor are combined into a single unit).

Korea (e-Standby criteria)

Table 3(from 1 Jan 2003)

Classification		Default Time	Low-power mode
Computers (including Notebook computer)	**P** d 400W	d30 minutes	d10.0W
	P > 400W	d30 minutes	d10% of **P**
Integrated Computer System		d30 minutes	d15.0W

-**P :** maximum continuous output power rating of the power supply

Recommendation

There is existing convergence in computer standards among the APEC economies, which presents a unique opportunity for APEC to facilitate further harmonization. Since most economies currently have programs for computers involving US EPA test methods, it is recommended that other member economies follow suit.

Table 12 Computers Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	US EPA Energy Star tests	Under development	None	ENERGY STAR - Computers
Canada	US EPA Energy Star tests	None	None	ENERGY STAR - Computer
China	CQC3114-2009	under development	None	China Energy Conservation Certification for computers
Hong Kong, China		None	None	Voluntary Energy Efficiency Labeling

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
				Scheme for Computers
Indonesia		under development	None	None
Japan	Public notice	Top Runner for Computers	Label Display Program	Energy Saving Labeling Program
	US EPA tests	None	None	Energy Star - computers
Mexico			Under development	
New Zealand	US EPA tests			ENERGY STAR - computers
Korea	KS C IEC 62301	n/a	E-Standby Power Program for Computers (Warning Label)	E-Standby Power Program for Computers (High Standby Power Reduction Potentials)
Thailand	IEC 62301	Under development	None	None
The Philippines		Under development	None	None
The US	US EPA tests	None	None	ENERGY STAR- Computer

4.4.2. Monitors

Standards & Labels

Only a handful of economies have created or are considering mandatory programs for monitors. Programs and stringency varies across economies (mandatory standard in China and a warning label in Korea). ENERGY STAR as a voluntary label has been adopted in four economies – Australia, Japan, New Zealand, and the US. In addition, China, Hong Kong, China, Korea, Mexico Chinese Taipei, and Thailand have developed their own voluntary programs. Australia is currently considering mandatory MEPS and labeling for monitors beginning as early as 2011.

Test Procedures

Similar to computers, US EPA test methods are widely adopted across member economies. EPA test methods in this specification are based on standards from the Video Electronics Standards Association (VESA) Display Metrology Committee and the International Electrotechnical Commission (IEC). In cases where the VESA and IEC standards were insufficient for the needs of the ENERGY STAR program, additional testing and measurement methods were developed in cooperation with industry stakeholders.

Korea and Thailand adopt the IEC 62301 standard and Chinese Taipei utilizes a combination of IEC and ENERGY STAR test methods. Only China, Hong Kong and Mexico have their own test methods. This indicates a high potential for convergence.

Mode of Energy Use

Various modes of energy use are used to determine performance of monitors in member economies. For instance, both under the ENERGY STAR program, Australia measures power consumption in low-power sleep mode and deep sleep mode, whereas New Zealand and the US look at on mode and sleep/off mode. Since the modes of energy use are different, it will be a challenge to compare criteria for the energy efficiency level.

Australia

Key Product Criteria - Monitors (effective 1 July 2000)		
Low-Power Mode	**First Low-Power "Sleep Mode"**	**Second Low-Power "Deep Sleep" Mode**
Maximum Watts in Low-Power State	< 15 W	< 8 W

China

The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Computer Monitors

Type	EE Grade					
	1		2(HEPS)		3(MEPS)	
	EE(Cd/W)	energy consumption of off mode	EE(Cd/W)	energy consumption of off mode	EE(Cd/W)	energy consumption of off mode
CRT	0.18	1	0.16	3	0.14	5
LCD	1.05	0.5	0.85	1	0.55	2

ENERGY STAR

On-Mode Requirements

Table 1. Tier 1 On Mode Power Consumption Requirements

Display Category	Maximum On Mode Power Consumption (W)
Diagonal Screen Size < 30 inches Screen Resolution ≤ 1.1 MP	$P_O = 6^*(MP) + 0.05^*(A) + 3$
Diagonal Screen Size < 30 inches Screen Resolution > 1.1 MP	$P_O = 9^*(MP) + 0.05^*(A) + 3$
Diagonal Screen Size 30 - 60 inches All Screen Resolutions	$P_O = 0.27^*(A) + 8$

MP = Display Resolution (megapixels)
A = Viewable Screen Area (square inches)

Sleep and Off-Mode Requirements

Table 3. Sleep and Off Mode Power Consumption Requirements for all Displays

Mode	Tier 1	Tier 2
Maximum Sleep Mode Power Consumption (W)	≤ 2	≤ 1
Maximum Off Mode Power Consumption (W)	≤ 1	≤ 1

Recommendation

There is existing convergence in computer standards among the APEC economies, which presents a unique opportunity for APEC to facilitate further harmonization. This can start from first harmonizing the modes of energy use, then the levels of energy efficiency. It is recommended that any other economy who is considering launching a program for monitors adopt test standards from either EPA or IEC, given their prevalence in existing programs.

Table 13 Monitors Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	US EPA Energy Star tests	Under development	Under development	ENERGY STAR - Monitors
China	GB 21520-2008	Minimum Allowable Values of Energy	China Energy Label - Computer Monitors	China Energy Conservation

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
		Efficiency and Energy Efficiency Grades for Computer Monitors		Certification for computer monitors
Hong Kong, China		None	None	Voluntary Energy Efficiency Labeling Scheme for LCD Monitors
Indonesia		Under development	None	None
Japan	US EPA tests	None	None	ENERGY STAR for Monitors
Mexico	NMX-I-163-NYCE		Under development	Sello FIDE for personal computer monitors
New Zealand	US EPA tests	None	None	ENERGY STAR program for Displays
Korea	KS C IEC 62301	N/A	E-Standby Power Program for Monitors (Warning Label)	E-Standby Power Program for Monitors (High Standby Power Reduction Potentials)
Chinese Taipei	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	None	None	Energy Label Program for Monitors
Thailand	IEC 62301	None	None	Energy Efficiency Label (pilot project)
The US	10 CFR Part 430 Subpart B App H , US ENERGY STAR	None	None	ENERGY STAR - Displays (Versions 4.1 and 5.1 specifications have been finalized. Effective date for 4.1 is May 1, 2010, for 5.1 is May 1, 2012)

4.5. Televisions

Standards & Labels

Voluntary labeling is playing a key role in the APEC region – as eleven economies, including Canada, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Chinese Taipei, Thailand and the US have voluntary schemes to promote energy-efficient televisions. The ENERGY STAR program is also used for Televisions in the US, Canada, and New Zealand. Mexico also has a voluntary label for TV receivers.

Three member economies—Australia, China and Japan—have issued a mandatory standard. Canada has MEPS for standby power that includes televisions. Indonesia, Russia, Thailand and the Philippines are considering development of mandatory standards. Mandatory labels have been launched in four economies—Australia, China, Japan and Korea—and Canada is developing a label that will become effective in 2011.

Test Procedures

Although the specific test procedures vary from member to member, IEC standards, e.g. IEC 62087 *Ed. 2.0, Methods of measurement for the power consumption of audio, video and related equipment*, IEC 62301 *Household electrical appliances - Measurement of standby power* and IEC *60107-1 Methods of measurement on receivers for television broadcast transmissions* are partly referenced or directly adopted by existing standards.

Level of Energy Efficiency

Generally, energy efficiency of televisions can be measured under three power modes including On-Mode, Passive Standby Mode (or Sleep Mode), and Active Standby Mode (or Downloads Acquisition Mode). Most existing standards have the criteria for the power consumption of Passive Standby Mode and set up 1.0 watt as the maximum value. For some economies such as Australia or US ENERGY STAR, an Active Standby Mode or Downloads Acquisition Mode is defined to indicate the power mode that the television is not producing any pictures or sound but is performing other functions such as downloading electronic program guides, monitoring for emergency messaging/communications, and/or otherwise communicating through a network protocol. Some economics require on-mode power consumption criteria with various indexes and equations across economies.

Here, we can take four typical means for determining energy efficiency levels as examples, respectively for China, Australia, US ENERGY STAR and Japan.

For **China**, the standby mode power is set as one of the MEPS requirements, and the energy efficiency rating is based on energy efficiency index (EEI) of On Mode. The calculation methods are as follows which differs for liquid crystal display (LCD) and plasma display panel (PDP).
The definition of energy efficiency is:

$$Eff = \frac{L \times S}{P_k - P_S}$$

Here Eff is the energy efficiency of flat panel, cd/W;
L is the average luminance of the screen, cd/m^2;
S is the effective illumination area of the screen, m^2;
P_k is On Mode power, W;
Ps is signal processing power, W. For YP_BP_R input, it is 6W; for analog RF input, it is 10W; for digital RF input, it is 17W.
Then the EEI for LCD is as follows:

$$EEI_{LCD} = \frac{Eff}{Eff_{LCD,ref}}$$

EEI_{LCD} is the energy efficiency index for LCD;

$Eff_{LCD,ref}$ is the reference energy efficiency index, which is 1.10cd/W.

The EEI for DPD is as follows:

$$EEI_{PDP} = \frac{Eff}{Eff_{PDP,ref}}$$

EEI_{PDP} is the energy efficiency index for PDP;

$Eff_{PDP,ref}$ is the reference energy efficiency index, its values are defined below:

Inherent resolution (No. of pixels)	Horizontal inherent resolution > or = 1920, and vertical inherent resolution > or = 1080	others
$Eff_{PDP,ref}$ (cd/W)	0.320	0.450

The energy efficiency grades are defined as follows:

Energy Efficiency Grade for Flat Panel Televisions			
Energy Efficiency Index (EEI)	Energy Efficiency Grade		
	1	2(HEPS)	3(MEPS)
EEILCD	1.4	1.0	0.60
EEIPDP	1.2	1.0	0.60

For **Australia**, the MEPS and star rating for televisions are based on Annual Energy Consumption or Comparative Energy Consumption (CEC), which is calculated from the specific usage pattern of the three main modes. The energy efficiency of a television is defined as a function of the annual energy consumption and the screen area described as follows. (For televisions the Base Energy Consumption (BEC or 1 star line) is also the Tier 1 MEPS line which came into force on 1 October 2009.)

BEC=127.75 + (0.1825 × screen area), where screen area is in cm^2 and BEC is in kWh/year.

$$SRI = 1 + \left[\frac{\log\left(\frac{CEC}{BEC}\right)}{\log(1 - ERF)}\right]$$

SRI is the star rating index (fractional star rating);
CEC is the comparative energy consumption (energy that appears on the energy label);
BEC is the base energy consumption – the equation for a product with an SRI of 1.0
ERF is the energy reduction factor – reduction in CEC for each additional star
For televisions, an Energy Reduction Factor (ERF) is set to 0.20, which represents a 20% reduction in annual energy consumption per additional star.

For **US ENERGY STAR**, the energy efficiency criteria sets out separate requirements for various scenarios, including On-Mode power consumption criteria, TVs with Automatic Brightness Control (ABC), Sleep Mode power consumption criteria, Download Acquisition Mode (DAM). On-Mode Power Consumption Requirements' equations are shown in the table below, where "A" is the viewable screen area of the product, calculated by multiplying the viewable image width by the viewable image height.

Version 4.1: Effective May 1, 2010		
Screen Area	**Maximum On Mode Power Consumption in Watts (A expressed in square inches)**	**Maximum On Mode Power Consumption in Watts (A expressed in square centimeters)**
A < 275 square inches (1774 square centimeters)	$P_{Max} = 0.190*A + 5$	$P_{Max} = 0.029*A + 5$
A ≥ 275 square inches (1774 square centimeters)	$P_{Max} = 0.120*A + 25$	$P_{Max} = 0.019*A + 25$
Version 5.1: Effective May 1, 2012		
Screen Area	**Maximum On Mode Power Consumption in Watts (A expressed in square inches)**	**Maximum On Mode Power Consumption in Watts (A expressed in square centimeters)**
A < 275 square inches (1774 square centimeters)	$P_{Max} = 0.130*A + 5$	$P_{Max} = 0.020*A + 5$
275 ≤ A ≤ 1068 square inches (6890 square centimeters)	$P_{Max} = 0.084*A + 18$	$P_{Max} = 0.013*A + 18$
A > 1068 square inches (6890 square centimeters)	$P_{Max} = 108$	

If the TV has a Download Acquisition Mode (DAM) function the additional maximum allowable energy of a product when in DAM is noted in table below.

Specification Version	Maximum Allowable Energy in DAM (kilowatt-hours/day)
Version 4.1: Effective May 1, 2010	0.08
Version 5.1: Effective May 1, 2012	0.02

For **Japan Top Runner Program**, televisions are classified to detailed categories to provide standard energy consumption efficiency or calculation formula for each category. An example for ones whose target year is Fiscal Year 2012 or any subsequent fiscal year for Liquid Crystal TV sets and plasma TV sets including 64 categories.

(3) Ones whose target year is FY 2012 or any subsequent fiscal year
○ Liquid crystal TV sets and plasma TV sets (64 categories)

Category					Standard energy consumption efficiency or calculation formula thereof
No. of pixels	Television receiver size	Dynamic image display	Additional function(s)	Category name	
FHD	Below 19 V size	Liquid crystal normal	Other than the following	DA	E=59
			With 1 function	DA1	E=71
			With 2 functions	DA2	E=83
			With 3 functions	DA3	E=95
		Liquid crystal double speed	Other than the following	DB	E=74
			With 1 function	DB1	E=86
			With 2 functions	DB2	E=98
			With 3 functions	DB3	E=110
	Not below 19 V size, but below 32 V size	Liquid crystal normal	Other than the following	DC	E=2.0S+21
			With 1 function	DC1	E=2.0S+33
			With 2 functions	DC2	E=2.0S+45
			With 3 functions	DC3	E=2.0S+57
		Liquid crystal double speed	Other than the following	DD	E=2.0S+36
			With 1 function	DD1	E=2.0S+48
			With 2 functions	DD2	E=2.0S+60
			With 3 functions	DD3	E=2.0S+72
		Liquid crystal quadruple speed or plasma	Other than the following	DE	E=2.0S+58
			With 1 function	DE1	E=2.0S+70
			With 2 functions	DE2	E=2.0S+82
			With 3 functions	DE3	E=2.0S+94
	32 V size or larger	Liquid crystal normal	Other than the following	DF	E=6.6S-126
			With 1 function	DF1	E=6.6S-114
			With 2 functions	DF2	E=6.6S-102
			With 3 functions	DF3	E=6.6S-90
		Liquid crystal double speed	Other than the following	DG	E=6.6S-111
			With 1 function	DG1	E=6.6S-99
			With 2 functions	DG2	E=6.6S-87
			With 3 functions	DG3	E=6.6S-75

E: standard energy consumption efficiency (kilowatt-hours (kWh) per year)
S: television receiver size (refers to the centimeter-denominated quotient, rounded at the decimal point, of division of the diagonal dimension of the driven display area of the display screen by 2.54)

Recommendations

IEC test procedures for on-mode power consumption and standby power are internationally-recognized methods for measuring power consumption of different operating modes. Reference IEC standards is the basic foundation of further harmonization efforts.

Although the levels of energy efficiency are divergent in the region, the requirement on standby power is set in many existing voluntary and mandatory programs, and the criteria are same (no more than one (1.0) watt), which is a convenient reference for economies developing or planning to develop programs for televisions.

Table 14 Televisions Cross-Economy-Product Matrix

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 62087.1:2010	AS/NZS 62087.1:2010: Power consumption of audio, video and related equipment, Part 2.2: Minimum energy performance standards (MEPS) and energy rating label requirements for television sets	Energy Labeling for Televisions	
Canada	CAN/CSA-C62301-07(Harmonized with IEC- 62301)	MEPS for Standby Power Consumption	Under development	ENERGY STAR Label, 4.1 and 5.1
China	GB12021.7-2005, GB/T 17309.1 (idt IEC 107-1 1995)	GB 12021.7-2005 - Limited values of energy efficiency and evaluating values of energy conservation (HEPS) for color television broadcasting receivers	n/a	Energy conservation certification for color television broadcasting receivers
	GB 24850-2010	GB 24850-2010: Minimum allowable values of energy efficiency and energy efficiency grades for flat panel televisions	China Energy Label - Flat Panel Televisions	Energy conservation certification rules for Flat Panel Televisions
Hong Kong, China		n/a	n/a	The Hong Kong, China Voluntary Energy Efficiency Labeling Scheme for TVs
Indonesia	IEC 60107-1; JIS C 6101-1	under development	n/a	Energy Efficiency Labeling for TV
Japan	JIS C 6101-1	Top Runner Program for Televisions	Label Display Program	Energy Saving Labeling Program
Malaysia	IEC 62087 Edition 2.0: 2008-10 for on mode power and MS IEC 62301:2006 for standby mode power	n/a	n/a	Energy efficiency rating and labeling for televisions
Mexico	NMX-I-122-NYCE	None	None	Sello FIDE for Television Receivers
New Zealand	ENERGY STAR Test Method	Under consideration	Under consideration	ENERGY STAR® program requirements for Televisions Versions 4.1 and 5.1
Korea	KS C IEC 62301	n/a	E-Standby Power Program for Televisions (Warning Label)	E-Standby Power Program for Televisions (High Standby Power Reduction Potentials)
Russia		Under development	n/a	n/a
Chinese Taipei	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	n/a	n/a	Energy Efficiency Criteria and Labeling Method for Energy Label Qualified Televisions

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Voluntary Label
Thailand	IEC 62301	Under development	None	Standby Power Program for Televisions (Energy Efficiency)
The Philippines		Under development	None	None
The US	10 CFR Part 430 Subpart B App H , US ENERGY STAR	None	None (FTC Proposes Requiring EnergyGuide Labels on TVs to Better Inform Consumers;)	ENERGY STAR - Television, Current Specification Effective Date: Version 4.1 - May 1, 2010 ; Version 5.1 - May 1, 2012

4.6. Clothes Washers and Dryers

4.6.1. Clothes Washers

Standards & Labels

About half of APEC members have created mandatory standards and labels for clothes washers and the Philippines are developing a program. In addition, seven economies – Canada, China, Hong Kong, Mexico, New Zealand, Chinese Taipei and the US - have voluntary schemes, among which Canada, New Zealand and the US share the ENERGY STAR program with their own modifications while the other three utilize their individual programs. In addition, Thailand is developing MEPS and HEPS for clothes washers. China and the United States will launch more stringent requirements for both mandatory and voluntary programs in 2011 and Hong Kong's mandatory label will become effective in the same year.

Test Procedures

Most large APEC economies, such as Australia, Canada, China, Mexico, and the US, have developed their own test standards, incorporating some parameters from international standards. However, smaller economies, such as Hong Kong, Indonesia, Korea, Malaysia and Chinese Taipei, tend to directly adopt IEC 60456 or the Japan Industrial Standard (JIS) 9606/9608, or both, as their test methods.

Product Scope

The product scope of washing machines are usually defined either by type (horizontal versus vertical), or by capacity (standard versus compact), in terms of rated capacity[4] or container volume. There are some additional characteristics of washing machines, for instance, whether it has a built-in dryer, whether it has a spin extraction, manual versus automatic, etc. Very few economies have the same product scope. For example, China, Hong Kong and Korea cover household washers of a certain rated capacity while Canada and the US include both household and commercial washers of certain tub volumes. Even among the three Asian neighbors, the rated capacities of their mandatory programs differ: 1~13kg for China, ≤7kg for Hong Kong and 2~15kg for Korea.

Energy Efficiency Level

Due to divergent product classification, it is difficult to compare the levels of energy efficiency among APEC economies. However, most economies tend to calculate an Energy Consumption Index, given by energy use during a complete cycle divided by Rated Washing Capacity, to determine a washing machine's efficiency. Only New Zealand and the US are exceptions, and require manufacturers to meet an energy use factor and a water use factor at the same time, rather than just one index.

Examples:

Canada (MEPS)

Household		
Energy efficiency standard		
Product class	**Minimum MEF (L/kWh/cycle)**	

[4] Rated Capacity means the mass in kilograms of a particular type of textiles.

	1-Jan-07	
Vertical-axis compact (less than 45-L capacity)	18.4	
Vertical-axis standard (45-L or greater capacity)	35.68	
Horizontal-axis*	35.68	
Suds-saving*	N/A	
MEF = modified energy factor.		
L/kWh/cycle = liters per kilowatt hour per cycle.		
*These product classes shall be equipped with an unheated rinse-water option.		
Commercial		
Clothes Washers	**Clothes Container**	**Minimum Modified Energy Factor (MEF) L/kWh/cycle (*ft^3/kWh/cycle*)**
Front-loading (horizontal-axis)	<99.3 L (3.5 ft^3)	35.68 (1.26)
Top-loading (vertical-axis)	<45 L (1.6 ft^3)	18.40 (0.65)
	>=45L and <113 L	35.68 (1.26)
	(>=1.6 ft^3 and < 4.0 ft^3)	

United States (Mandatory)

Clothes washers manufactured on or after January 1, 2007, shall have a modified energy factor no less than:

Product Class	Modified energy factor (cu.ft./kWh/cycle)
i. Top-Loading, Compact (less than 1.6 ft.^{3} capacity).	0.65.
ii. Top-Loading, Standard (1.6 ft.^{3} or greater capacity).	1.26.
iii. Top-Loading, Semi-Automatic.	[1] Not Applicable.
iv. Front-Loading	1.26.
v. Suds-saving	[1] Not Applicable.

[1] Must have an unheated rinse water option.

Hong Kong, China (MEELS)

(a) For horizontal drum type washing machine with built-in water heating device and impeller type or agitator type washing machine, the specific energy consumption is calculated as follows:

$$\text{Specific Energy Consumption } (E_{sp}) = \frac{E}{W_r} \quad \text{.....(eq. 1)}$$

where E = *measured energy consumption per cycle (kWh/cycle)*

W_r = *rated washing capacity (kg)*

(b) For horizontal drum type washing machine without built-in water heating device, the specific energy consumption is calculated as follows:

$$\text{Specific Energy Consumption } (E_{sp}) = \frac{E + W_h}{W_r} \quad \text{.....(eq. 2)}$$

where E = *measured energy consumption per cycle (kWh/cycle)*

W_r = *rated washing capacity (kg)*

W_h = *calculated hot water energy (kWh/cycle)*

New Zealand (ENERGY STAR)

	ENERGY STAR criteria
Energy consumption	SRI ≥ 3.5
Water consumption	WSRI ≥ 4.0

Recommendation

There is minimal convergence among the APEC group as a whole in terms of the standards, test procedures, product scopes and energy efficiency levels. Economies appear to determine which test method or product scope to adopt according to practices within their regional clusters, connection with major trading partners, and/or their own domestic conditions. There is a combination of factors that are taken into consideration. However, if the APEC members are going to align their practices for this specific product, there are a number of areas that offer good opportunities: First, for those who intend to export clothes washers to or import washers from the East Asian economies, IEC and JIS could be referenced or adopted for developing test procedures. Second, APEC can start to harmonize product scopes within one regional group of economies, the East Asian group, which collectively use washing capacity as a parameter, or the North American group, which use container size. Once the product scopes are harmonized, there will be greater potential to harmonize energy efficiency levels as their calculation methods are quite similar.

Table 15 Clothes Washers Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 2040.1:2005/Amdt1:2007	n/a	Energy Labeling for Clothes Washers	n/a
Canada	CAN/CSA-C360-03	MEPS for clothes washers (Voluntary on household-style commercial clothes washers)	EnerGuide Label	ENERGY STAR
China	GB12021.4-2004	Minimum allowable values of the energy efficiency and energy efficiency grade for household electric washing machines	China Energy Label - Clothes Washers (Electric)	China Energy Conservation Certification for household electric washing machines
Hong Kong, China	IEC 60456; JIS C 9606	None	Mandatory Energy Efficiency Labeling Scheme (MEELS) for Washing Machines (To be effective in 2011)	Voluntary Energy Efficiency Scheme for Washing Machine
Indonesia	SNI IEC 60456-1-2009	MEPS for clothes washers	n/a	None
Malaysia	MS IEC 60335-1:2003 MS IEC 60335-2-4:2003 MS 1597: Part 2-7:2003		None	None

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
	MS 1597:Part 2-43:2005 MS IEC 60335-2-11:2003			
Mexico	NOM-005-ENER-2010	Energy efficiency of household electric washing machines	Energy Efficiency Label	Sello FIDE Label for washing machines
New Zealand	AS/NZS 2040.1:2005	None	Energy Efficiency Labeling for Clothes Washers	NEW ZEALAND ENERGY STAR® program for Washing Machines
Korea	KS C 9608; JIS C 9606	MEPS for Washing machine (Agitator & Impeller)	Energy efficiency labeling for washing machine (Agitator & Impeller)	None
	KS C IEC 60456 & KS C 9608	MEPS for Horizontal drum washing machine	Energy efficiency labeling for horizontal drum washing machine	None
Chinese Taipei	JIS 9606; CNS 2926, US ENERGY STAR	None	None	Energy Conservation Label for Clothes Washers
Thailand	IEC 60456	Under development	None	None
The Philippines		Under development	None	None
The US	10 CFR Part 430 Subpart B App J , 10 CFR Part 430 Subpart B App J1 , AHAM HWL-1 , US ENERGY STAR	10 CFR Part 430: Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards	EnergyGuide - Clothes Washers	ENERGY STAR-Clothes Washers; Energy Star-Commercial Clothes Washer

4.6.2. Clothes Dryer

Standards & Labels

Two APEC economies, Canada and the US, have introduced mandatory standards for clothes dryers and four economies, Australia, Canada, New Zealand and Singapore have mandatory labels. The Philippines is considering developing a mandatory program, while the United States is revising its current standard. Voluntary labels are issued in Hong Kong, China, Chinese Taipei and the United States. In addition, Thailand has been developing both MEPS and HEPS for clothes dryers.

Test Procedures

Hong Kong and Singapore adopt IEC 61121 as their test standard, while others have their own test procedures. Australian Standard AS 2442-1981 incorporates some methods from IEC as well as the US Standard AHAM A197.6. But there are many significant differences between this Standard and those two documents including the different clothes loads used by each, the fact that generally neither the IEC nor the ANSI/AHAM document set minimum performance requirements, the fact that only the IEC standard includes cool-down as part of the test. The table below describes their relationships:

Variable	AS/NZS 2442.1:1996	ANSI HLD 1-1992	IEC 1121:1991
Ambient temperature	20 ±2°C (8)	24 +3°C (1)	20 ±2°C
Humidity	60 ±5%	50 ±10%	65 ±5%
Load	Mixed load	Mixed load	Towels and sheets (2)

Initial moisture	90% ±20g of bone dry	100 ±1% of bone dry	70 ±5% normalized (3)
Final moisture	6% of bone dry	5 ±1% of bone dry	0 ±3% normalized (4)
Scope	All electric tumble	All tumble (5)	Most electric tumble (6)
Clothes temperature	Yes	Yes	No
Wrinkling/creasing test	No	Yes	Under consideration
Lint content exhaust air	No	No	Under consideration
Energy correction	Yes	No	Yes (7)

Product Scope

The mandatory and voluntary standards above define the product scope as electric clothes dryers intended for household or similar use, except that the US standard also includes gas-powered dryers. The overall classifications still have some differences. Hong Kong and Singapore, in particular, indicate that the product should have a rated capacity of up to 10 kg. On the other hand, Canada and the US divide products into standard and compact according to their container size.

Energy Efficiency Level

There two primary ways to measure the energy efficiency of a clothes dryer: the Energy Factor (kg/kwh) [5], as adopted by Canada, Chinese Taipei and the US, and the Average Energy Consumption per cycle (kwh/kg/cycle)[6], as adopted by Hong Kong and Singapore. Canada and the US have almost the same energy level. Singapore assigns a grade to the product according to its energy efficiency performance while Hong Kong sets a voluntary level as shown in the tables below.

Canada

PRODUCT CLASS	**MINIMUM EF 1-May-95**	
	(kg/kWh)	**(lb/kWh)**
Standard clothes dryer (≥ 125-litre capacity)	1.36	3.01
	31-Dec-98	
Compact clothes dryer (< 125-litre capacity)		
120 V	1.42	3.13
240 V	1.31	2.9
Where EF = Energy Factor		

Hong Kong, China

[5] EF(kg/kWh)＝Actual dry weight of test clothes ÷ Power consumption per drying cycle after correction (kWh/cycle)

[6] Defined as the energy consumption per unit of rated drying capacity.

Table 1 Overall Classifications

Type	Function	Category	Description
Air vented	Automatic stoppage	1	Air vented type tumble dryer with automatic stoppage function
	Non-automatic stoppage	2	Air vented type tumble dryer with non-automatic stoppage function
Condenser	Automatic stoppage	3	Condenser type tumble dryer with automatic stoppage function
	Non-automatic stoppage	4	Condenser type tumble dryer with non-automatic stoppage function

Table 2: Average Specific Energy Consumption

Appliance Category	Average Specific Energy Consumption (kWh/kg/cycle)
Category 1 & 2	$E_{av} = 0.81$
Category 3 & 4	$E_{av} = 0.86$

Singapore

Type	Energy Consumption (EC) per wash in kWh				
No. of Ticks	0	1	2	3	4
All clothes dryers	EC > [Rated Capacity[6]]	[Rated Capacity x 0.83] < EC < [Rated Capacity]	[Rated Capacity x 0.67] < EC < [Rated Capacity x 0.83]	[Rated Capacity x 0.50] < EC < [Rated Capacity x 0.67]	EC < [Rated Capacity x 0.50]

Recommendations

Current practices generally diverge between two groups of economies: the Hong Kong-Singapore group and the US-Canada group, in terms of test method, product scope definition, and energy efficiency calculation. As their differences are quite distinct, it will be difficult to make these two groups converge. However, if other APEC members intend to develop a mandatory or voluntary program, they could choose to follow either group's practices, depending according to the region they are more likely to trade with.

Table 16 Clothes Dryers Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 2442.1:1996/Amdt4:2006	None	Energy Labeling for Rotary Clothes Driers	None
Canada	CAN/CSA-C361-92	MEPS for clothes driers	EnerGuide Label	None
Hong Kong, China	IEC 61121	None	None	Voluntary Energy Efficiency Labeling Scheme for Clothes Dryers

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Malaysia	MS IEC 60335-1:2003 MS IEC 60335-2-4:2003 MS 1597: Part 2-7:2003 MS 1597:Part 2-43:2005 MS IEC 60335-2-11:2003		None	None
New Zealand	AS/NZS 2442.1:1996	None	AS/NZS 2442.2:2000 Energy Rating Label for Driers	None
Singapore	IEC 61121:2005		Mandatory Energy Labeling Scheme for Clothes Dryers	None
Chinese Taipei		None	None	Energy Conservation Labeling Program for Clothes Dryers
Thailand	IEC 61121	Underdevelopment	None	None
The Philippines		Under development	None	None
The US	AHAM A197.6	10 CFR Part 430: Energy Conservation Program for Consumer - Clothes Dryers (new standard to be completed by June 2011 and take effect three years later)	None	GS-33 Green Seal's Environmental Standard for Hotel & Lodging Properties

4.7. Water Heaters

4.7.1. Electric Water Heating

Standards & Labels

Eight APEC economies have mandatory standards for electric water heaters and a label is required in China, Korea, Peru and the US. Thailand also has the HEPS for electric water heaters and is currently developing the MEPS. Eight economies have established voluntary labels and four of them – Canada, China, New Zealand and the US – also set specific voluntary criteria for solar-powered heaters. The Philippines and Brunei are considering developing a program for water heaters. In Australia, an agreement has been reached to phase-out electric water heaters in residential homes (www.climatechange.gov.au).

Test Procedures

Almost all member economies have their own test procedures and there is no clear indication of adopting a common international standard. Australia and New Zealand share a common regional standard for the mandatory program, however, New Zealand developed a separate test standard for the voluntary program for solar water heaters. China also has a standard specifically for solar water heaters apart from test methods for normal electric heaters have been issued. The exception is Hong Kong, who did not develop its own test standard, but rather borrowed methods from a European standard (EN), a Chinese standard (GB), and a Japanese standard (JIA).

Product Scope

Two key parameters define the product scope of water heaters: volume capacity in liters and heating power input in kW. Australia and Canada describe their product scopes in terms of volume, Korea and Peru in terms of power consumption, and the US uses a combination of both, with additional details such as temperature and voltage. Peru and the US both recognize electric storage and instantaneous heaters as those with an input of 12kw or less. The description of the range of volume varies from economy to economy. For instance, Australia has three ranges for different types of water heaters (≤63L, 25~630L, 45~710L) while Canada has only one (50~450L).

Energy Efficiency Level

For normal electric heaters, power consumption as a result of standby loss is commonly recognized as a key parameter to measure the product's energy efficiency (EE). Australia requires maximum standing heat loss per day. Hong Kong has an additional parameter for power consumption due to fixed loss. The US adds Energy Factor and First-Hour Rating (gallons per hour). China, however, measures an Inherent 24-Hour Energy Consumption Coefficient as well as the hot water output rate in percentage as a distinct way of assigning grades to products. Due to divergent product scope definitions and energy performance parameters, it is difficult to compare the energy efficiency levels among the economies. For solar heaters, the measurements are quite different. For example, the US ENERGY STAR requires that the heaters' solar fraction (SF) should be no less than 0.5. The Canada ENERGY STAR, on the other hand, requires that the net solar energy contribution be equivalent to ≥ 7.0 GJ/year.

Australia (MEPS)

The 1999 and 2005 MEPS levels for mains pressure (unvented displacement) electric water heaters when tested to AS1056.1 are set out in the table below. AS/NZS 4692.2 set outs MEPS levels when tested to AS/NZS 4692.1.

Maximum Heat Loss for Electric Storage Water Heaters (unvented tanks without an attached feed tank)

Rated Hot Water Delivery (litres)	Maximum Allowable Standing Heat Loss (kilowatt hours/day) October 1999	Maximum Allowable Standing Heat Loss (kilowatt hours/day) October 2005
<25	N/A	0.98
25	1.4	0.98
31.5	1.5	1.05
40	1.6	1.12
50	1.7	1.19
63	1.9	1.33
80	1.47	1.47
100	1.61	1.61
125	1.75	1.75
160	1.96	1.96
200	2.17	2.17
250	2.38	2.38
315	2.66	2.66
400	2.87	2.87
500	3.15	3.15
630	3.43	3.43

Canada (MEPS)

PRODUCT CLASS	MAXIMUM ALLOWABLE STANDBY LOSS Sep-04 (W)
Bottom inlet *	
50 to 270 liters (11 to 59 Imperial gallons)	40 + (0.20V)
> 270 to 454 liters (60 to 100 Imperial gallons)	(0.472V) – 33.5
Top inlet	
50 to 270 liters (11 to 59 Imperial gallons)	35 + (0.20V)
> 270 to 454 liters (60 to 100 Imperial gallons)	(0.472V) – 38.5
Where V = rated storage capacity in liters W = Watts ≤ * = supply pipe external to tank and connection near the bottom. Standby Loss as defined in the CSA test procedure.	

China (Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades)

EE Grade of electrical storage water heater		
Grade	Inherent 24-hour energy consumption coefficient (Ɛ)	Hot water output rate(μ)
1	≤0.6	≥70%
2(HEPS)	≤0.7	≥60%
3	≤0.8	≥55%
4	≤0.9	≥55%
5(MEPS)	≤1.0	≥50%

Hong Kong, China (Voluntary)

Table 2: Average Energy Consumption due to Standing Loss and Fixed Loss

Appliance Category	Average Energy Consumption due to Standing Loss per 24 hours $E_{st,av}$ (kWh/24h)	Average Energy Consumption due to Fixed Loss per 24 hours $E_{st,fix}$ (kWh/24h)
1, 2 (small, unvented or open outlet)	$E_{st,av} = 0.13 + 0.0553\ V^{2/3}$	$E_{st,fix} = 0.072$
3 (horizontal)	$E_{st,av} = 0.75 + 0.008\ V$	$E_{st,fix} = 0.12$
4 (vertical)	$E_{st,av} = 0.2 + 0.051\ V^{2/3}$	$E_{st,fix} = 0.12$

* V is the rated capacity in litres

Recommendation

There is minimal convergence among the APEC group as a whole in terms of the standards, test procedures, product scopes and energy efficiency levels. However, since less than half of APEC economies have a standard or label for electric water heaters, harmonization can begin with those who are planning to develop such programs. Solar water heaters, as a relatively new product, offers an exceptional opportunity for harmonization, but there is a need to first coordinate product definition and energy performance parameters among the several existing voluntary programs.

Table 17 Electric Water Heating Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS/NZS 4692.1:2005	AS/NZS 4692.2:2005 MEPS Requirements for Electric Storage Water Heaters	None	None
Brunei		None	None	Under development
Canada	Mandatory: CAN/CSA-C191-00 Voluntary: CSA F379 / T.I.L. MSE-45	CAN/CSA-C191-00 MEPS for Electric Water Heaters	None	ENERGY STAR for Solar Water Heaters
China	GB 21519-2008	The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Electrical Storage Water Heaters	China Energy Label - Electrical Storage Water Heaters	China Energy Conservation Certification for Electrical Storage Water Heaters

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
	GB/T19141-2003	None	None	China Energy Conservation Certification for Solar water heating system
Hong Kong, China	IEC 60379	None	None	Voluntary Energy Efficiency Labeling Scheme for Electric Storage Water Heaters
Indonesia		under development	None	None
Mexico	NOM-003-ENER	None	None	Sello FIDE Label for electrical water heaters
New Zealand	Mandatory: AS/NZS 4692.1:2005; Voluntary: AS/NZS 2712:2007	AS/NZS 4692.1.2005: MEPS Requirements for Electric Hot Water Cylinders	N/A	NEW ZEALAND ENERGY STAR® program (Criteria for Solar water heating systems Version 1)
Korea		MEPS for Electrical Coolers and Heaters for Drinking-Water Storage	Energy efficiency labeling for Electrical Coolers and Heaters for Drinking-Water Storage	None
Peru	PNTP 370 502 2008	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	None
Chinese Taipei	CNS 11010-89	MEPS for Electric Water Heaters	None	Energy Label Program for Electric Storage Tank Water Heaters
Thailand	TIS 1693	Under development	None	None
The US	10 CFR Part 430 Subpart B App E , ANSI / ASHRAE 118.2-1993 , ASHRAE 41.1-1986 (RA 01) , ASTM-D-2156-94 (1999)	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters	EnergyGuide - Electric Water Heaters	ENERGY STAR Water Heater(Gas Condensing, Heat Pump, Solar, High Efficiency Gas Storage, and Whole Home Gas Tankless)

4.7.2. Gas and/or Oil-Fired Water Heating

Standards & Labels

Seven APEC economies have introduced MEPS for gas water heaters and four of them - Canada, Japan, Mexico and Chinese Taipei - have MEPS for oil-fired water heaters. A mandatory label is required in China, Japan, Korea, Mexico and the US. In addition, seven economies have created voluntary labels for gas water heaters, and four of them – Canada, Japan, Korea and Mexico – also have voluntary labels for oil-fired heaters. Korea has not set mandatory requirements for oil-fired heaters, but does have a voluntary label. Canada and Japan have mandatory and voluntary programs for both gas and oil-fired heaters. In addition, Australia is launching MEPS for gas heaters in early 2011 and considering a mandatory label.

Test Procedures

Almost all member economies have their own test procedures and there is no clear indication of adopting a common international standard. The exception is Hong Kong, China, who did not

develop its own test standard, but rather borrowed methods from a European standard (EN), a Chinese standard (GB), and a Japanese standard (JIA).

Product Scope

Most economies use two key parameters to define the product scope of gas and oil-fired water heaters: heating load, or input rating, in British Thermal Unit (Btu)/hour or kW, and storage capacity in liters. However, the range of heating load or storage capacity varies a lot from economy to economy. For instance, Canada specifies gas-heated water containers to have an input of 21.98 kW (75 000 Btu/hr) or less. For Korea, it is 69.5 kW or less, and for Mexico, it is below 108 kW.

Energy Efficiency Level

Economies use mainly two parameters to assess the products' energy efficiency performance. Canada calculates the Energy Factor. Japan and Mexico measure energy consumption efficiency percentage. The US uses a combination of both, with an additional First-Hour Rating (gallons per hour). Due to divergent product scope definitions and energy performance parameters, it is difficult to compare the energy efficiency levels among the economies. For the ENERGY STAR program, both Canada and the US have almost the same criteria for Energy Factors across all product subcategories, but their criteria for First-Hour Rating are considerably different.

Canada (MEPS)

Oil-fired water heaters

PRODUCT CLASS	**MINIMUM EF** **Sep-04**
≤≤ Input rating 30.5 kW (107 000 kJ/h) and storage capacity 190 litres (50 U.S. gallons)	0.59 – 0.0005V
Where EF = Energy factor calculated as defined in the CSA test procedure. V = rated storage capacity in litres	

Japan (Top Runner)

In the target fiscal year and each subsequent fiscal year, energy consumption efficiency in each category shall be at or greater than the target standard value.

Category				Standard energy consumption efficiency
Purpose	Heating type	Air supply and exhaust type or control method	Category name	
For hot water supply	Instantaneous type		A	86.0
	Storage type with rapid heating system		B	87.0
	Storage types other than rapid heating system		C	85.0
For heaters	Instantaneous type	Unvented type	D	85.3
		Vented type	E	79.4
		Direct vent type	F	82.1
	Storage type with rapid heating system	On/off control	G	87.0
		Other than on/off control	H	82.0
	Storage types other than rapid heating system		I	84.0
For baths	Water heaters with a center flue heat exchanger		J	75.0
	Water heaters without a center flue heat exchanger		K	61.0

Remarks : 1. "For hot water supply" refers to equipment mainly used to supply hot water, including equipment featuring heating or bathing functions.
2. "For heaters" refers to equipment mainly used for heating, including equipment that has hot water supply or bathing functions.
3. "For baths" refers to equipment used mainly for bath use, including equipment that has hot water supply or heating functions.
4. "Rapid heating system" refers to equipment of which heating time (as measured by the heating speed measurement method described in JIS S3031) is within 200 seconds.
5. "Center flue heat exchanger" refers to the air flue that penetrates the hot water supply section.
6. "On/off control" refers to those that control by only ignition and extinction.

Canada (ENERGY STAR)

Product category	**Minimum Efficiency Rating**	**Other Ratings**	**Warranty**	**Efficiency rating test method** (most recent versions)
Gas Storage **(Until 2010/8/31)**	EF ≥ 0.62	First-Hour Rating (FHR) ≥ 254 litres per hour	6 years	CSA P.3
Gas Storage **(As of 2010/9/1)**	EF ≥ 0.67	First-Hour Rating (FHR) ≥ 254 litres per hour	6 years	CSA P.3
Gas Tankless	EF ≥ 0.82	LPM ≥ 9.5 over 42.8°C rise	10 years on heat exchanger and 5 years on parts	CSA P.7
Condensing gas storage	EF ≥ 0.80	First-Hour Rating (FHR) ≥ 254 litres per hour	8 years	CSA P.3
Heat Pump Water Heater	EF ≥ 2.0	First-Hour Rating (FHR) ≥ 190 litres per hour	6 years	CSA C745
Solar Water Heaters	Net solar energy contribution equivalent to ≥ 7.0 GJ/year		10 years for collectors, 6 years for storage tanks, 2 years for controls, and 1 year for piping and parts	CSA F379 / T.I.L. MSE-45

United States (ENERGY STAR)

3) **ENERGY STAR Criteria**: Only those products listed in Section 2 that meet the criteria below may qualify as ENERGY STAR.

ENERGY STAR Criteria	Energy Factor	First-Hour Rating	Warranty	Safety
GAS STORAGE (ENDING 8/31/2010)	EF ≥ 0.62	FHR ≥ 67 gallons per hour	Warranty ≥ 6 years on sealed system	ANSI Z21.10.1/CSA 4.1
GAS STORAGE (BEGINNING 9/1/2010)	EF ≥ 0.67	FHR ≥ 67 gallons per hour	Warranty ≥ 6 years on sealed system	ANSI Z21.10.1/CSA 4.1

ENERGY STAR Criteria	Energy Factor	Gallons-Per-Minute	Warranty	Safety
WHOLE-HOME GAS TANKLESS	EF ≥ 0.82	GPM ≥ 2.5 over a 77°F rise	Warranty ≥ 10 years on heat exchanger and 5 years on parts	ANSI Z21.10.1/CSA 4.1 or ANSI Z21.10.3/CSA 4.3, depending on burner size

ENERGY STAR Criteria	Energy Factor	First-Hour Rating	Warranty	Safety
GAS CONDENSING	EF ≥ 0.8	FHR ≥ 67 gallons per hour	Warranty ≥ 8 years on sealed system	ANSI Z21.10.1/CSA 4.1

ENERGY STAR Criteria	Energy Factor	First-Hour Rating	Warranty	Safety
HEAT PUMP WATER HEATER	EF ≥ 2.0	FHR ≥ 50 gallons per hour	Warranty ≥ 6 years on sealed system	UL 174 and UL 1995

ENERGY STAR Criteria	Solar Fraction	Warranty	Safety
SOLAR WATER HEATER	SF ≥ 0.5	Warranty ≥ 10 years on solar collector, 6 years on storage tank, 2 years on controls and 1 year for piping and parts.	OG-300 Certification from the SRCC.

Recommendation

For gas and oil-fired water heaters, there is minimal convergence among the APEC groups as a whole in terms of the standards, test procedures, product scopes and energy efficiency levels. However, since less than half of APEC economies have a standard or label for these types of water heaters, harmonization can begin with those who are planning to develop such programs. There is a need to first coordinate product definition and energy performance parameters among the several existing programs.

Table 18 Gas and/or Oil-Fired Water Heating Cross-Economy-Product Matrix

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
Australia	AS4552:2005	MEPS for Gas Water Heater due to commence in early 2011.	Mandatory Government label is under consideration.	
Canada	CAN/CSA-B211-00	MEPS for Oil-Fired Water Heaters	None	ENERGY STAR for Domestic Water Heaters
	CSA P.3-04	MEPS for Gas Water Heaters	None	
China	GB 20665-2006; GB 6932	Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers	China Energy Label for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers	China Energy Conservation and Environmental-friendly Certification for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers
Hong Kong, China	EN 26; GB 6932; JIA F 031	N/A	N/A	Voluntary Energy Efficiency Labeling Scheme for Household Domestic Gas Instantaneous Storage

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Voluntary Label
				Water Heaters
Japan	JIS S2109; S2103	Top Runner Program for Gas Water Heater	Label Display Program	Energy Saving Labeling Program
	JIS S3031.	Top Runner Program for Oil-fired Water Heater	Label Display Program	Energy Saving Labeling Program
Korea	KS B 8109; KS C 8127	MEPS for Household Gas Boiler	Energy Efficiency Label for Household Gas Boiler	High-Efficiency Appliance Certification Programs for Domestic gas boilers
		N/A	N/A	High-Efficiency Appliance Certification Programs for Oil burning water boilers
Mexico	NOM-003-ENER-2000	Thermal efficiency of water heaters for domestic and commercial	Energy Efficiency Label	N/A
Chinese Taipei	Mandatory: CNS 2141 Voluntary: CNS 13603	MEPS for steam boilers with oil or gas firing	None	Energy Label Program for Instantaneous Gas Water Heaters
The US	Mandatory: Appendix E to Subpart B of Part 430 Voluntary: Chapter 11, Part 430, Subpart B of Part 430; SRCC-OG-300 rating	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters (electric and gas)	Energy Guide	ENERGY STAR- Water Heater(Gas Condensing, Heat Pump, Solar, High Efficiency Gas Storage, and Whole Home Gas Tankless)
	Subpart G of Part 431	10 CFR Part 431: Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment	Energy Guide	

5. Key Findings and Recommendations

5.1. Key Findings

In the previous sections, the report provided preliminary analysis of divergence and convergence of energy-efficient product standards for the specific product categories: air conditioners; refrigerators & freezers; domestic & commercial lighting; computers & monitors; televisions; clothes washers & dryers; and water heating. In analyzing divergence and convergence of energy efficiency standards and labeling across those product categories, the study identified the following key findings.

Dual approach to address energy efficiency across various product categories. Some APEC economies use mandatory approaches more frequently, while others pursue voluntary approaches for the majority of product categories.

Voluntary energy labels are used but applicability varies. Voluntary labels are used as a market mechanism to promote energy efficiency by 16 APEC economies, but only a few economies cover most of the studied products.

Developed economies have more robust MEPS and labeling programs. The US appears to have the highest numbers of MEPS and labeling programs. With a few exceptions, most of the more-developed economies have more robust MEPS and labeling programs.

Harmonization of energy standards presents many technical obstacles. Complete harmonization of energy standards requires harmonization of test procedures, product scope and definition, key performance characteristics, and energy levels. For most products studied, there is minimum convergence among all these factors, and often energy levels are not comparable because of different product scope or key performance characteristics.

Many economies refer to but do not completely adopt international test standards. For some products, economies refer to the same test standards. For example, ISO 5151 for AC, ENERGY STAR for computers and monitors, and ISO 15502 and IEC 62552 for household refrigerators. However, in most cases, the economies do not directly adopt the referenced international test standards and still develop their own specific test standards with significant variance from the international test standards. Note that this is partly because the ISO standards are not always directly suitable to be made into MEPS standards.

Industry Voluntary Standards are adopted by some economies. For certain products, voluntary industry standards may be more commonly adopted by APEC economies or referenced in economies' standards. These standards could be a potential opportunity to reach some of the objectives of APEC and the Expert Groups.

ENERGY STAR voluntary labels are used by some APEC economies. The US voluntary labeling program, ENERGY STAR, is one of the oldest and most successful voluntary labeling programs covering a large range of residential and commercial appliances. The ENERGY STAR voluntary label has been introduced into six economies. Some of the other APEC economies have their own voluntary labels with different test standards and energy levels

Voluntary labels are used more often than mandatory standards. For some products such as TVs and computers, very few APEC economies have mandatory standards, and voluntary labels and programs are widely used. For example, for one of the most highly traded products, TVs, only three APEC economies have issued mandatory standards, while 11 economies have adopted voluntary labels. Four economies use the ENERGY STAR label.

Few economies' domestic energy policies support energy standard harmonization. Most APEC economies work independently to develop energy standards and labels – only two economies encourage adoption of or harmonizing to existing international test standards and measurement methods.

Australia and New Zealand has a successful harmonization S&L program. A noted exception to lack of harmonization is the successful joint program, the 'Equipment Energy Efficiency (E3) Program' between Australia and New Zealand. The E3 Program covers mandatory Minimum Energy Performance Standards and Energy Rating Labels. These are open market agreements that facilitate trade in goods between the two economies. These practices provide the successful demonstration of mutual recognition of energy efficiency standards.

5.2. Key Recommendations

As the study revealed, energy efficiency standards and programs among APEC economies vary widely and are often difficult to compare due to differences in test standards, product scope, and definition of energy levels. There may be a number of obstacles to alignment or harmonization of standards, labeling, testing and measurement procedures, due to differences in domestic energy policies, level of economic development, specific product development, concerns about harming innovation, and funding availability and capacity in S&L program development. This section presents some recommendations which the ICF International finds useful for APEC to study as possible measures to reduce NTBs of energy efficient products in the region. The recommendation takes into consideration other factors including APEC members' comments, APEC organization, national policies, management and implementation of S&L programs. The recommendations below incorporate conclusions of the 8Th Standards and Conformance Conference for Green Harmonization.

Administrative and Policy Recommendations

Leading Role for APEC. APEC can play an important role world-wide in energy-efficient technology development and implementation due to its focus on trade and the diversity of developed and developing member economies. It is much more efficient and cost-effective for a regional organization such as APEC to work for alignment and harmonization of energy efficiency standards and programs based on collective efforts than for each economy to work individually.

EGEE&C collaborate with other APEC foras on priority projects. Currently APEC has set up various foras with various objectives. The APEC SCSC and EGEE&C should make it a priority to work together to strengthen energy standard and labeling harmonization efforts, including conducting future joint meetings and projects. For example, this report's findings align well with the APEC Energy Minister's instruction to establish a Collaborative Assessment of Standards and Testing – CAST initiative.

APEC collaborate with key international organizations (such as IEA, IEC, and ISO) to jointly develop projects to strengthening S&L harmonization. Although many APEC economies commit to adopting IEC test standards, the standards are most often adapted to fit the economies' own conditions. APEC could represent its economies and actively participate in IEA and ISO's development or updating of test standards. A good example is the Lighting Information and Technical Exchange for Standards (LITES) Asia project to facilitate greater involvement by APEC economies in the development of IEC standards for lighting, specifically for CFLs, Mercury, and LEDs. This effort resulted in standards more appropriate for regional needs, thus enabling APEC economies to adopt IEC specifications with minimum local variations. LITES Asia also helped members to become involved in the IEC process and get regular updates regarding the latest developments in IEC lighting projects and standards. A new initiative is the Clean Energy Ministerial

which has launched a range projects addressing priorities such as Super Efficient Appliance Deployment (SEAD) and International Partnership on Energy Efficiency Cooperation (IPEEC).

Share information to ensure transparency of energy efficiency standards and labeling. APEC can utilize the APEC- ESIS website to post and map S&L programs among APEC economies. In reviewing the ESIS website, the study found that information for many APEC economies is incomplete or outdated. APEC economies need to more actively share information and updates of their S&L programs. This task can be done more effectively and accurately by each APEC economy. We recommend APEC economies provide an annual update of their S&L information on the APEC-ESIS website.

APEC economies utilize APEC ESIS website for S&L program information. The ESIS website has in-depth information on S&L programs of APEC economies, thus is a great S&L program information resource for APEC economies. EGEE&C will be reviewing information updates and recommendations on improving functionalities of the website which will strengthen user-friendliness and analysis functions of the website. Presently, it includes the following information/functionality:

- up-to-date information about appliance and equipment energy standards and regulations;
- links to experts and information related to standards and regulations being used by APEC and other economies;
- a regular newsletter with a listing of new and proposed standards in the region (APEC Standards Notification Procedure);
- "Communities of Practice" for experts and officials to discuss efforts to harmonies and rationalize the testing, labeling, and minimum energy standards for specific appliances and equipment.

APEC develops and shares best practices of S&L program. APEC can use the APEC-ESIS vehicle to share best practices, including how to successfully measure and evaluate the impacts of S&L programs and profiles of successful bi-lateral or regional harmonization initiatives.

APEC involves relevant stakeholders. Harmonization of S&L is a long-term process, technically, administratively, and policy wise. A successful program will require participation of APEC experts, industry stakeholders, international experts, policy makers and experts from APEC economies. .

Focus on capacity building and training. One of the study's key findings is that the developed economies have more robust MEPS and labeling programs. However, some of the developing economies have no or very minimum S&L programs. To enable trade of energy goods and services, promoting development of more energy efficient products, and harmonization of S&L among APEC economies, it is important to build S&L capacity in these economies. For example, it may be worth considering expanding the US ENERGY STAR voluntary label, which has already been adapted directly by several APEC economies, to other economies.

Encourage APEC economies to adopt existing international test methods and standards. This study finds that there are no energy efficiency standards and labels in some economies for some of the products studied. APEC can take a leadership role in encouraging the APEC economies which do not have the standard and labels for particular products to evaluate the existing international test standards, energy efficiency standards and programs and to adopt the existing ones with appropriate national deviations.

Encourage APEC economies to develop policy commitments to aligning its energy efficiency standards and labels with international standards. Useful examples to follow include Australia and Japan. In the Australian standards and labeling program, policy allows any product consuming energy to be considered for inclusion in mandatory or voluntary measures based on equivalent efficiency standards in a major trading partner economy.

Encourage APEC economies to coordinate domestic energy efficiency and standards and conformance policies. For each APEC economy, policy coordination is important between divisions in charge of energy efficiency policy and standard setting.

Technical Recommendations

Mutual Recognition and/or harmonization of energy efficiency standards and labeling are feasible, but require vast policy and technical commitments. Listed below are recommended first steps toward S&L harmonization.

Test standards harmonization is an important and necessary first step. Harmonization of test standards is an important and necessary first step, and the easiest to harmonize. Harmonization of testing standards provides the market with a unified way to compare energy performance, which will make harmonization of standards much easier and more effective. There are many international test standards such as IES and ISO, which are widely adopted by some APEC economies. Once a test standard is identified, it is important to work with test standard developers to jointly develop or update the standard, as discussed in the previous section.

Harmonize conformity assessment mechanisms. Together with test standard harmonization, conformity assessment harmonization will reduce trade barriers because products would go through a more streamlined market entry process. It is important that the test data will have common metrics and is in a single test report that can be reviewed and benchmarked against various programs to make compliance decisions and apply labels in accordance with the economy's specific needs.

5.3. Other Ideas (for reference)

As stated in previous section, the most important step toward harmonization is test standards harmonization. This section includes ICF International's additional thoughts on harmonization of energy efficiency standards and labels. All of the ideas are ambitious and difficult to achieve which will take significant policy and resource commitments.

Development of "APEC Benchmarking Metrics." Because it is difficult among economies to mutually recognize or completely harmonize the energy efficiency levels, as an intermediate option, APEC could consider developing "APEC Benchmarking Metrics" for selected products with graded energy levels. The purpose of the APEC Benchmarking Metric is to act as a common metric and clear comparable scheme for energy efficiency levels among economies. It is not meant to replace existing labeling programs of the APEC economies. However, economies with no existing S&L program for selected products could choose to adopt the APEC Benchmarking Metric.

As mentioned in the previous section, the most important first step is for economies to harmonize its test standards, which is also the pre-requisite for a comparable common metric. Without harmonized test standards, economies will not be able to compare its energy levels among each other.

Each economy can match the energy levels in their MEPS and/or voluntary label to the appropriate energy grade on the APEC Benchmarking Metric, and encourage use of the APEC metric in accordance with each economy's specific needs. For those products which have the harmonized test standards but the energy efficiency levels vary in economies, this APEC Benchmarking Metric can provide users with clear and comparable information. Although it is an intermediate way among the final steps of standard harmonization, this still is very challenging work, and will create additional work because it need solid foundation of test standard harmonization and development of the

benchmarking metric. APEC could build on some of the preliminary work completed by the Efficient Electrical End-use Equipment's (4E) Mapping and Benchmarking Annex.

Mutual Recognition of Energy Efficiency Standards. One option for reducing trade barriers for products is for APEC economies to "mutually recognize" each others' energy efficiency standards. This option is also very challenging and need more work and resources, but could be accepted by some APEC economies. There are successful examples of recognition and adoption of the ENERGY STAR voluntary label in five APEC economies. This would be especially challenging to do for mandatory energy standards, given the differences in policy, scope, definition, and test standards.

Harmonization of energy efficiency standards. This is the most complicated but possibly the most effective option. Since some economies have successfully harmonized energy standards for external power supplies in 2004, and Australia and New Zealand have a successful joint program, APEC can use these efforts as a case studies to support harmonization. Note that for the external power supplies harmonization program, although it was only three economy's efforts, it took a large international team of policy makers and technical experts to successfully develop and implement this effort. Implementation of this option will take a committed team of APEC program managers, and policy and technical experts from member economies and other international organizations. Capacity and/or funding for participating developing economies may also be needed.

Below are preliminary thoughts on harmonization process. The study recommends a more in-depth analysis to develop a more comprehensive roadmap for harmonization.

Initial Harmonization of Voluntary Energy Efficiency Standards. Voluntary standards and labels have proven to be an effective market transformation tool to encourage development of more efficient products (e.g., ENERGY STAR), and the ENERGY STAR voluntary label has been successful adopted by some APEC economies. Mandatory standards and labels are useful regulatory tools, but are more difficult to harmonize because each economy has unique national policies and is generally less flexible to changing national standards as part of harmonization efforts. Thus, initially, harmonization efforts should focus on voluntary standards, which allow for flexibility and compromise.

Begin with a Subset of "Voluntary" APEC Economies. Although it is important that all APEC economies understand the process, the first demo project could begin with a set of "voluntary" economies.

Identify a demo product in accordance to a set of criteria, such as:

- A highly traded product.
- A "simple product." The definition of a simple product includes a matured technology with a clear product definition, clear product category, or a comparable straight-forward energy level.
- A product with a wide wattage range. Although this may not directly influence the energy level, a different wattage range may create other technical issues such as safety.
- A product that will help reduce GHGs.
- A product for which most economies do not have existing standards or labels.

From the products studied, based on the preliminary set of criteria above, one of the following products could be good candidates for harmonization:

Solid State Lighting (SSL). SSL is a good candidate because it is a new, rapidly developing, highly energy-efficient lighting product, and most economies do not have standards and labels for this product. Currently, there are no mandatory standards among APEC economies, and only Malaysia, Korea, and the US have launched voluntary labeling programs. US and China are

collaborating on harmonizing the energy efficiency levels, beginning with harmonizing of test methods. Presently, various international organizations, economies, industry associations, and testing labs are working on different standards. APEC can also actively facilitate harmonization activities among member economies and collaborate with other international organizations. Since SSL is at the early stage of technology development, harmonization should be less complicated.

Test Standards. As first step, it is important to harmonize the test standards. SSL is very new and typically combines with other technologies, e.g. electronics and controllers. This indicates that more work and effort is needed to develop the SSL test standards. IEC has published serious standards, and the US has also issued several standards for testing, e.g. IESNA LM-79-08 Electrical and Photometric Measurement of Solid State Lighting Products and IESNA LM-80-08, Approved Method for Measuring Lumen Maintenance of LED Light Sources. However based on the information we obtained from the APEC economies, there is not any convergence in terms of test standards.

Level of Energy Efficiency. SSL has various product (lamp) types and energy performance varies among lamp types. Presently, the above-mentioned APEC economies covers different individual lamp types, including LED lamps, LED traffic lights, LED internal & external converters, SSL luminaires and integral LED lamps. The current standards can serve as a reference for those that are considering developing relevant SSL standards.

Computers. There is existing convergence in computer standards among the APEC economies, which presents a unique opportunity for APEC to facilitate further harmonization. Computer is highly traded product and comparable in term of straight-forward energy levels. A few APEC economies have already adopted the ENERGY STAR test methods and the ENERGY STAR as their voluntary energy label. Since most economies currently have programs for computers using the ENERGY STAR test methods, as a first step, it is recommended that other (especially new program) member economies adopt the ENERGY STAR test methods.

CFL. CFL is a good candidate because is an efficient and widely used traded product. However, CFL may be more difficult to harmonize because many APEC economies have established standards and label programs for CFLs, and CFLs have various product definitions and performance characteristics. As a first step, it is possible to harmonize the test standards, as five APEC economies already adopted or referenced IEC standard *IEC 60969 Self-ballasted lamps for general lighting services - Performance requirements* in their S&L scheme. This offers a common approach for economies currently developing or considering developing standards. Level of Energy Efficiency will be more difficult to harmonize because of various performance characteristics and product scopes and definitions.

Identify and agree on test standards. This is an important first step, and may be the easiest to harmonize. Harmonization of testing standards provides the market with a unified way to compare energy performance, which will make harmonization of standards much easier and more effective. There are many international test standards such as IES and ISO, which are widely adopted by some APEC economies. Once a test standard is identified, it is important to work with test standard developers to jointly develop or update the standard, as discussed in the previous section.

Jointly test and analyze products among the voluntary APEC economies. It is important that the voluntary APEC economies test products in their home economies, and the team jointly analyzes test data obtained to ensure technical factors are agreeable in each economy.

Identify and agree on other technical factors. These factors include product scope, key performance characters (e.g., COP, EER), and energy level. To be fully harmonized, all these technical factors must be consistent among all economies.

Table 19 Summary of Mandatory Standard

Product	Australia	Brunei Darussalam	Canada	Chile	China	Hong Kong, China	Indonesia	Japan	Malaysia	Mexico	New Zealand	Papua New Guinea	Peru	Korea	Russia	Singapore	Chinese Taipei	Thailand	The Philippines	The United States	Vietnam
Air Conditioners – Room	M		M	M	M		M	M		M	M			M			M	M	M	M	
Air Conditioners – Central	M		M		M			M		M	M						M			M	
Refrigerators/Freezers - Household	M		M		M		M	M		M	M		M	M	U	M	M	M	M	M	
Commercial Refrigeration	M		M				M	U		M	M			M			M	U		M	
Compact Fluorescent Lamps	M		M		M			M		M			M				M	V	M	M	
Fluorescent Lamps	M		M		M			M			M		M	M			M	V	M	M	
Incandescent Lamps	M		M											M			M		M	M	
HID Lamps					M															M	
Solid State Lighting																					
Ceiling Fan Lighting Kits			M																	M	
Integrated Lamps																					
Lighting Systems for Public Areas										M											
Torchieres			M																	M	
Light Fixtures																					
Lighting Sensor equipment																					
Reflectors																					
Ballasts	M		M		M				M		M			M			M				
Computers	U				U		U	M										U	U		
Monitors	U			M			U														
Televisions	M		M		M		U	M							U			U	U		
Clothes Washers			M		M		M			M				M				U	U	M	
Clothes Dryer			M															U	U	M	
Water Heaters - Electric	M		M		M		U	U			M		M	M			M	U		M	
Water Heaters - Gas	U		M		M			M		M				M			M				M
Water Heaters - Oil-Fired			M					M		M							M				

Legend: **M** – Mandatory Standard **V** – Voluntary Standard **U** – Under development **T** – To be further researched

Table 20 Summary of Labeling Programs

Product	Australia		Brunei Darussalam		Canada		Chile		China		Hong Kong, China		Indonesia		Japan		Malaysia		Mexico		New Zealand		Papua New Guinea		Peru		Korea		Russia		Singapore		Chinese Taipei		Thailand		The Philippines		The United States		
Type of Label	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Voluntary	
Air Conditioners - Room	M				M	V	M		M	V	M	V		V	M	V		V	M	V	M	V					M	V			M		M	V	M		M	V	
Air Conditioners - Central	M	V				V			M	V					M	V			M	V	M	V															M	V	
rators/Freezers - Household	M			U	M	V	M		M	V	M	V		V	M	V		V	M	V	M	V			M		M		U	V	M		M		M	V	M		M	V	
Commercial Refrigeration						V									U				M	V							M										M	V	
Compact Fluorescent Lamps						V	M		M	V	M	V			M	V				V		V			M			V				U	V		V	M	V	M	V	
Fluorescent Lamps					M	V	M			V					M	V		V		V					M		M	V				U	V		V	M	V	M		
Incandescent Lamps					M		M																				M										M		
HID Lamps									M	V										V								V								M		M		
Solid State Lighting																		V		V								V									M	V	
Ceiling Fan Lighting Kits						V																															M	V	
Integrated Lamps						V		V												V												V					M	V	
ng Systems for Public Areas																				V																			
Torchieres						V																																V	
Light Fixtures																				V																M		V	
Lighting Sensor equipment																				V								V											
Reflectors																												V									M		
Ballasts						V				V		V						V		V							M	V						V	M	V			
Computers		V				V				V		V			M	V			M			V					M	V										V	
Monitors	U	V							M	V		V				V				V		V					M	V				V		V				V	
Televisions	M				U	V			M	V		V		V	M	V		V	M	V		V					M	V				V		V			M	V	
Clothes Washers	M				M	V			M	V	M	V							M	V	M	V					M					V					M	V	
Clothes Dryer	M				M							V									M									M			V						
Water Heaters - Electric				U		V			M	V		V			U					V		V			M		M						V				M	V	
Water Heaters - Gas	U				M	V			M	V		V			M	V											M	V						V			M	V	
Water Heaters - Oil-Fired					M	V									M	V												V										

Legend: **M** – Mandatory Label **V** – Voluntary Label **U** – Under development **T** – To be further researched

Acronyms

AC – air conditioner
AEER – Annual Energy Efficiency Ratio
AHAM - Association of Home Appliance Manufacturers (US)
AHRI – Air-Conditioning, Heating and Refrigeration Institute (US)
ANS – American National Standards
ANSI – American National Standards Institute
APEC – Asia-Pacific Economic Cooperation
APP – Asia-Pacific Partnership
AQSIQ – General Administration of Quality Supervision, Inspection & Quarantine (China)
AS – Standards Australia
ASHP – air-source heat pumps
ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM – American Society for Testing and Materials
BEF – ballast efficacy factor
BR – bulbous reflector
BRESL – Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labeling Project
BTU – British Thermal Unit
CCT – correlated color temperature
CEA – Consumer Electronics Association (US)
CEN – European Commission for Standardization
CFLs – compact fluorescent lamps
CFR – Code of Federal Regulations (US)
CIE – International Commission on Illumination
CLASP – Collaborative Labeling and Appliance Standards Program
CNS – Chinese National Standard (Chinese Taipei)
COP – coefficient of performance
CQC – China Quality Certification Center
CPU – central processing unit
CRI – color rendering index
CRT – cathode ray tube
CSA – Canadian Standards Association
CTI – Committee on Trade and Investment
DAM – Download Acquisition Mode
DOE – Department of Energy (United States)
DVI – Digital Visual Interface
E3 – Equipment Energy Efficiency
EE – energy efficiency
EEI – energy efficiency index
EER – energy efficiency ratio
EF – energy factor
EGAT – Electricity Generating Authority of Thailand
EGEE&C – Expert Group on Energy Efficiency and Conservation
EGS – environmental goods and services
ELI – Efficient Lighting Initiative
EN – European Standard
EPA – Environmental Protection Agency (US)
EPACT – Energy Policy Act (US)
EPS – external power supply
EPTS - energy performance testing standards
ER – ellipsoidal reflector
ERL – Energy Rating Labels (Australia)
ESIS – Energy Efficiency Standards Information System (APEC)
EWG – Energy Working Group
FL – fluorescent lamp
FTC - Federal Trade Commission (United States)
GB – GuoBiao (China National Standards)
GEF – Global Environmental Facility
GOST – gosudarstvennyy standart (Russian state standard)

GS – Green Seal
HEPS – high energy performance standard
HID – high intensity discharge
HRF – Human Resource Framework (Australia)
HSPF – heating seasonal performance factor
IEC – International Electrotechnical Commission
IEA – International Energy Agency
IEEE – Institute of Electrical and Electronic Engineers
IES – Illuminating Engineering Society
IESNA – Illuminating Engineering Society of North America
IP – Internet Protocol
IPEEC – International Partnership for Energy Efficiency Cooperation
IPLV – Integrated Part Load Value
IPS – internal power supply
ISO – International Organization for Standardization
JB – mechanical standard (China)
JIA – Japan Gas Appliances Inspection Association
JIS – Japanese Industrial Standards
KEMCO – Korea Energy Management Corporation
Kg – kilogram
KS – Standards Korea
kW – kilowatt
kWh – kilowatt-hour
LCD – liquid crystal display
LED – light emitting diode
LITES – Lighting Information and Technical Exchange for Standards
LFCA - compact fluorescent lamps
MAG – Market Access Group
MEF – modified energy factor
MEPS – minimum energy performance standard
MEELS –Mandatory Energy Efficiency Labeling Scheme (Hong Kong, China)
METI – Ministry of Economy, Trade and Industry (Japan)
MKE – Ministry of Knowledge Economy (Korea)
MS – Malaysian Standards
MTOP – Mobile Transport over Packet
NSF – National Sanitation Foundation (US)
NTB – non-tariff barrier
NTP - Norma Técnica Peruana (Peruvian Technical Standard)
NZS – Standards New Zealand
OCAP – Open Cable Applications Platform
PAR – parabolic aluminized reflector
PC – personal computer
PDP – plasma display panel
PNS – Philippines National Standards
PTAC/HP – packaged terminal air conditioners and heat pumps
RAC – room air conditioner
SAC – Standardization Administration of China
SCSC – Sub-Committee on Standards and Conformance
SEAD – Super-efficient Equipment and Appliance Deployment
SEER – Seasonal Energy Efficiency Ratio
SGLS – Singapore Green Labeling Scheme
SNI - Standard National Indonesia
SOM – Senior Officials Meeting
SRCC – Solar Rating and Certification Corporation
S&L – standards and labeling
TCVN – Vietnam National Standards
TEC – total energy consumption
TILF - Trade and Investment Liberalization and Facilitation
TIS – Thailand Industrial Standards
UL – Underwriters Laboratory

UNDP – United Nations Development Program
USB – Universal Serial Bus
VESA – Video Electronics Standards Association
VEEPL – Vietnam Energy Efficient Public Lighting
VGA – video graphics array
VRF – virtual routing and forwarding

References

APEC. *A Strategic Vision for International Cooperation on Energy efficiency standards and Labeling: A Monograph with Commentary by International Experts*. Australian Greenhouse Office, June, 2006.

APEC. *Summary of Workshop on Environmental Goods and Services (EGS)*. 33rd Market Access Group Meeting, Singapore, 29 July 2009.

CLASP. *Case Study: Regional S&L Collaboration*. Available at www.clasponline.org.

EGEE&C. *APEC Project Proposal*: Reducing Trade Barriers for Environmental Goods & Services in APEC region (Mapping Exercise of Energy Efficient Products). 2005.

EGEE&C. *Request for Proposal*: Reducing Trade Barriers for Environmental Goods & Services in APEC region (Mapping Exercise of Energy Efficient Products). 2010.

Fridley, David. *Comparison of Test Procedures and Energy Efficiency Criteria in Selected International Standards and Labeling Programs for Clothes Washers, Water Dispensers, Vending Machines and CFLs*. Lawrence Berkeley National Laboratory. July 16, 2010. Available at http://escholarship.org/uc/item/86r27114

Harrington, Lloyd & Damnics, Melissa. *Energy Labelling and Standards Programs throughout the World, Edition 2*. The National Appliance and Equipment Energy Efficiency Committee, Australia, July 2004.

Jassen, Rod. *Harmonizing Energy Efficiency Requirements – Building Foundations for Co-operative Action*. International Center for Trade and Sustainable Development. Issue Paper No. 14. September 2010.

METI. *Top Runner Program: Developing the World's Best Energy Efficient Appliances*, Revised Edition. March, 2010.

Saheb, Yamina. *S&L Harmonization: Benefits, Barriers & Opportunities*. Presented at Computer & Server Energy Efficiency Standards/Labeling Workshop, on November 4th, 2009, in Beijing. Available at www.clasponline.org.

Sinsukprasert, Prasert. *Mandatory versus Voluntary Approaches to Appliance Standards and Labelling*.

Collins Terry. *Contribution to Furthering the APEC EGS Work Programme*. Presented at The 8th Conference on Standards and Conformance for Green Harmonization, on September 18, 2010, in Sendai, Japan.

Collins, Terry. *Facilitation of Business Environment: Establishment of a Common Platform to Moderate Existing Obstacles*. Presented at Workshop on Environmental Goods and Services, Singapore, 29 July 2009.

Economy EE Standards & Labels Website:

Australia: www.energyrating.gov.au
Brunei: www.energy.gov.br:81
Canada: www.oee.nrcan.gc.ca
Chile: www.sec.cl
China: www.aqsiq.gov.cn
www.cecp.org.cn
www.sac.gov.cn
www.china-cas.org
www.cnis.gov.cn
www.cqc.com.cn

Hong Kong,China: www.emsd.gov.hk
Indonesia: www.djlpe.esdm.go.id
Korea: www.ats.go.kr
www.kemco.or.kr
www.koeco.or.kr
Japan: www.eccj.or.jp
New Zealand: www.eeca.govt.nz
Malaysia: www.st.gov.my
Mexico: www.conae.gob.mx/wb/CONAE/CONA_1002_nom_publicadas_vigen
fide.codice.com/home/subhome.asp?seccion=3
Peru: siee.minem.gob.pe
Philippines: www.bps.dti.gov.ph
Russia: www.gost.ru
Singapore: app.nea.gov.sg
Chinese Taipei: www.energylabel.org.tw
Thailand: www2.egat.co.th/labelNo5
United States: www1.eere.energy.gov

www.energystar.org
Vietnam: www.veepl.vast.ac.vn

Appendix A: APEC Economies' Product Energy Efficiency Standards & Labeling Summary

Australia

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	AS/NZS 3823.2:2009 - Performance of electrical appliances – Air conditioners and heat pumps - Energy Labeling and minimum energy performance standard requirements	New MEPS requirements come into force in 1 April, 2010	Energy Labeling for Single Phase Non-ducted Air Conditioners for Household Use	From 1987, updated in 2000 and 1 April 2010	AS/NZS3823.1.1: 1998 as amended, AS/NZS3823.1.2: 2001 as amended, or AS/NZS3823.3:2005.	Energy Labeling for three phase and ducted air conditioners	From 1987, updated in 2000 and 1 April 2010	AS/NZS3823.1.1: 1998 as amended, AS/NZS3823.1.2: 2001 as amended, or AS/NZS3823.3:2005.	Further changes will be introduced in April 2011. More stringent MEPS levels will be introduced in October 2011.
	AS/NZS 4965.2-2008: Performance of close control air conditioners - Minimum energy performance standard requirements	1-Jul-09	N/A		AS/NZS 4965.1-2008	N/A			
	AS/NZS 4776.2-2008: Liquid-chilling packages using the vapor compression cycle - Minimum energy performance standard and compliance requirements	1-Jul-09	N/A		AS/NZS 4776 1.1-2008; AS/NZS 4776 1.2-2008	N/A			
Refrigerator & freezer	AS/NZS4474.2-2009: Performance of household electrical appliances-Refrigerating appliances - Energy Labeling and minimum energy performance standard requirements	New requirements come into force on 1 April 2010	Energy Labeling for Household Refrigerators and Freezers	From 1 October 1999, revision 1 January 2005, new requirements on 1 April 2010	AS/NZS 4474.1:2007/Amdt 1:2008	N/A			Amendments to the standards are will be made during 2011.

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	AS 1731.14-2003: Refrigerated display cabinets - Minimum energy performance standard requirements	1-Oct-04	N/A		AS 1731.(1-13)-2003	N/A			
Lighting	AS/NZS 4782.2:2004: Double-capped fluorescent lamps - Performance specifications - Minimum Energy Performance Standard	1-Oct-04	N/A		AS/NZS 4782.1:2004; AS/NZS 4782.3 (Int):2006	N/A			
	AS/NZS 4847.2-2010: Self-ballasted lamps for general lighting services - Minimum energy performance standard requirements	1-Nov-09	N/A		AS/NZS 4847.1-2010	N/A			
	AS/NZS 4934.2-2008 (Int): Incandescent lamps for general lighting services - Minimum energy performance standard requirements	1-Nov-09	N/A		AS/NZS 4934.1 (Int) -2008	N/A			
	AS/NZS 4783.2:2002 : Performance of electrical lighting equipment - Ballasts for fluorescent lamps - Energy Labeling and minimum energy performance standard requirements	1-Mar-03	N/A		AS/NZS 4783.1: 2001	N/A			
Computers & Monitors	N/A		N/A			ENERGY STAR for Computers		US ENERGY STAR requirements	Standards for computers and standards and labels for monitors are currently under consideration.

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Televisions	AS/NZS 62087.2.2:-2010: Power consumption of audio, video and related equipment - Minimum energy performance standards and energy rating label requirements for television sets	1-Oct-09	Energy Labeling for Televisions	1-Oct-09	AS/NZS 62087.1:2010				
Clothes washers	N/A		Energy Labeling for Clothes Washers		AS/NZS 2040.1:2005/Amdt 1:2007	N/A			
Clothes driers	N/A		Energy Labeling for Clothes Dryers		AS/NZS 2442.1:1996/Amdt 4:2006	N/A			
Water heating	AS/NZS 4692.2: 2005 -- Minimum energy performance standard Requirements for Electric Storage Water Heaters	1-Oct-05	N/A		AS/NZS 4692.1: 2005	N/A			
	Standards and Labels for Gas Water Heaters								Standard for Gas Water Heaters is expected to commence in early 2011.

Canada

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	MEPS for Room Air Conditioners	EnerGuide	1-Jan-03	CAN/CSA-C368.1-M90	ENERGY STAR for Room Air Conditioners		CAN/CSA-C368.1-M90	Increase the MEPS by about 10% to the ENERGY STAR requirements for most window and TTW equipment. Effective on January 1, 2011.
	MEPS for Single-Phase and Three-Phase Single-Package Central Air Conditioners and Heat Pumps	N/A	February 3, 1995, for single-phase units; December 31, 1998, for three-phase units	CAN/CSA-C656-05	ENERGY STAR for Residential Air-Source Heat Pumps (ASHPs) and Central Air Conditioners		CAN/CSA-C656-05	
	MEPS for Single-Phase and Three-Phase Split-System Central Air Conditioners and Heat Pumps	N/A	February 3, 1995, for single-phase units; December 31, 1999, for three-phase units	CAN/CSA-C656-05			CAN/CSA-C656-05	
	MEPS for Packaged Terminal Air Conditioners and Heat Pumps	N/A	31-Dec-98	CAN/CSA-C744-04	N/A			
Refrigerator & freezer	MEPS for Household Refrigerators, Refrigerator-Freezers and Wine Chillers	EnerGuide	3-Feb-95	CAN/CSA C300-08	ENERGY STAR for Refrigerators, Refrigerator-Freezers and Freezers	31-Dec-05	Refrigerator: 10 CFR 430, Subpart B, Appendix A1 Freezer: 10 CFR 430, Subpart B, Appendix B1	Updated MEPS for residential wine chillers. Effective on January 1, 2008.

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	MEPS for Household Freezer	EnerGuide	(February 3, 1995) July 1, 2001 and December 31, 2005 (Type 10A)	CAN/CSA C300-09				
	MEPS for Self-Contained Commercial Refrigerator & Freezer	N/A	1-Apr-07	ASHRAE 117-1992 ASHRAE 72-1998	ENERGY STAR for Commercial Refrigerators and Freezers	1-Jan-10	AHRI 1200-2008	
Lighting	MEPS for CFLs	EnerGuide			ENERGY STAR for CFLs		US EPA Test Methods	-
	MEPS for Fluorescent Lamp Ballasts	N/A	3-Feb-95	CAN/CSA-C654-M91(amended 2001)	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps	1-Aug-08	US EPA Test Methods	As of April 1, 2010, all ballasts must meet the same minimum energy performance requirements.
	MEPS for General Service Fluorescent Lamps	EnerGuide	1-Feb-96	CAN/CSA-C819-95 (2001)				
	MEPS for General Service Incandescent Reflector Lamps, ER and BR Lamps	EnerGuide	September 1, 2008 for lamp package Labeling. Incandescent reflector lamps regulated since December 31, 1996. BR and ER lamps regulated since January 1, 2003.	CAN/CSA-C862-01 (ANSI C78.21 Table 1 of Part II for lamp class)				-

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	MEPS for General Service Lamps	EnerGuide	September 1, 2008 for lamp package Labeling. January 1, 2012 and December 31, 2012 for minimum performance	IESNA LM45 for lamp lumen output and wattage; IESNA LM49 for lamp life; CIE 13.3 for lamp Color Rendering Index (CRI)				-
	MEPS for Torchieres	N/A	January 1, 2007 and January 1, 2010	CSA C22.2 No. 12				
	MEPS for Ceiling Fan Lighting	N/A	1-Jan-10	CSA C22.2 No. 9				
Computers	N/A	N/A			ENERGY STAR for Computers	1-Jul-09	US EPA Test Methods	
Monitors	N/A	N/A			ENERGY STAR for Monitors	Tier 1: October 30, 2009 & January 30, 2010 Tier 2: October 30, 2011	US EPA Test Methods	
Televisions	MEPS for Standby Power Consumption	Under development	Tier 1: 1 July 2010 Tier 2: 1 Jan 2013	CAN/CSA-C62301-07	ENERGY STAR for Televisions	1-May-10	CAN/CSA-C62301-07 IEC 62301, Draft, Ed. 2.0	
Clothes washers	MEPS for Clothes Washers (and household-style commercial)	EnerGuide	1-Jan-07	CAN/CSA-C360-03	ENERGY STAR for Clothes Washers		CAN/CSA-C360-03	
Clothes driers		EnerGuide	May 1, 1995, for standard clothes dryers. December 31, 1998, for compact clothes dryers	CAN/CSA-C361-92	N/A			
Water heating	MEPS for Oil-Fired Water Heaters	N/A	3-Feb-95	CAN/CSA-B211-00	ENERGY STAR for Domestic Water Heaters	1-Jan-09	CAN/CSA-B211-00	
	MEPS for Gas Water Heaters	N/A	3-Feb-95	CSA P.3-04			CSA P.3-04	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	MEPS for Electric Water Heaters	N/A	3-Feb-95	CAN/CSA-C191-00			CAN/CSA-C191-00	

Chile

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	N/A	Energy Efficiency - Air Conditioners - Classification and Labeling	1-Dec-09	NCh3081.Of2007 ISO 5151 (1994)	N/A			
	N/A	Energy Efficiency - Refrigerators, Freezers, Refrigerator-Freezers - Classification and Labeling	2-Oct-06	NCh3000.Of3006 ISO 15502 (2005)	N/A			
Refrigerator & freezer	N/A	Energy Efficiency - CFL for General lighting - Classification and Labeling	23-Dec-08	NCh3020.Of2006 IEC 60969 (2001)	N/A			
Lighting	N/A	Energy Efficiency - Incandescent Tungsten Filament - Classification and Labeling	2-Jun-06	NCh3010.Of2006 IEC 60064 (2005)	N/A			
		Energy Efficiency - Double-capped fluorescent - Classification and Labeling	14-Jul-08	NCh3020.Of2006 IEC 60081 (2002)	N/A			
		Energy Efficiency – Single-capped only fluorescent - Classification and Labeling	14-Jul-08	NCh3020.Of2006 IEC 60901 (2001)	N/A			
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			N/A			
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	N/A			N/A			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Water heating	N/A	N/A			N/A			

China

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	GB 19576-2004 - The minimum allowable values of the energy efficiency and energy efficiency grade for unitary air conditioners	1-Mar-05	China Energy Label for unitary air conditioners	1-Mar-07	GB 19576-2004; GB/T 17758; GB/T 18836; JB/T 8072	China Energy Conservation Certification for unitary air conditioners		GB 19576-2004; GB/T 17758; GB/T 18836; JB/T 8072	
	N/A		N/A			China Energy Conservation Certification for unitary air conditioners for computer and data processing room	13-Mar-10	CQC3126-2010; GB/T 19413-2003	
	GB 12021.3-2010 - The minimum allowable values of the energy efficiency and energy efficiency grade for room air conditioners	1-Jun-10	China Energy Label for room air conditioners	1-Mar-05	GB 12021.3-2010; GB/T 7725-2004	China Energy Conservation Certification for room air conditioners		GB 12021.3-2010; GB/T 7725-2004	
	GB 21455-2008 The minimum allowable values of the energy efficiency and energy efficiency grades for variable speed room air conditioner	1-Sep-09	China Energy Label for variable speed room air conditioners	1-Mar-09	GB 21455-2008; GB/T 7725	China Energy Conservation Certification for variable room air conditioners		GB 21455-2008; GB/T 7725	
	GB 21454-2008 The minimum allowable values of the IPLV and energy efficiency grades for multi-connected air-condition (heat pump) unit	1-Sep-08	China Energy Label for multi-connected air-condition (heat pump) unit	1-Mar-09	GB21454-2008; GB/T 18837	China Energy Conservation Certification for multi-connected air-condition (heat pump) unit		GB21454-2008; GB/T 18837	
	GB 19577-2004 - The minimum	1-Mar-05	China Energy	1-Jun-08	GB 19577-	China Energy		GB 19577-	

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	allowable values of the energy efficiency and energy efficiency grades for water chillers		Label for water chillers		2004; GB/T 18430; GB/T 10870	Conservation Certification for multi-connected air-condition (heat pump) unit		2004; GB/T 18430; GB/T 10870	
	N/A		N/A			China Energy Conservation Certification for Lithium Bromide Absorption Water Chiller	25-Sep-09	CQC 3106-2009; GB/T18431-2001; GB/T 18362-2008	
	N/A		N/A			China Energy Conservation Certification for hermetic motor-compressor for room air conditioners	25-Sep-09	CQC 2209-2009; GB/T15765-2006; GB/T 18429-2001; GB/T 10079-2001; GB/T 19410-2008;	
	N/A		N/A			China Energy Conservation Certification for water source heat pumps	21-Apr-10	CQC3123-2010; GB/T19409-2003	
Refrigerator & freezer	GB 12021.2-2008: The minimum allowable values of the energy efficiency and energy efficiency grade for household refrigerators	1-May-09	China Energy Label for household refrigerators	3-Mar-05	GB 12021.2-2008; GB/T 8059	China Energy Conservation Certification for household refrigerators		GB 12021.2-2008; GB/T 8059	
Lighting	GB17896-1999 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for tubular fluorescent lamps ballast	1-Jun-00	N/A		GB17896-1999; GB/T15144-1994	China Energy Conservation Certification for tubular fluorescent lamps ballast		GB17896-1999; GB/T15144-1994	Revision supposed to be finished in 2010
	GB19043-2003 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for double-capped	1-Sep-03	N/A		GB19043-2003; GB/T10682	China Energy Conservation Certification for double-capped fluorescent		GB19043-2003; GB/T10682	Revision supposed to be finished in 2010

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	fluorescent lamps for general lighting service					lamps for general lighting service			
	GB19044-2003 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for self-ballasted fluorescent lamps for general lighting service	1-Sep-03	China Energy Label for self-ballasted fluorescent lamps for general lighting service	1-Jun-08	GB19044-2003; GB/T17263	China Energy Conservation Certification for self-ballasted fluorescent lamps for general lighting service		GB19044-2003; GB/T17263	Revision supposed to be finished in 2010
	GB 19415-2003 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for single-capped fluorescent lamps	1-Jun-04	N/A		GB 19415-2003; GB/T 17262	China Energy Conservation Certification for single-capped fluorescent lamps		GB 19415-2003; GB/T 17262	Revision supposed to be finished in 2010
	GB 19573-2004 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for high-pressure sodium vapor lamps	1-Feb-05	China Energy Label for high-pressure sodium vapor lamps	1-Jun-08	GB 19573-2004; GB/T 13434	China Energy Conservation Certification for high-pressure sodium vapor lamps		GB 19573-2004; GB/T 13434	
	GB 19574-2004 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for ballast for high-pressure sodium lamp	1-Feb-05	N/A		GB 19574-2004; IEC60925; GB/T 13434	China Energy Conservation Certification for ballast for high-pressure sodium lamp		GB 19574-2004; IEC60925; GB/T 13434	
	GB 20054-2006 - The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for metal- halide lamps	1-Jul-06	N/A		GB 20054-2006	China Energy Conservation Certification for metal-halide lamps		GB 20054-2006	
	GB 20053-2006 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for ballast of metal-	1-Jul-06	N/A		GB 20053-2006	China Energy Conservation Certification for ballast for metal- halide lamps		GB 20053-2006	

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	halide lamps								
	N/A		N/A			China Energy Conservation Certification for Luminaires system for road lighting	15-Mar-10	CQC3105-2009	
Computers & Monitors	N/A		N/A			China Energy Conservation Certification for computers	25-Sep-09	CQC3114-2009	
	GB 21520-2008: The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Computer Monitors	1-Nov-08	China Energy Label for computer monitors	1-Mar-09	GB 21520-2008	China Energy Conservation Certification for computer monitors	25-Sep-09	GB 21520-2008	
Televisions	GB 12021.7-2005 - Limited values of energy efficiency and evaluating values of energy conservation for color television broadcasting receivers	1-Mar-06	N/A		GB 12021.7-2005; GB/T 17309.1	China Energy Conservation Certification for color television broadcasting receivers	25-Feb-08	GB 12021.7-2005; GB/T 17309.1	
	GB 24850-2010 The minimum allowable values of the energy efficiency and Energy efficiency grade for Flat Panel Televisions	30-Jun-10	N/A		GB 24850-2010	China Energy Conservation Certification for Flat Panel Televisions	25-Sep-09	CQC3113-2009	
Clothes washers	GB 12021.4-2004: The minimum allowable values of the energy efficiency and Energy efficiency grade for household electric washing machines	1-May-05	China Energy Label for household electric washing machines	1-Mar-07	GB 12021.4-2004	China Energy Conservation Certification for household electric washing machines		GB 12021.4-2004	

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Clothes driers	N/A		N/A			N/A			
Water heating	GB 20665-2006: The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers	1-Jul-07	China Energy Label for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers	1-Jun-08	GB 20665-2006; GB 6932	China Energy Conservation and Environmental-friendly Certification for Domestic gas instantaneous water heater and gas fired heating-hot water combi-boilers		GB 20665-2006; GB 6932	
	GB 21519-2008: The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Electrical Storage Water Heaters	1-Nov-08	China Energy Label for Electrical Storage Water Heaters	1-Mar-09	GB 21519-2008	China Energy Conservation Certification for Electrical Storage Water Heaters		GB 21519-2008	
	N/A		N/A			China Energy Conservation Certification for Solar water heating system		GB/T19141-2003	
	N/A		N/A			China Energy Conservation Certification for Air-source heat pump water heater of commercial &industrial and similar application	25-Sep-09	CQC2210-2009	

Hong Kong, China

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	N/A	Mandatory Energy Efficiency Labeling Scheme for Room Air	9-Nov-09	ISO5151	Voluntary Energy Efficiency Labeling Scheme for Room Coolers	15-Jun-96	ISO 5151	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
		Conditioners						
Refrigerator & freezer	N/A	Mandatory Energy Efficiency Labeling Scheme for Refrigerating Appliances	9-Nov-09	ISO5155; ISO7371; ISO 8187; ISO8561; ISO15502; IEC62552	Voluntary Energy Efficiency Labeling Scheme for Household Refrigeration Appliances	15-Jun-95	ISO5155; ISO7371; ISO 8187; ISO8561; ISO15502; IEC62552	
Lighting	N/A	Mandatory Energy Efficiency Labeling Scheme for Compact Fluorescent Lamps	9-Nov-09	IEC 60969, CIE 84	Voluntary Energy Efficiency Labeling Scheme for Non-integrated Type Compact Fluorescent Lamps	29-Dec-98	IEC60969; IEC 60901; CIE 84	
	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for Electronic Ballasts	23-Dec-04	EN 50294	
Computers	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for Computers	23-Dec-04	Sleep Mode	
Monitors	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for LCD Monitors	22-Dec-03	On Mode/Active Power; Sleep Mode; Off Mode	
Televisions	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for Televisions	22-Dec-03	Standby Mode	
Clothes washers	N/A	Mandatory Energy Efficiency Labeling Scheme for Washing Machines	Commenced on 19 March 2010 with an 18-month grace period	IEC 60456, JIS C 9606	Voluntary Energy Efficiency Labeling Scheme for Washing Machines	15-Dec-97	IEC 60456; JIS C 9606	
Clothes driers	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for Electric Clothes Dryers	28-Dec-99	IEC 61121	
Water heating	N/A	N/A			Voluntary Energy Efficiency Labeling Scheme for Household Electric Storage Water Heaters	28-Dec-00	IEC 60379	
	N/A	N/A			Voluntary Energy Efficiency	23-Dec-04	EN 26; GB 6932;	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
					Labeling Scheme for Household Domestic Gas Instantaneous Storage Water Heaters		JIA F 031	

Indonesia

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	MEPS for Room AC - split type	N/A		ISO 5151	Voluntary label for ACs	Under development	ISO 5151:1994; JIS C 9612	
	MEPS for Room AC - window type	N/A		ISO 5151	N/A			
Refrigerator & freezer	MEPS for household refrigerators	N/A		SNI IEC 15502-2009	Voluntary label for refrigerators		SNI 04-6710-2002; SNI 04-6711-2002; SNI 04-6958-2003	
Lighting	MEPS for ballast (magnetic)	N/A		SNI IEC 60929-2009	N/A			
	MEPS for fluorescent lamps	N/A		SNI IEC 60901-2009	N/A			
	MEPS for incandescent lamps	N/A		SNI IEC 60432-1-2009	N/A			
	N/A	N/A			Voluntary label for CFLs	2008	IEC 60969	
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			Voluntary label for televisions		JIS C 6101-1; IEC 60107-1	
Clothes washers	MEPS for clothes washers	N/A		SNI IEC 60456-1-2009	N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	N/A	N/A			N/A			

Japan

	Mandatory Standard	Mandatory Label	Effective Date of the Standard	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	Top Runner Program for RAC(packaged terminal)	Label Display Program	June 2009; Label Display Program Implemented since Oct 2006	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	Energy Saving Labeling Program	Aug 2000	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	
	Top Runner Program for RAC(split)			JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	Energy Saving Labeling Program	Aug 2000	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS C 9612	
	Top Runner Program for Central AC (Split type)			JIS B 8616; JIS C 9612	Energy Saving Labeling Program	Aug 2000	JIS B 8616; JIS C 9612	
	Top Runner Program for Ducted AC and heat pumps			JIS B 8615-2; ISO 13253	Energy Saving Labeling Program	Aug 2000	JIS B 8615-2; ISO 13253	
	Top Runner Program for Non-ducted AC and heat pumps			JIS B 8615-1; ISO 5151	Energy Saving Labeling Program	Aug 2000	JIS B 8615-1; ISO 5151	
Refrigerator & freezer	Top Runner Program for Refrigerators-Freezers	Label Display Program	Sep 2006, Label Display Program Implemented since Oct 2006	JIS C 9801(1999); JIS C 9801(2006)	Energy Saving Labeling Program	Aug 2000	JIS C 9801(1999); JIS C 9801(2006)	
Lighting	Top Runner Program for Fluorescent Lamps and Compact fluorescent lamp	Label Display Program	Jul 2009, Label Display Program Implemented since March 2010	JIS C 7601	Energy Saving Labeling Program	Aug 2000	JIS C 7601; JIS C 8105-3	
Computers & Monitors	Top Runner Program for Computer	Label Display Program	Dec 2009, Label Display Program Implemented since March 2010	Public notice	ENERGY STAR for Monitor; ENERGY STAR for Computer; Energy Saving Labeling Program for Computer	Aug 2000	For Computer :IPS: Generalized Internal Power Supply Efficiency Test Protocol Rev. 6.4.2; EPS: ENERGY STAR Test Method for External Power Supplies; ENERGY STAR Computer Test Method (Version 5.0),III, IV, V; For Monitor: VESA, ISO/IEC 17025.Energ Star Test P	

	Mandatory Standard	Mandatory Label	Effective Date of the Standard	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Televisions	Top Runner Program for Televisions	Label Display Program	Jul 2009, Label Display Program Implemented since March 2010	JIS C 7501	Energy Saving Labeling Program	Aug 2000	JIS C 7501	
Clothes washers	Not included in Top Runner Program			JIS C 9606			JIS C 9606	
Clothes driers	Not included in Top Runner Program			JIS C 9608			JIS C 9608	
Water Heater	Top Runner Program for Gas Water Heater	Label Display Program	May 2004, Label Display Program Implemented since March 2006	JIS S2109; S2103	Energy Saving Labeling Program	Aug 2000	JIS S2109; S2103	
	Top Runner Program for Oil-fired Water Heater	Label Display Program	May 2004, Label Display Program Implemented since March 2006	JIS S3031.			JIS S3031.	

Korea

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	MEPS for Air-conditioner	Energy Efficiency Label for Air-conditioner	1-Jan-04	KS C 9306	High-Efficiency Appliance Certification Programs for Multi-air conditioner			
	MEPS for Electric Driven Heat Pump	Energy Efficiency Label for Electric Driven Heat Pump	1-Jan-09	KS C 9306	N/A			
Refrigerator & freezer	MEPS for Refrigerator	Energy Efficiency Label for Refrigerator	30-Apr-08	KS C ISO 15502	N/A			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	MEPS for Commercial Refrigerator	Energy Efficiency Label for Commercial Refrigerator	1-Jan-10	KS C ISO 15502	N/A			
	MEPS for Freezer	Energy Efficiency Label for Freezer	1-Jan-10	KS C ISO 15502	N/A			
	MEPS for Kimchi Refrigerator	Energy Efficiency Label for Kimchi Refrigerator	31-Dec-08	KS C ISO 9321	N/A			
Lighting	MEPS for Incandescent Lamp	Energy Efficiency Label for Incandescent Lamp	1-Jan-09	KS C 7501	N/A			
	MEPS for Fluorescent Lamp	Energy Efficiency Label for Fluorescent Lamp	1-Jan-10	KS C 7601	High-Efficiency Appliance Certification Programs for Fluorescent Lamps (including 26mm 32W fluorescent lamps, Compact fluorescent lamps, FPL 32W compact fluorescent lamps, T-5 fluorescent lamps)			
	MEPS for Fluorescent Lamps Ballast	Energy Efficiency Label for Fluorescent Lamps Ballast	1-Jan-09	KS C 8102	High-Efficiency Appliance Certification Programs for Ballasts (including Ballasts for 26mm 32W fluorescent lamps, Ballasts for 16mm fluorescent lamps, Ballasts for FPL 32W compact fluorescent lamps, Electronic ballasts for metal halide lamps, Electronic ballasts for natrium lamps)			
	MEPS for Associated Ballast	Energy Efficiency Label for Associated Ballast	1-Oct-04	KS C 7621				
	N/A	N/A			High-Efficiency Appliance Certification Programs for LED Lamps (internal & external converter)			
	N/A	N/A			High-Efficiency Appliance Certification Programs for LED Traffic Lights			
	N/A	N/A			High-Efficiency Appliance Certification Programs for Metal-halide Lamps			
	N/A	N/A			High-Efficiency Appliance Certification Programs for Reflectors for fluorescent			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
					lamps and HID lamps			
	N/A	N/A			High-Efficiency Appliance Certification Programs for Sensor lighting equipment			
Computers & Monitors	N/A	E-Standby Power Program for Computers (Warning Label)	1-Jul-09	KS C IEC 62301	E-Standby Power Program for Computers (High Standby Power Reduction Potentials)		KS C IEC 62301	
	N/A	E-Standby Power Program for Monitors (Warning Label)	1-Jul-09	KS C IEC 62301	E-Standby Power Program for Monitors (High Standby Power Reduction Potentials)		KS C IEC 62301	
Televisions	N/A	E-Standby Power Program for Televisions (Warning Label)	28-Aug-08	KS C IEC 62301	E-Standby Power Program for Televisions (High Standby Power Reduction Potentials)		KS C IEC 62301	
Clothes washers	MEPS for Washing Machine (Agitator & Impeller)	Energy Efficiency Label for Washing Machine (Agitator & Impeller)	1-Jan-07	Partly adopt KS C 9608	N/A			
	MEPS for Horizontal Drum Washing Machine	Energy Efficiency Label for Horizontal Drum Washing Machine	1-Jan-09	Partly adopt KS C IEC 60456 & KS C 9608	N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	MEPS for Household Gas Boiler	Energy Efficiency Label for Household Gas Boiler	1-Jan-03		High-Efficiency Appliance Certification Programs for Domestic gas boilers			
	N/A	N/A			High-Efficiency Appliance Certification Programs for Oil burning water boilers			

Malaysia

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	N/A	N/A			Energy efficiency rating and labeling for AC	2006	MS ISO 5151:2004	
Refrigerator & freezer	N/A	N/A			Energy efficiency rating and labeling for refrigerators	2005	ISO 8561 : 2000	
Lighting	MS 1778: PART 2:2005 Electrical lighting equipment - Ballasts for fluorescent lamps - Part 2: Energy Labeling and minimum energy performance standard requirements	N/A	10-Jan-05	MS 1778: Part 1:2005	Energy efficiency rating and labeling for ballasts for fluorescent lamps	2006	MS 141: Part 2 :1993 & MS IEC 929 :1995	
	N/A	N/A			Energy efficiency rating and labeling for electric lamps (fluorescent and LED lamps)	2006	MS IEC 60969:2006	
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			Energy efficiency rating and labeling for ballasts for televisions	2006	IEC 62087 Edition 2.0: 2008-10 for on mode power and MS IEC 62301:2006 for standby mode power	
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	N/A	N/A			N/A			

Mexico

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Revision Plan

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Revision Plan
AC	Energy efficiency and user safety requirements for room air conditioners	Energy Efficiency Label	2009-2-1	NOM-021-ENER/SCFI-2008	Sello FIDE	Draft Mexican Official Standard PROY-NOM-023-ENER-2008: Energy efficiency in split type, free flow, ductless air conditioners. Publication Date: 13 May 2010
	Energy efficiency in central air conditioning, package or split	Energy Efficiency Label	2007-8-21	NOM-011-ENER-2006	Sello FIDE	
Refrigerator & freezer	Energy efficiency of refrigerators and freezers appliances	Energy Efficiency Label	2003-5-13	NOM-015-ENER-2002	Sello FIDE	
	Energy efficiency and user safety requirements for self-contained commercial refrigeration	Energy Efficiency Label	2009-3-13	NOM-022-ENER/SCFI-2008	Sello FIDE	
Lighting	Energy efficiency and security requirements of compact fluorescent lamps	N/A	2008-12-26	NOM-017-ENER/SCFI-2008; NMX-J-295-ANCE	Sello FIDE for CFLs; self-ballasted CFLs	
	N/A	N/A		NMX-J-295-ANCE; NMX-J-513; NMX-J-198-ANCE	Sello FIDE for CFL, T5, T8, HID ballasts	
	N/A	N/A	2007-7-9	NMX-J-295-ANCE; IES-LM 66	Sello FIDE for fluorescent lamps, T5 and T8	
	N/A	N/A	2009-6-9	NMX-J-530-ANCE; IES LM-51	Sello FIDE for HID Lamps	
	N/A	N/A	2008-11-1	NMX-J-198-ANCE; IES LM-31	Sello FIDE for LED fixtures for roads and pedestrian areas, LED fixtures for street lighting powered by PV systems	
	Energy efficiency for lighting systems in non-residential buildings	N/A	2005-8-13	NOM-007-ENER-2004	Sello FIDE for indoor luminaires, outdoor lighting fixtures, induction lamps, HID lamp dimmers, occupancy sensors, industrial use lighting	
	Energy efficiency for lighting systems in public roadways and outdoor areas	N/A	2005-8-17	NOM-013-ENER-2004		
Computers & Monitors	N/A		2007-8-30	NMX-I-163-NYCE	Sello FIDE for computer monitors	Mandatory label for computers is under development.
Televisions	N/A		2009-10-27	NMX-I-122-NYCE; IEC 62087	Sello FIDE for TV receivers	Mandatory label for TVs is under development

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Revision Plan
Clothes washers	Energy efficiency of household electric washing machines	Energy Efficiency Label	2010-6-3	NOM-005-ENER-2010	Sello FIDE	
Clothes driers	N/A					
Water heating	Thermal efficiency of water heaters for domestic and commercial	Energy Efficiency Label	2001-3-1	NOM-003-ENER-2000	Sello FIDE for electrical water heaters	

New Zealand

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	AS/NZS 3823.2:2005 - Performance of electrical appliances - Air conditioners and heat pumps - Energy Labeling and minimum energy performance standard	Energy Labeling for Single Phase Non-ducted Air Conditioners	1-Apr-02	AS/NZS3823.1.1:1998 as amended, AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2002.	Energy Labeling for Three-phase Air Conditioners and Ducted Single-phase Units		AS/NZS3823.1.1:1998 as amended, AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2005.	Revision of minimum energy performance standards (MEPS) and Labeling requirements (AS/NZS 3823.2:2009) is under consideration.
					NEW ZEALAND ENERGY STAR® program (Criteria for Single Phase Air Conditioners and Heat Pumps Version 2)	Version 2 effective from 1 April 2010	AS/NZS 3823.1.1:1998	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Refrigerator & freezer	AS/NZS 4474.2:2001: Performance of household electrical appliances—Refrigerating appliances—Energy Labeling and minimum energy performance standard requirements	Energy Labeling for Domestic Fridges and Freezers	1-Apr-02	AS/NZS 4474.1:2007	N/A			Revised refrigerator standards (AS/NZS 4474.2: 2009) are expected to be phased in.
	AS 1731.14:2003: Refrigerated display cabinets—Minimum energy performance standard (MEPS)	N/A	1-Apr-02	AS 1731 Parts 1 to 13:2003	N/A			
Lighting	AS/NZS 4782.2:2004: Double-capped fluorescent lamps—Performance specifications—Minimum Energy Performance Standard (MEPS)	N/A	1-Apr-02	AS/NZS 4782.1:2004	N/A			
	N/A	N/A			NEW ZEALAND ENERGY STAR® program (Criteria for Compact Fluorescent Lamps)	30-Jun-09		
	AS/NZS 4783.2:2002: Performance of electrical lighting equipment—Ballasts for fluorescent lamps—Energy Labeling and minimum energy performance standards requirements	N/A	1-Feb-03	AS/NZS 4783.1:2001	N/A			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Computers & Monitors	N/A	N/A			ENERGY STAR® program requirements for Computers Version 5.0		US ENERGY STAR test methodology	
	N/A	N/A			ENERGY STAR® program requirements for Displays Version 5.0		US ENERGY STAR test methodology	
Televisions	N/A	N/A			ENERGY STAR® program requirements for Televisions Versions 4.1 and 5.1		US ENERGY STAR test methodology	
Clothes washers	N/A	AS/NZS 2040.2:2005: Performance of household electrical appliances—Clothes washing machines—Energy efficiency Labeling requirements	1-Apr-02	AS/NZS 2040.1:2005	NEW ZEALAND ENERGY STAR® program for Washing Machines (Criteria for Washing Machines)	1-Apr-07	AS/NZS 2040:2005	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Clothes dryers	N/A	AS/NZS 2442.2:2000: Performance of household electrical appliances—Rotary clothes dryers—Energy Labeling requirements	1-Apr-02	AS/NZS 2442.1:1996	N/A			
Water heating	AS/NZS 4692.2:2005: Electric water heaters—Minimum Energy Performance Standard (MEPS) requirements and energy Labeling	N/A	1-Feb-03	AS/NZS 4692.1:2005; older Standards NZS 4602:1988 and NZS 4606:1989 can be used for alternative test methods.	N/A			
	N/A	N/A			NEW ZEALAND ENERGY STAR® program (Criteria for Solar water heating systems Version 1)	Version 1 effective from 1 June 2010	AS/NZS 2712:2007	

Peru

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Revision Plan
AC	N/A	N/A			N/A	
Refrigerator & freezer	Peruvian Technical Standard NTP 399 483 2007 Energy Efficiency for refrigerators, refrigerators-freezers and freezers for domestic use	Energy Efficiency Label		NTP 399 483 2007	N/A	
Lighting	Peruvian Technical Standard NTP 370101-2 2008 Energy	Energy Efficiency Label		NTP 370101-2 2008	N/A	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Revision Plan
	Efficiency for circular, linear, and compact fluorescent and similar lamps for household use					
Computers & Monitors	N/A	N/A			N/A	
Televisions	N/A	N/A			N/A	
Clothes washers	N/A	N/A			N/A	
Clothes driers	N/A	N/A			N/A	
Water Heating	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	Energy Efficiency Label		NTP 370.502 2008	N/A	Energy efficiency standard and label proposed for gas water heaters. Draft PNTP Peruvian Technical Standard 370 502 2009 Energy Efficiency for electric water heaters with storage tank for domestic purposes.

Russia

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	N/A	N/A			N/A			
Refrigerator & freezer	N/A	N/A			Voluntary Labeling for cooling appliances	2001	GOST R 51565-2000 (Energy conservation. Household electrical refrigeration appliances. Efficient of energy consumption. Determination methods); GOST 30204-1995 (Household electrical refrigerating appliances. Performance and test methods)	
Lighting	N/A	N/A			N/A			
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			N/A			
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	N/A	N/A			N/A			

Singapore

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	MEPS for household air-conditioners will be implemented in 2011.	Mandatory Energy Labeling Scheme for Household Air-conditioners	1-Jan-08	ISO 5151: 1994; JIS C 9612: 1994	N/A			
Refrigerator & Freezer	MEPS for household refrigerators will be implemented in 2011.	Mandatory Energy Labeling Scheme for Household Refrigerators	1-Jan-08	IEC 62552: 2007; ISO 15502: 2005	N/A			
Lighting	N/A	N/A			N/A			
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			N/A			
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	Mandatory Energy Labeling Scheme for Clothes Dryers	1-Apr-09	IEC 61121: 2005 with amendment 1	N/A			
Water heating	N/A				N/A			

Chinese Taipei

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	MEPS for Room Air Conditioners (Non-duct)	The update standard promulgated in 2006 and effect in 2011 and 2016	Energy Efficiency Rating and Labeling for Room Air Conditioners	1-Jul-10	CNS 3615; CNS 14464	Energy Label Program for Non-ducted Air Conditioners	Revision promulgated and in effect August 10, 2009	CNS 3615; CNS 14464	
	MEPS for Room Air Conditioners (Split)	1-Jan-02	N/A		CNS 3615, CNS 14464,CNS 7183	N/A			

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	MEPS for Room Air Conditioners Packaged Terminal	1-Jan-02	N/A		CNS 3615, CNS 14464,CNS 7183	N/A			
	MEPS for Water Chiller	1-Jan-03	N/A		CNS 12575, CNS 12812	N/A			
Refrigerator & freezer	MEPS for Refrigerators	Promulgated in 1/6/2006 and effect in 2011	Energy Efficiency Rating and Labeling for Refrigerator/Freezer Products	1-Jul-10	CNS 2062	Energy Label Program for Fan Type Integrated Refrigerator-Freezers	Revision promulgated April 24, 2007 and in effect August 10, 2009	CNS 2062	
Lighting	MEPS for Self-ballasted Fluorescent Lamps	Promulgated in 1/19/2007 and effect in 1/1/2010	Scheduled		CNS 14125	Energy Label Program for Fluorescent Lamps	Revision promulgated and in effect October 24, 2005	CNS 691, CNS 10839, CIE 13.3	
	N/A		Scheduled			Energy Label Program for Fluorescent Lamps with Embedded Ballasts	Revision promulgated and in effect August 3, 2009	CNS 14125	
	MEPS for Compact Fluorescent Lamps	Promulgated in 1/19/2007 and effect in 1/1/2010	Scheduled		CNS14567	Energy Label Program for Compact Fluorescent Lamps	Promulgated November 30, 2009 and in effect July 1, 2010	CNS 14576	
	MEPS for Fluorescent Lamp Ballasts	Promulgated in 2006 and effect in 3/1/2009	N/A		CNS13755	N/A			
	MEPS for Incandescent Lamps		N/A		CNS 3891, CNS 11006, CNS5513	N/A			
	N/A		N/A			Energy Label Program for Exit Lights and Emergency Direction Lights	Promulgated and in effect November 16, 2007		

	Mandatory Standard	Effective Date	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	N/A		N/A			Energy Label Program for Indoor Light Fixtures	Promulgated and in effect November 17, 2008		
Computers & Monitors	N/A		N/A			Energy Label Program for Monitors	Revision promulgated and in effect January 1, 2010	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	
Televisions	N/A		N/A			Energy Label Program for Televisions	Revision promulgated November 30, 2009 and in effect January 1, 2010	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	
Clothes washers	N/A		N/A			Energy Label Program for Clothes Washers	Revision promulgated and in effect April 13, 2010	JIS 9606	
Clothes driers	N/A		N/A			Energy Label Program for Clothes Dryers	Promulgated and in effect October 8, 2002		
Water heating	MEPS for steam boilers with oil or gas firing	1-Jul-03	N/A		CNS 2141	Energy Label Program for Instantaneous Gas Water Heaters	Promulgated and in effect February 24, 2006	CNS 13603	
	MEPS for electric storage water heaters	1989	N/A			Energy Label Program for Electric Storage Tank Water Heaters	Promulgated and in effect January 1, 2008		
	N/A		N/A			Energy Label Program for Electrical Hot Water Pots	Promulgated and in effect September 21, 2007		

Thailand

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	TIS 2134-2545 (2002) Room Air Conditioners Environment Requirements Energy Efficiency – RACs Window/Split	Mandatory Certification Mark	11-Mar-05	TIS 1155-2536 (2002) , TIS 385-2524 (1990);	Energy Efficiency Label			Under revision
Refrigerator & freezer	TIS 2186-2547 (2004) Household Refrigerator: Environment Requirements; Energy Efficiency	Mandatory Certification Mark	23-Dec-06	TIS 2186-2547 (2004); IEC 62552	Energy Efficiency Label (Criteria for one- and two-door models)	23-Dec-06	TIS 455-2537 ISO 7371 JIS C 9607	Under revision
Lighting	Voluntary Standard: TIS 2310-2549 (2006) Self-Ballasted Lamps for General Lighting Services: Energy Efficiency Requirements	None	Aug-94	TIS 2233, IEC 60969	Energy Efficiency Label			
	Voluntary Standard: TIS 2334-2550 (2007) Single-capped fluorescent lamps: energy efficiency requirements	None		TIS 1713	None			
	Voluntary Standard: TIS 2309-2549 (2006) Double-Capped Fluorescent Lamps: Energy Efficiency Requirements	None		TIS 236	Energy Efficiency Label			
	None	None			Energy Efficient Ballast Program - Electronic Ballasts for T5	1-Apr-09	TIS 885-2532, TIS 1506-2542; TIS 1506-2541; IEC 60929 for	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
							Electronic Ballast T5	
	None	None			Energy Efficient Ballast Program - Magnetic Ballasts For Fluorescent Lamps	1998	TIS23-2521	
Computers & Monitors	Standby power MEPS for computers under development	None		IEC 62301	Standby power HEPS for computers under development; Energy Efficiency Label (pilot)			
Televisions	Under development	None		IEC 62301	Standby power program for TVs			
Clothes washers	Under development	None		IEC 60456	None			
Clothes driers	Under development	None		IEC 61121	None			
Water heating	Under development	None		TIS 1693	None			

The Philippines

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	PNS 396-1:1998 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 1: Non-ducted air conditioners		1999	PNS240:1998/ISO 5151:1994	N/A			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
Refrigerator & freezer	PNS 396-2:1997 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 2: Refrigerators and freezers		1999	PNS1474:1997/ISO 5155:1995; PNS1475:1997/ISO 7371 :1995; PNS 1476:1996/ISO 8187:1991;PNS 1477:1996/ISO 8561:1995	N/A			
Lighting	PNS 2050-1-1:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 1-1: Double-capped fluorescent lamps		1-Jan-10	PNS IEC 60081:2006	Efficient Lighting Initiative Program - Double-capped fluorescent lamps	1-Aug-06	IEC 60091	
	N/A	PNS 2050-1-2:2006 Lamps and related equipment - Energy labeling requirements - part 1-2: Single-capped fluorescent lamps	1-Jan-10	PNS IEC 60921:2001 Amd.01,02&03:2006	N/A			
	PNS 2050-2:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 2: Self-ballasted lamps for general lighting services		1-Jan-10	PNS 969:2006	Efficient Lighting Initiative Program - CFLs	1-Mar-06	IEC 60969	
	N/A	PNS 2050-3:2007 Lamps and related equipment - Energy efficiency and labeling requirements - Part 3: High intensity discharge (HID) lamps	Not implemented	PNS IEC 61167:2006; PNS IEC 60188:2006; PNS IEC 60192:2006; PNS IEC 60357:2006; PNS IEC 60662:2006; PNS IEC 62035:2006;	N/A			

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	N/A	PNS 2050-4:2007 Lamps and related equipment - Energy labeling requirements - part 4: Ballast	1-Jan-10	PNS IEC 60929:2006; PNS IEC 60921:2006	Efficient Lighting Initiative Program - Ballast for double-capped fluorescent lamps	1-Feb-07	IEC 60929; IEC 60921	
	N/A	PNS 2050-5:2007 - Lamps and related equipment - Energy labeling requirements - Part 5: Luminaires	Not implemented	PNS IEC 60598-1:2006;				
	PNS 2050-6:2010 - Lamps and related equipment - Energy labeling requirements - Part 6: Incandescent lamps for domestic and similar general lighting purposes	N/A	Not implemented		N/A			
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			N/A			
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	N/A	N/A			N/A			

The United States

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	10 CFR Part 430 Energy Conservation Program for Consumer Products; Conservation Standards for Room Air Conditioners;	October 1, 2000.	EnergyGuide	CFR 430 Subpart B, Appendix F: ANS Z234.1–1972: ASHRAE Standard 16–69	ENERGY STAR	November 16, 2005	10 CFR Part 430 Subpart B App F: ANS Z234.1–1972: ASHRAE Standard 16–69	The revised version to by updated by DOE in 2011; Potential effective in 2014
	10 CFR Part 430 Energy Conservation Program for Consumer Products: Central Air Conditioners and Heat Pumps Energy Conservation Standards;	February 21, 2001.	EnergyGuide	CFR 430 Subpart B, Appendix M: AHRI Standard 210/240–2006; ASHRAE Standard 23–2005; ASHRAE Standard 37–2005; ASHRAE Standard 41.1–86 (RA 01); ASHRAE Standard 41.2–87 (RA 92); ASHRAE Standard 41.6–94 (RA 01);ASHRAE Standard 41.9–00;ASHRAE Standard 51–99/AM	ENERGY STAR	April 1, 2006	For Central AC-Residential: AHRI 210/240: AHRI Standard 210/240-94,	The revised standard, scheduled to be updated by DOE in 2011, will become effective in 2016
	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule (Commercial AC)	March 10, 2009.	EnergyGuide	subpart F of part 431: AHRI Standard 210/240–2003;AHRI Standard 340/360–2004;ISO 13256–1;AHRI Standard 310/380–2004 (CSA–C744–04)	ENERGY STAR	April 1, 2006	For Central AC-Commercial: AHRI 210/240: ANSI/AHRI Standard 210/240-2008,	
Refrigerator & freezer	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Refrigerators, Refrigerator-Freezers and Freezers	.July 1, 2001	EnergyGuide	Appendix A1 to Subpart B of Part 430: HRF–1–1979;ANSI B 38.1–1970 Appendix B1 to Subpart B of Part 430: HRF–1–1979; ANSI B38.1–1970	ENERGY STAR	Jan 2008	(1) ANSI/NSF 7-2007; (2) UL Standard for Commercial Refrigerators and Freezers (UL-471).	A new national standard is under development
	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule (Supermarket (built-up) Refrigerators & Freezers, Refrigerator and Freezer Cases without Doors, Ice	March 10, 2009		Subpart C of Part 431 Subpart R of part 431				

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	Cream Freezers, Reach-In Refrigerators & Freezers, Walk-In Refrigerators Freezers)							
Lighting	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule (General Service Incandescent Lamps, Fluorescent Lamps, Tube Fluorescent Lamps, Compact Fluorescent Lamps(CFL))	September 14, 2009.	EnergyGuide	10 CFR part 430, subpart B	NA	NA	NA	
					ENERGY STAR	August 2008	ANSI C78.376-2001; ANSI C78.901– 2005 ; ANSI C78.5 – 1997; ANSI/IEEE C62.41 – 1991(01-May-1991) ;ANSI/IEC C81.61-2003;CIE Publication No. 13.3 – 1995 ;CIE Publication No. 18.2 – 1983 ;IESNA LM-9 – 1999; IESNA LM-16; IESNA LM-28-89 – 1989 ;IESNA LM-40 – 20	EPA has made a technical amendment to the to Version 4.2 specification which added test procedures for qualification of fixtures employing LED light engines
	10 CFR Part 431: Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment: Final Determination Concerning the Potential for Energy Conservation Standards for High-Intensity Discharge (HID) Lamps	August 2, 2010.	EnergyGuide	Under development	NA	NA	NA	DOE must complete a rulemaking to consider increased standards by January 1st, 2012. Any revision would be effective January 1st, 2015. A second review and potential revisions is due by January 1st, 2019 and would be effective January 1st, 2022
	EPACT 2005. 10 CFR Parts 430 Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment	October 18, 2005	EnergyGuide	Appendix AA to Subpart B of Part 430,	NA	NA	NA	

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	(Torchiere Lighting Fixtures)							
	NA	NA	NA	NA	ENERGY STAR	February 2009	LED Fixture: for LED ANSI C78.377-2008;ANSI C79.1–2002;ANSI C78.20 – 2003; ANSI C78.21 – 2003; ANSI C78.21 – 2003; ANSI/IEC C81.61-2003; ANSI/IEEE C62.41 – 1991 (01- May-1991); CIE Publication No. 13.3 – 1995; CIE Publication No. 18.2 – 1983; IESNA LM-16	
	10 CFR Parts 430 Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment 10 CFR Part 430 Energy Conservation Standards for Certain Ceiling Fan Light Kits	January 1, 2007	EnergyGuide	Appendix U to Subpart B of Part 430	ENERGY STAR	September 1, 2006	EPA's ENERGY STAR Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans.	
Computers & Monitors	NA	NA	NA	NA	ENERGY STAR	July 2009	For Computer: IPS: Generalized Internal Power Supply Efficiency Test Protocol Rev. 6.4.2; EPS: ENERGY STAR Test Method for External Power Supplies; ENERGY STAR Computer Test Method (Version 5.0),III, IV, V For Monitor: VESA,	

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
							ISO/IEC 17025.Energ Star Test P	
Televisions	NA	NA	EnergyGuide (Effective in May 2011)	NA	ENERGY STAR	Version 4.1 - May 1, 2010 ; Version 5.1 - May 1, 2012	Draft IEC 62301, Ed 2.0:IEC 62087, Ed 2.0:CEA-2037	
Clothes washers	10 CFR Part 430 Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards	The effective date of this rule is January 1, 2004, except that the effective date of the amendments to appendix J to subpart B of part 430 is February 12, 2001.	EnergyGuide	Appendix J to Subpart B of Part 430 Appendix J1 to Subpart B of Part 430	ENERGY STAR	effected on July 1, 2009	10 CFR Part 430 Subpart B App J , 10 CFR Part 430 Subpart B App J1 , AHAM HWL-1 , US ENERGY STAR Reference Test Standard: AHAM HWL-1	Jan. 1, 2011 (Scheduled Revision) with higher standard
Clothes driers	10 CFR Part 430: Energy Conservation Program for Consumer - Clothes Dryers	1994	EnergyGuide	Appendix D to Subpart B of Part 430	Green Seal's Environmental Standard for Lodging Properties	2009	NA	Updated DOE Standard Due: 2011
Water heating	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards	2004	EnergyGuide	Appendix E to Subpart B of Part 430	ENERGY STAR	2009	Chapter 11, Part 430, Subpart B of Part 430; SRCC-OG-300 rating	

	Mandatory Standard	Effective Date of the Standard	Mandatory Label	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	for Water Heaters (Residential Water Heater)							
	10 CFR Part 431: Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment (Commercial Water Heater)	October 21, 2004	EnergyGuide	Subpart G of Part 431				

Vietnam

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
AC	N/A	N/A			TCVN 7830:2007 Air-conditioners. Energy Efficiency Ratio	31-Dec-07	TCVN 7831:2007 Air-conditioners. Method for determination energy efficiency	
Refrigerator & freezer	N/A	N/A			TCVN 7828:2007 Refrigerator, refrigerator-freezer. Energy Efficiency Ratio	31-Dec-07	TCVN 7829:2007 Refrigerator, refrigerator-freezer. Method for determination energy efficiency	
Lighting	N/A	N/A			TCVN 8248:2009 Electromagnetic Ballasts for Fluorescent Lamps. Energy efficiency	2009	TCVN7541-2:2005;TCVN 7590-2-8:2006(IEC 61347-2-8:2006); TCVN 6479:2006(IEC 60921:2004)	
	N/A	N/A			TCVN 8249:2009 Tubular Fluorescent Lamps. Energy efficiency	2009	TCVN7541-2:2005;TCVN 7670:2007(IEC 60081:2003)	
	N/A	N/A			TCVN 8250:2009 High-pressure Sodium Vapor Lamps. Energy efficiency	2009	TCVN7451-2:2005;TCVN 7670:2007(IEC 60081:2003)	

	Mandatory Standard	Mandatory Label	Effective Date	Test Procedure	Voluntary Label	Effective Date	Test Procedure	Revision Plan
	N/A	N/A			TCVN 7896:2008 Compact Fluorescent Lamps (CFL). Energy efficiency	9-Dec-08	TCVN 7541-2:2005; TCVN 7673:2007(IEC 60969:2001); TCVN7863:2008(IEC60901:2004)	
	N/A	N/A			TCVN 7897:2008 Electronic ballasts for fluorescent lamps. Energy efficiency	9-Dec-08	TCVN 7541-2:2005; TCVN 7673:2007(IEC 60969:2001); TCVN7863:2008(IEC60901:2004)	
Computers & Monitors	N/A	N/A			N/A			
Televisions	N/A	N/A			N/A			
Clothes washers	N/A	N/A			N/A			
Clothes driers	N/A	N/A			N/A			
Water heating	N/A	N/A			TCVN 7898:2009 (Storage water heaters. Energy efficiency)	20-Apr-09		

Appendix B: APEC Economies' Product Matrix Summary Table

Air Condition

Room Air Condition

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS3823.1.1; AS/NZS3823.1.2; AS/NZS3823.1.3;	AS/NZS 3823.2:2009 - Performance of electrical appliances – Air conditioners and heat pumps Part2: Energy Labeling and minimum energy performance standard requirements	Energy Labeling for Single Phase Non-ducted Air Conditioners	Single and three phase non-ducted or ducted room air conditioners of the vapor compression type of up to 65kW cooling capacity (commercial or residential). It covers units with a single or multiple refrigeration systems with a single indoor control such as single packaged units (unitary), packaged ducted units (unitary), double and triple split systems and single split systems. It also covers water sourced heat pumps.	Energy Labeling for Three-phase Air Conditioners and Ducted	Three phase and ducted air conditioners	Air cooled condenser (EER); Water Source Heat Pumps and AC (EER and/or Coefficient of Performance for heating, COP), AEER and/or ACOP
Brunei Darussalam	None	None	None		None		
Canada	CAN/CSA-C368.1-M90	MEPS for Room Air Conditioners	EnerGuide	single-phase electric room air conditioners that are not "packaged terminal air conditioners" and that do not exceed 10.55 kilowatts (36 000 Btu/h).	ENERGY STAR for Room Air Conditioners	RAC units without reverse cycle and without internal heating elements designed for window mounting or through-the-wall mounting.	EER
Chile	ISO 5151 (1994), NCh3081.Of 2007	Energy Efficiency Standard for Air Condition	Energy Efficiency Label for Air Condition	Direct expansion of refrigerant gas, split type or unit type, without air distribution pipelines, to a thermal power of 12kw (42000 Btu/h) and are condensed by air. Electric heat pumps for heating water for swimming pools or any other use other than air conditioning and dehumidifiers are exempted.	NO		Cooling Capacity, Heating Capacity, IEE, COP

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
China	GB 19576-2004; GB/T 17758; GB/T 18836; JB/T 8072	GB 19576-2004 - The minimum allowable values of the energy efficiency and energy efficiency grade for unitary air conditioners	China Energy Label for unitary air conditioners	Cooling Capacity is greater than 7100W, with motor-driven compressor unit air conditioners, duct type and rooftop air conditioning units. Does not include VRF air conditioning (heat pump) units and conversion air conditioners.	China Energy Conservation Certification for unitary air conditioners	Cooling Capacity is greater than 7100W, with motor-driven compressor unit air conditioners, duct type and rooftop air conditioning units. Does not include VRF air conditioning (heat pump) units and conversion air conditioners.	EER
	GB 12021.3-2010; GB/T 7725-2004	GB 12021.3-2010 - The minimum allowable values of the energy efficiency and energy efficiency grade for room air conditioners	China Energy Label for room air conditioners	Using air cooling for the condenser, the whole closed motor compressor, cooling capacity in the 14000W and the following climate types for the T1 of the air conditioner. Does not apply to mobile, speed-controlled, multi-VRF air conditioning units。	China Energy Conservation Certification for room air conditioners		Cooling Capacity, EER
	GB 21455-2008; GB/T 7725	GB 21455-2008 - The minimum allowable values of the energy efficiency and energy efficiency grades for variable speed room air conditioner	China Energy Label for variable speed room air conditioners	Using air cooling for the condenser, closed speed-controlled electric compressor, cooling capacity in the 14000W and the following climate types T1 Does not apply to portable air conditioners, constant speed air conditioner, VRF air conditioning units.	China Energy Conservation Certification for variable room air conditioners	Using air cooling for the condenser, closed speed-controlled electric compressor, cooling capacity in the 14000W and the following climate types T1 Does not apply to portable air conditioners, constant speed air conditioner, VRF air conditioning units.	Cooling Capacity; SEER
	CQC 2209-2009; GB/T15765-2006; GB/T 18429-2001; GB/T 10079-2001; GB/T 19410-2008;	NA	N/A		China Energy Conservation Certification for hermetic motor-compressor for room air conditioners		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Hong Kong, China	ISO 5151	N/A	Mandatory Energy Efficiency Labeling Scheme for Room Air Conditioners	includes single package type and split type room air conditioners that (i) use mains electricity as the primary power source; (ii) operate by using the vapor compression cycle; (iii) are non-ducted; (iv) are air-cooled; (v) are of either cooling only type or reverse cycle type; and (vi) have a rated cooling capacity not exceeding 7.5 kilowatts.	Voluntary Energy Efficiency Labeling Scheme for Room Coolers	The scheme only cover ceiling-mounted type or floor standing type room coolers with a rated cooling capacity not exceeding 10 kW , and other types with cooling capacity larger than 7.5kW but not exceeding 10kW. Room coolers under this Labeling scheme only covers air-cooled non-ducted air-conditioners powered by electric current, either single unit or split system with a rated cooling capacity not exceeding 10 kW, and does not apply to fan-coil air conditioning units, heat pump, and water-cooled units. For room cooler with reverse cycle heat pump, only the cooling function will be considered and its heating function will be excluded. The scheme covers split system utilizing single refrigeration circuit and having one evaporator and one condenser but does not cover multi-circuit system.	to be researched
Indonesia	ISO 5151	MEPS for Room AC - split type	N/A		Voluntary label for ACs		
	ISO 5151	MEPS for Room AC - window type	N/A		N/A		
Japan	JIS B 8615-1;JIS B 8615-2;JIS B 8616;JIS	Top Runner Program for RAC(packaged	Label Display Program	Cooling-cum-heating air conditioners and dedicated	Energy Saving Labeling	Cooling-cum-heating air conditioners and dedicated	COP;APF; Calculation formula

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	C 9612	terminal)		cooling air conditioners, except the following: 1) ones with cooling capacity of over 50.4 kW, 2) ones of water-cooling type, 3) ones so structured as to have no motor for compression, 4) ones so structured as to use any energy other than electricity as a heat source for space heating, 5) ones so structured as to have temperature control function or dust control function intended for air conditioning to maintain machine or appliance performance or beverage or food hygiene, 6) ones so structured as to solely cool outside air and send it into indoors, 7) spot air conditioners, 8) ones designed for vehicles and other means of transport, 9) ones so structured as to have a duct at suction/exhaust outlet of a heat-exchanger of the outdoor unit, 10) ones so structured as to have a thermal storage tank dedicated for cooling (including cooling-cum-heating), 11) ones designed for highly gas-tight/heat-insulating housing, and so structured as to send air to multiple rooms through a branched duct and operate interlocked with ventilation devices, 12) ones so structured as to have compressors, air blowers and other main components powered by	Program	cooling air conditioners, except the following: 1) ones with cooling capacity of over 50.4 kW, 2) ones of water-cooling type, 3) ones so structured as to have no motor for compression, 4) ones so structured as to use any energy other than electricity as a heat source for space heating, 5) ones so structured as to have temperature control function or dust control function intended for air conditioning to maintain machine or appliance performance or beverage or food hygiene, 6) ones so structured as to solely cool outside air and send it into indoors, 7) spot air conditioners, 8) ones designed for vehicles and other means of transport, 9) ones so structured as to have a duct at suction/exhaust outlet of a heat-exchanger of the outdoor unit, 10) ones so structured as to have a thermal storage tank dedicated for cooling (including cooling-cum-heating), 11) ones designed for highly gas-tight/heat-insulating housing, and so structured as to send air to multiple rooms through a branched duct and operate interlocked with ventilation devices, 12) ones so structured as to have compressors, air blowers and other main components powered by electricity generated from a	

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				electricity generated from a dedicated solar cell module, 13) ones having floor heating function or hot-water supply function, 14) among separate type air conditioners so structured as to connect two or more indoor units to one outdoor unit, ones using heat absorbed by space cooling for space heating, 15) ones dedicated to space cooling use; 16) ones structured for installation in the window frame, 17) ones structured for installation penetrating a wall, and 18) among air conditioners with cooling capacity of over 28 kW, separate type ones so structured as to connect two or more indoor units to one outdoor unit (applicable only to ones each of whose indoor units is separately controlled).		dedicated solar cell module, 13) ones having floor heating function or hot-water supply function, 14) among separate type air conditioners so structured as to connect two or more indoor units to one outdoor unit, ones using heat absorbed by space cooling for space heating, 15) ones dedicated to space cooling use; 16) ones structured for installation in the window frame, 17) ones structured for installation penetrating a wall, and 18) among air conditioners with cooling capacity of over 28 kW, separate type ones so structured as to connect two or more indoor units to one outdoor unit (applicable only to ones each of whose indoor units is separately controlled).	
Korea	KS C 9306	MEPS for AC	Energy efficiency labeling for AC	Air-conditioners of rated cooling power consumption of not more than 7,500W and the rated cooling capacity of not more than 23,000W. If it has heater, the rated power consumption of heater shall be not more than 5,000W. Exclude water cooling, duct-type, portable, multi-split type	High-efficiency Appliance Certification Program - Multi-air conditioner	To be researched	AEER, Cooling Seasonal Performance Factor (CSPF), and Heating Seasonal Performance Factor (HSPF)
Malaysia	MS ISO 5151:2004	N/A	N/A		Energy efficiency rating and labeling for AC		
Mexico	NOM-021-ENER/SCFI-2008	Energy efficiency and user safety	Energy Efficiency Label		Sello FIDE for room air	Applicable to models of room air conditioner without reverse cycle	EER

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		requirements for room air conditioners			conditioners	(cooling) or reverse cycle (heating), with and without side grooves, with air-cooled condenser and refrigerant R22 or higher, with cooling capacity up to 10,600 Watts (36,000 BTU / h), fed a nominal voltage of 115 volts and 220 volts at a frequency of 60 Hz nominal.	
New Zealand	AS/NZS3823.1.1:1998 as amended, AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2005.	AS/NZS 3823.2:2005 - Performance of electrical appliances - Air conditioners and heat pumps - Energy Labeling and minimum energy performance standard	Energy Labeling for Single Phase Non-ducted Air Conditioners		1. Energy Labeling for Three-phase Air Conditioners and Ducted Single-phase Units 2.NEW ZEALAND ENERGY STAR® program (Criteria for Single Phase Air Conditioners and Heat Pumps Version 2)		EER; COP
Papua New Guinea	NO	NO	NO		NO		
Peru	NA	NA	NA		NA		
Russia	NA	NA	NA		NA		
Singapore	ISO 5151: 1994; JIS C 9612: 1994	NO	Mandatory Energy Labeling Scheme – RACs (Casement and Window)	Single-phase non-ducted room air-conditioner (not being second-hand goods) having a cooling capacity of - 8.8 kW or lower, in the case of casement or window type air-conditioner;	NO		COP100%; Weighted COP
	ISO 5151: 1994; JIS C 9612: 1994	NO	Mandatory Energy Labeling Scheme - RACs Split	Single-phase non-ducted room air-conditioner (not being second-hand goods) having a cooling capacity of - 10 kW or	NO		COP100%; Weighted COP

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				lower, in the case of split type (inverter) air-conditioner; or 17.6 kW or lower, in the case of split type (non-inverter) air-conditioner.			
Chinese Taipei	CNS 3615; CNS 14464	MEPS for Room Air Conditioners (Non-duct)	Energy Efficiency Rating and Labeling for Room Air Conditioners	to be researched	Energy Label Program for Non-ducted Air Conditioners	CNS 3615 for non-ducted air conditioners	Mandatory Standard: Power consumption, EER, COP; Voluntary Label: CC, EER
	CNS 3615, CNS 14464,CNS 7183	MEPS for Room Air Conditioners (Split)	N/A	Window/Wall-type Air Conditioners	N/A		
	CNS 3615, CNS 14464,CNS 7183	MEPS for Room Air Conditioners Packaged Terminal	N/A	Window/Wall-type Air Conditioners	N/A		
Thailand	TIS 1155-2536 (2002) , TIS 385-2524 (1990)	TIS 2134-2545 (2002): Room Air Conditioners Environment Requirements Energy Efficiency - RACs Window/Split	Mandatory Certification Mark		Energy Efficiency Label		
The Philippines	PNS240:1998/ISO 5151:1994	PNS 396-1:1998 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 1: Non-ducted air conditioners	PNS 396-1:1998 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 1: Non-ducted air conditioners		NA		
The United States	CFR 430 Subpart B, Appendix F: ANS Z234.1–1972: ASHRAE Standard	10 CFR Part 430 Energy Conservation Program for Consumer Products;	EnergyGuide	The program covers single-phase air conditioners that are not packaged terminal air conditioners.	ENERGY STAR	Capacity (Btu/Hr) with and without louvered sides: <6000, 6000 to 7999, 8000 to 13999, 14000 to 19999, >=20000;	SEER, HSPF; Maximum daily energy consumption, and

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	16–69	Conservation Standards for Room Air Conditioners;				Casement-only, Casement-slider; Reverse Cycle (Btu/Hr) Capacity: <14000, >=14000, <20000, >=20000	Air-cooled package terminal AC and Heat Pumps' EER and COP vary by capacity according to formula. (different formulas for new construction and replacement equipment
Vietnam	TCVN 7831:2007 Air-conditioners. Method for determination energy efficiency	NO	NO		TCVN 7830:2007 Air-conditioners. Energy Efficiency Ratio		

Note: Energy metrics for air conditioners using EER, COP, SEER, APF, HSPF, CSPF, and IPLV are not defined the same way in each of the APEC Member Economies. Therefore the listed metrics are not meant to be used as comparison rather than illustration of each APEC member economics' individual energy level indicator

Central Air Conditioners

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 4776 1.1; AS/NZS 4776 1.2	AS/NZS 4776.2-2008: Liquid-chilling packages using the vapor compression cycle - Minimum energy performance standard (MEPS) and compliance requirements	Energy Labeling for Non-ducted Air Conditioners		Energy Labeling for Three-phase Air Conditioners and Ducted		COP Integrated Part Load Value(IPLV)

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	AS/NZS 4965.1-2008	AS/NZS 4965.2-2008: Performance of close control air-conditioners - Minimum energy performance standard (MEPS) requirements	NO	This Standard covers equipment utilizing a single or multiple refrigerated direct expansion (DX) system designed to control and monitor temperature and humidity and may include supplementary conditioning equipment. The Standards are based on rating only the indoor unit where the compressor is part of the indoor unit. If the compressor is part of the outdoor unit the compressor power must be added to the indoor unit's power consumption.	NO		Min Energy Efficiency Ratio for cooling (EER)
Canada	CAN/CSA-C656-05	MEPS for Single-Phase and Three-Phase Single-Package Central Air Conditioners and Heat Pumps	NA	Permanently installed air-source air-conditioner and heat pumps. Equipment types include air conditioners and heat pumps that are single package and split system, single and three-phase, with rated capacity of less than 19 kW (65,000 Btu/h)	ENERGY STAR for Residential Air-Source Heat Pumps (ASHPs) and Central Air Conditioners		Seasonal Energy Efficiency Ratio (SEER), EER, Heating Seasonal Performance Factor (HSPF)
	CAN/CSA-C656-05	MEPS for Single-Phase and Three-Phase Split-System Central Air Conditioners and Heat Pumps	NA	Permanently installed air-source air-conditioner and heat pumps. Equipment types include air conditioners and heat pumps that are single package and split system, single and three-phase, with rated capacity of less than 19 kW (65,000 Btu/h)	ENERGY STAR for Residential Air-Source Heat Pumps (ASHPs) and Central Air Conditioners		Seasonal Energy Efficiency Ratio (SEER), EER, Heating Seasonal Performance Factor (HSPF)
	CAN/CSA-C744-04	MEPS for Packaged Terminal Air Conditioners and Heat Pumps	NA	Factory-assembled packaged terminal air conditioners and heat pumps (PTAC/HP). PTAC/HP has a wall sleeve and a separate unencased combination of heating and cooling assemblies intended for mounting through the wall. This equipment	N/A		Seasonal Energy Efficiency Ratio (SEER), EER, Heating Seasonal Performance Factor (HSPF)

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				intended for use in residential, commercial and industrial heating and cooling systems.			
China	GB21454-2008; GB/T 18837	GB21454-2008 The minimum allowable values of the IPLV and energy efficiency grades for multi-connected air-condition (heat pump) unit	China Energy Label for multi-connected air-condition (heat pump) unit	Climate type T1 of VRF air conditioning (heat pump) does not apply to dual and multi-refrigeration cycle refrigeration cycle system unit.	China Energy Conservation Certification for multi-connected air-condition (heat pump) unit	Climate type T1 of VRF air conditioning (heat pump) does not apply to dual and multi-refrigeration cycle refrigeration cycle system unit.	IPLV; HEPS
	GB 19577-2004; GB/T 18430; GB/T 10870	GB 19577-2004 - The minimum allowable values of the energy efficiency and energy efficiency grades for water chillers	China Energy Label for water chillers	Motor-driven compressors for infuriating compression cycle cold water (heat pump).	China Energy Conservation Certification for multi-connected air-condition (heat pump) unit		
	CQC 3106-2009; GB/T18431-2001; GB/T 18362-2008	The minimum allowable values of the energy efficiency and Energy Conservation Values for lithium bromide absorption water chiller	N/A	For direct-fired lithium bromide absorption chiller (temperature) water unit, steam lithium bromide absorption chiller energy saving certification. Include: air conditioning or process used to fuel direct combustion gas as heat source or steam as heat source, water as refrigerant, lithium bromide absorption of aqueous fluid to do, preparation of cold water (or warm) in the unit.	China Energy Conservation Certification for Lithium Bromide Absorption Water Chiller		Chilling water temperature Cold water temperature Vapor pressure mass flow rate per cooling capacity COP
	CQC3123-2010; GB/T19409-2003	The minimum allowable values of the energy efficiency and Energy Conservation Values for Water-source heat pumps	N/A		China Energy Conservation Certification for water source heat pumps	Applicable to electrical mechanical compression systems, water as cold (hot) source of household, industrial and commercial water use and similar certification of energy saving heat pump unit.	Cooling capacity; EER

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	CQC3126-2010; GB/T 19413-2003	N/A	N/A		China Energy Conservation Certification for unitary air conditioners for computer and data processing room		Cooling Capacity, EER
Japan	JIS B 8616; JIS C 9612	Top Runner Program for Central AC	Label Display Program	Cooling-cum-heating air conditioners and dedicated cooling air conditioners, except the following: 1) ones with cooling capacity of over 50.4 kW, 2) ones of water-cooling type, 3) ones so structured as to have no motor for compression, 4) ones so structured as to use any energy other than electricity as a heat source for space heating, 5) ones so structured as to have temperature control function or dust control function intended for air conditioning to maintain machine or appliance performance or beverage or food hygiene, 6) ones so structured as to solely cool outside air and send it into indoors, 7) spot air conditioners, 8) ones designed for vehicles and other means of transport, 9) ones so structured as to have a duct at suction/exhaust outlet of a heat-exchanger of the outdoor unit, 10) ones so structured as to have a thermal storage tank dedicated for cooling (including cooling-cum-heating), 11) ones designed for highly gas-	Energy Saving Labeling Program	Cooling-cum-heating air conditioners and dedicated cooling air conditioners, except the following: 1) ones with cooling capacity of over 50.4 kW, 2) ones of water-cooling type, 3) ones so structured as to have no motor for compression, 4) ones so structured as to use any energy other than electricity as a heat source for space heating, 5) ones so structured as to have temperature control function or dust control function intended for air conditioning to maintain machine or appliance performance or beverage or food hygiene, 6) ones so structured as to solely cool outside air and send it into indoors, 7) spot air conditioners, 8) ones designed for vehicles and other means of transport, 9) ones so structured as to have a duct at suction/exhaust outlet of a heat-exchanger of the	
	JIS B 8615-2; ISO 13253	Top Runner Program for Ducted AC and heat pumps	Label Display Program		Energy Saving Labeling Program		
	JIS B 8615-1; ISO 5151	Top Runner Program for Non-ducted AC	Label Display Program		Energy Saving Labeling Program		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				tight/heat-insulating housing, and so structured as to send air to multiple rooms through a branched duct and operate interlocked with ventilation devices, 12) ones so structured as to have compressors, air blowers and other main components powered by electricity generated from a dedicated solar cell module, 13) ones having floor heating function or hot-water supply function, 14) among separate type air conditioners so structured as to connect two or more indoor units to one outdoor unit, ones using heat absorbed by space cooling for space heating, 15) ones dedicated to space cooling use; 16) ones structured for installation in the window frame, 17) ones structured for installation penetrating a wall, and 18) among air conditioners with cooling capacity of over 28 kW, separate type ones so structured as to connect two or more indoor units to one outdoor unit (applicable only to ones each of whose indoor units is separately controlled).		outdoor unit, 10) ones so structured as to have a thermal storage tank dedicated for cooling (including cooling-cum-heating), 11) ones designed for highly gas-tight/heat-insulating housing, and so structured as to send air to multiple rooms through a branched duct and operate interlocked with ventilation devices, 12) ones so structured as to have compressors, air blowers and other main components powered by electricity generated from a dedicated solar cell module, 13) ones having floor heating function or hot-water supply function, 14) among separate type air conditioners so structured as to connect two or more indoor units to one outdoor unit, ones using heat absorbed by space cooling for space heating, 15) ones dedicated to space cooling use; 16) ones structured for installation in the window frame, 17) ones structured for installation penetrating a wall, and 18) among air conditioners with cooling capacity of over 28 kW,	

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						separate type ones so structured as to connect two or more indoor units to one outdoor unit (applicable only to ones each of whose indoor units is separately controlled).	
Mexico	NOM-011-ENER-2006	Energy efficiency in central air conditioning, package or split	Energy Efficiency Label		Sello FIDE for central air conditioners packaged and split	Applicable to models of Central Type Air Conditioner Split Package or without reverse cycle (cooling) or reverse cycle (heating), air-cooled condenser and refrigerant R22 or higher, with cooling capacity of 10,540 Watts (36,000 BTU / h) to 17,580 Watts (60,000 BTU / h), fed a nominal voltage of 220 volts or 230 volts at a frequency of 60 Hz nominal	REEE (Seasonal Energy Efficiency Ratio) in W_T/W_E (BTU/Wh)
New Zealand	AS/NZS3823.1.1:1998 as amended, AS/NZS3823.1.2:2001 as amended, or AS/NZS3823.3:2002; AS/NZS3823.3:2009	AS/NZS 3823.2:2005 - Performance of electrical appliances – Air conditioners and heat pumps - Energy Labeling and minimum energy performance standard	Energy Labeling for Single Phase Non-ducted Air Conditioners		1. Energy Labeling for Three-phase Air Conditioners and Ducted Single-phase Units 2.NEW ZEALAND ENERGY STAR® program (Criteria for Single Phase Air Conditioners and Heat Pumps Version 2)		EER; COP
Chinese Taipei	CNS 12575, CNS 12812	MEPS for Water Chiller	N/A		N/A		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
The United States	CFR 430 Subpart B, Appendix M: AHRI Standard 210/240–2006; ASHRAE Standard 23–2005; ASHRAE Standard 37–2005; ASHRAE Standard 41.1–86 (RA 01); ASHRAE Standard 41.2–87 (RA 92); ASHRAE Standard 41.6–94 (RA 01);ASHRAE Standard 41.9–00;ASHRAE Standard 51–99/AM	10 CFR Part 430 Energy Conservation Program for Consumer Products: Central Air Conditioners and Heat Pumps Energy Conservation Standards;	EnergyGuide	The program covers single-phase product, other than a packaged terminal air conditioner, which is air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling only unit.	ENERGY STAR	A. ASHPs: This specification shall cover residential ASHPs that are rated below 65,000 Btuh and powered by single-phase current. The ASHP may be a single packaged system, where there is only one assembly, or a split system where there are two. B. Central Air Conditioners: This specification shall cover residential central air conditioners that are rated below 65,000 Btuh, and powered by single-phase current. The central air conditioner may be a single packaged system, where there is only one assembly, or a split system where there are two. C. Gas/Electric Package Units: This specification shall cover gas/electric package units that are rated below 65,000 Btuh.	
	subpart F of part 431: AHRI Standard 210/240–2003;AHRI Standard 340/360–2004;ISO 13256–1;AHRI Standard 310/380–2004 (CSA–C744–04)	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule	EnergyGuide		ENERGY STAR		

Note: Energy metrics for air conditioners using EER, COP, SEER, APF, HSPF, CSPF, and IPLV are not defined the same way in each of the APEC Member Economies. Therefore the listed metrics are not meant to be used as comparison rather than illustration of each APEC member economics' individual energy level indicator

Refrigerators and Freezers

Household Refrigerators/Freezers

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS4474.1:2007/Amdt1:2008	AS/NZS 4774.2-2009: Performance of household electrical appliances-Refrigerating appliances Part 2: Energy Labeling and minimum energy performance standard requirements	Energy Labeling for Household Refrigerators and Freezers	Refrigerators, freezers and refrigerator-freezers which intended for household or similar use and which: •operate using the vapor compression cycle; and •use mains electricity (230/240 Volts at 50 Hz) as the primary power source.	none		MEPS: maximum permitted energy, using MEPS Formula
Brunei Darussalam		n/a	n/a		under development		
Canada	CAN/CSA C300-08; Test Criteria for ENERGY STAR in Canada is harmonized with Test Criteria for ENERGY STAR in the United States: Residential Refrigerator 10 CFR 430, Subpart B, Appendix A1; Residential Freezer 10 CFR 430, Subpart B, Appendix B1	MEPS for Household Refrigerators, Refrigerator-Freezers and Wine Chillers; MEPS for Household Freezers	Energy Guide Label		ENERGY STAR for Refrigerators, Refrigerator-Freezers and Freezers		MEPS: Maximum annual energy consumption (kWh/year)
Chile	ISO 15502 (2005)		Etiquetado de Eficiencia Energetica(Energy efficiency labels),NCh3000.Of2006		n/a		
China	GB 12021.2-2008; GB/T 8059	The maximum allowable values of	China Energy Label for household		China Energy Conservation		Energy Efficiency Index=Actual daily

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		the energy consumption and energy efficiency grade for household refrigerators	refrigerators		Certification for household refrigerators		energy consumption from test /standard daily energy consumption
Hong Kong, China	ISO 15502 IEC 62552 ISO 7371 ISO 8187 ISO 8561 ISO 5155	n/a	Mandatory Energy Efficiency Labeling Scheme for Refrigerating Appliances		Voluntary Energy Efficiency Labeling Scheme for Household Refrigeration Appliances		energy efficiency index= actual appliance annual energy consumption from energy consumption test/ average annual energy consumption as determined in the standard
Indonesia	SNI IEC 15502-2009 Voluntary label: SNI 04-6710-2002; SNI 04-6711-2002; SNI 04-6958-2003	Minimum energy performance standard for household refrigerators	n/a		Voluntary label for refrigerators		
Japan	JIS C 9801(1999); JIS C 9801(2006)	Top Runner Program for Refrigerators-Freezers	Label Display Program	Electric refrigerators including ones combined with a freezer, except the followings: 1) ones using thermo-elements, 2) ones produced for industrial use, and 3) ones of absorption type.	Energy Saving Label Program	Electric refrigerators including ones combined with a freezer, except the followings: 1) ones using thermo-elements, 2) ones produced for industrial use, and 3) ones of absorption type.	Limitation on annual energy consumption
Korea	KS C ISO 15502	MEPS for refrigerators; MEPS for freezers	Energy efficiency labeling for refrigerators; for freezers		N/a		Maximum Monthly electric power consumption
Malaysia	ISO 8561 : 2000	n/a	n/a		Energy efficiency rating and labeling for refrigerators		
Mexico	NOM-015-ENER-2002	Energy efficiency of refrigerators and freezers appliances	Energy Efficiency Label		Sello FIDE for Refrigerators and Freezers	Applicable to models of refrigerators and freezers operated by	The limits of maximum power consumption are determined by

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						hermetic compressor with rated input voltage of 127 volts at a frequency of 60 Hertz, with any of the following types of icing: Manual Semiautomatic Partially automated Automatic Automatic long-term Adjustable Automatic	applying the formulas to appliances for their type, de-icing and set volume: Adjusted Volume = V_{food} + (FA x $V_{freezer}$)
New Zealand	AS/NZS 4474.1:2007	AS/NZS 4774.2-2009: AS/NZS4474: Performance of household electrical appliances-Refrigerating appliances Part 2: Energy Labeling and minimum energy performance standard requirements	Energy Labeling for Domestic Fridges and Freezers		NEW ZEALAND ENERGY STAR® program (Criteria for Refrigerators and Freezers)		MEPS: maximum permitted energy, using MEPS Formula
Peru	NTP 399 483 2007	Peruvian Technical Standard NTP 399 483 2007 Energy Efficiency for refrigerators, refrigerators-freezers and freezers for domestic use	Energy Efficiency Label		n/a		
Russia	GOST 30204-1995 (Household electrical refrigerating appliances. Performance and test methods)	Underdevelopment	Under development, effective on Jan 1, 2011		Energy conservation. Household electrical refrigeration appliances. Efficient of energy consumption. Determination methods		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Singapore	IEC 62552 ISO 15502	Will be implemented in 2011	Mandatory Energy Labeling Scheme – Refrigerators		n/a		Annual Energy Consumption (AEC) in kWh
Chinese Taipei	CNS 2062-95 CNS 9577-89	MEPS: Refrigerators-Freezers - Chinese Taipei	Energy Efficiency Rating for Refrigerator/Freezers		n/a		Limitation on Energy Factor= V/WM (WM, monthly power consumption V, Equivalent interior capacity)
Thailand	TIS 2186-2547 (2004); IEC 62552	TIS 2186-2547 (2004) Household Refrigerator: Environment Requirements; Energy Efficiency	Mandatory Certification Mark		Energy Efficiency Label (Criteria for one- and two-door models)		
The Philippines	PNS1474:1997/ISO 5155:1995; PNS1475:1997/ISO 7371 :1995; PNS 1476:1996/ISO 8187:1991;PNS 1477:1996/ISO 8561:1995	PNS 396-2:1997 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 2: Refrigerators and freezers	PNS 396-2:1997 Household appliances - Energy efficiency ratio (EER) and labeling requirements - Part 2: Refrigerators and freezers		n/a		
The United States	Appendix A1 to Subpart B of Part 430: HRF–1–1979; ANSI B 38.1–1970 Appendix B1 to Subpart B of Part 430: HRF–1–1979; ANSI B38.1–1970 Voluntary Label: (1) ANSI/NSF 7-2007; (2) UL Standard for Commercial Refrigerators and Freezers (UL-471).	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Refrigerators, Refrigerator-Freezers and Freezers （ Docket No. EE–RM–93–801）	Energy Guide Label		ENERGY STAR-Refrigerators and Freezers		Limitation on maximum energy consumption per year;
Vietnam	TCVN 7829:2007 Refrigerator, refrigerator-freezer. Method for determination energy efficiency				TCVN 7828:2007 Refrigerator, refrigerator-freezer. Energy Efficiency Ratio		

Commercial Refrigeration

Economy	Test Method/ Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS 1731.(1-13)-2003	AS 1731.14-2003: Refrigerated display cabinets - Minimum energy performance standard requirements	None		None		Total energy consumption(TEC) per Total display area(TDA)
Canada	ASHRAE standard 117-1992 ASHRAE standard 72-1998 AHRI Standard 1200-2008,Method of Testing Commercial Refrigerators and Freezers" （Voluntary label）	MEPS for Self-Contained Commercial Refrigerator & Freezer	n/a		ENERGY STAR for Commercial Refrigerators and Freezers		MPES: Maximum daily energy consumption of the product expressed in kilowatt hours per day.
China	Under Development: The minimum allowable values of the energy efficiency and Energy efficiency grades for commercial refrigerator						
Korea	KS C ISO 15502	MEPS for Commercial Refrigerators	Energy efficiency labeling for Commercial Refrigerators		N/a		Maximum Monthly electric power consumption
Mexico	NOM-022-ENER/SCFI-2008	Energy efficiency and user safety requirements for self-contained commercial refrigeration	Energy Efficiency Label		Sello FIDE for Commercial Refrigeration	Applicable to models of self-contained commercial refrigeration equipment such as coolers, freezers, cabinets closed and conservative ice packs supplied at a nominal voltage of 110, 115, 127 and 220 volts at a frequency of 60 Hz	Values limit consumption of energy per liter (kWh/L in 24h)
New Zealand	AS 1731 Parts 1 to 13:2003	AS 1731.14:2003: Refrigerated display	None		None		Total energy consumption(TEC) per

Economy	Test Method/ Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		cabinets—Minimum energy performance standard (MEPS)					Total display area(TDA)
Thailand	EN 441: 1996	Under development: Minimum allowable values for energy efficiency	None		None		
The United States	Subpart C of Part 431, Subpart R of part 431 Voluntary Label: (1) ANSI/NSF 7-2007; (2) UL Standard for Commercial Refrigerators and Freezers (UL-471).	10 CFR Part 431 Energy Conservation Program for Commercial and Industrial Equipment; Final Rule	Energy Guide Label		ENERGY STAR		Voluntary label: maximum daily energy consumption requirements

Domestic and Commercial Lighting

Compact Fluorescent Lamps (CFL)

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 4847.1:2010; AS/NZS 4782.3(Int):2006	AS/NZS 4847.2-2010: Self-ballasted lamps for general lighting services - MEPS requirements	n/a	Self-ballasted CFLs with integrated means for controlling starting and stable operation that are intended for domestic and similar general lighting purposes.	n/a	n/a	Starting time, Run-up time, Luminous flux, efficacy and lumen maintenance, Power, power factor and harmonics, Premature lamp failure rate, Low temperature starting, Switching withstand, Lamp life, Color attributes and Mercury content. 3 tiers of MEPS: Loca
Canada	CSA C861-06 for power and luminous flux; IES LM65-01 for life **Voluntary label:** IESNA	MEPS-CFL package Labeling	n/a	An integrally-ballasted compact fluorescent lamp with a medium screw base and a nominal voltage or	ENERGY STAR for CFLs	Same with the US ENERGY STAR product definition	EnerGuide: Lamp package Labeling required: light output (lumens), energy used (watts), and life

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	– LM66-00,IESNA – LM65 & ANSI – C78.5,CIE Publication 13.3 - 1995,ANSI/IEEE C62.41 (01-May-1991), Category A, 7 strikes, FCC 47 CFR including Part 2 (Equipment Authorization) and Part 18 (Technical Standards and Emission Limits) for consumer RF Lighting Equipment limits Industry Canada - ICES-005: Radio Frequency Lighting Device Regulation			voltage range that lies at least partially between 100 volts and 130 volts			(hours). Voluntary Label: Minimum Efficacy,1,000-hour Lumen Maintenance, Lumen Maintenance at 40% of Rated Life, CCT, CRI. The Efficacy requirements are categorized by different lamp type (e.g. Bare lamp, covered lamp) and lamp power
Chile	NCh3020.Of2006 IEC 60969 (2001)	None	Energy Efficiency - CFL for General lighting - Classification and Labeling	CFL for general lighting with a nominal power up to 60W, nominal voltage between 100v-250v; Edison or Bayonet screw cap under the scope of standard IEC 60969 (2001).	None		: Lamp package Labeling required: light output (lumens), energy used (watts), and life (hours);
China	GB19044-2003; GB/T17263; (ref:IEC 60969)	GB19044-2003 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for self-ballasted fluorescent lamps for general lighting service	China Energy Label for self-ballasted fluorescent lamps for general lighting service	This standard applies to rated voltage 220V, frequency 50Hz AC power, no more than nominal power of 60W , screw caps or snap caps, for family and similar general lighting purposes. The self-ballasted fluorescent lamps integrated the starting control and stable ignition components. This standard does not apply with covered self-ballasted fluorescent lamps.	China Energy Conservation Certification for self-ballasted fluorescent lamps for general lighting service	This standard applies to rated voltage 220V, frequency 50Hz AC power, no more than nominal power of 60W, screw caps or snap caps, for family and similar general lighting purposes. The self-ballasted fluorescent lamps integrated the starting control and stable ignition components. This standard does not apply with covered self-ballasted fluorescent lamps.	Initial light efficiency-criteria are set according to different nominal power and CCT categories.
Hong	IEC 60969, CIE 84	None	Mandatory	(a) Means a type of	None		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Kong, China			Energy Efficiency Labeling Scheme for Compact Fluorescent Lamps	fluorescent lamp which has a single lamp cap; and (b) includes integrated type compact fluorescent lamps that– (i) use mains electricity as the primary power source; (ii) have rated lamp wattage up to 60 watts; and (iii) have a screw or bayonet cap.			
		None	None		Voluntary Energy Efficiency Labeling Scheme for Non-integrated Type Compact Fluorescent Lamps	Non-integrated type CFLs which is electrically connected to permanently wired external ballast and is intended for general lighting purposes having the following characteristics: (a) those with a rated voltage of 220 volts; (b) those with a rated input current frequency of 50 Hz.; and (c) those with rated lamp wattage up to 60 watts. The scheme shall apply to non-integrated type CFLs designed for multi-level and/or dimming operation.	Minimum allowable luminous efficacy (lm/w) set into 3 categories based on rated lamp wattage (<11W, 11<=L<=30W, >30W)
Japan	JIS C 7601; JIS C 8105-3	Top Runner Program for Fluorescent Lamps	Label Display Program	Lighting equipment using only a fluorescent lamp or lamps as the main light source, except the following: 1) ones of explosion-proof type, 2) ones of heat-resistant type, 3) ones of dust-proof type, 4) ones of anticorrosion type, 5) ones designed for vehicles and other means of transport, 6) ones of wall-hung type, pendant type for service facilities or built-in type using fluorescent lamps	Energy Saving Labeling Program	Lighting equipment using only a fluorescent lamp or lamps as the main light source, except the following: 1) ones of explosion-proof type, 2) ones of heat-resistant type, 3) ones of dust-proof type, 4) ones of anticorrosion type, 5) ones designed for vehicles and other means of transport, 6) ones of wall-hung type, pendant type for service facilities or built-in type using fluorescent lamps	Standard energy consumption efficiency

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				of less than 40 watts, 7) ones designed for use in or on mining or manufacturing machinery, 8) ones designed for use in or on furniture, 9) ones whose bayonet base and fluorescent lamp stabilizer are structurally integrated (ones using a compact fluorescent lamp or lamps with built-in stabilizer), and 10) ones whose globe for fluorescent lamp protection is transparent. Bulb-shaped fluorescent lamps including: 11) ones so structured as to have a reflector (reflection type), 12) ones having a function to regulate light flux (for dimming purpose), 13) ones emitting light of any other color than that of daylight, daylight white, white, warm white or usual electric bulb color (such as color lamps or black lights), 14) ones designed for use in henhouse, and 15) ones allowing separation of fluorescent lamp (separable stabilizer type).		of less than 40 watts, 7) ones designed for use in or on mining or manufacturing machinery, 8) ones designed for use in or on furniture, 9) ones whose bayonet base and fluorescent lamp stabilizer are structurally integrated (ones using a compact fluorescent lamp or lamps with built-in stabilizer), and 10) ones whose globe for fluorescent lamp protection is transparent. Bulb-shaped fluorescent lamps including: 11) ones so structured as to have a reflector (reflection type), 12) ones having a function to regulate light flux (for dimming purpose), 13) ones emitting light of any other color than that of daylight, daylight white, white, warm white or usual electric bulb color (such as color lamps or black lights), 14) ones designed for use in henhouse, and 15) ones allowing separation of fluorescent lamp (separable stabilizer type).	
Korea					High-Efficiency Appliance Certification Programs for Fluorescent Lamps	including 26mm 32W fluorescent lamps, Compact fluorescent lamps, FPL 32W compact fluorescent lamps, T-5 fluorescent lamps	
Mexico	NOM-017-ENER/SCFI-	Energy	None	all compact fluorescent lamps	Sello FIDE for	Applicable to models of	Minimum Efficiency (lm/W)

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	2008; NMX-J-295-ANCE	efficiency and security requirements of compact fluorescent lamps		(LFCA) without surround, and surround with integrated reflector, based Edison E-12, E-14, E-26, E-27, E-39, E-40 and type-based Bayonet B-22, voltages of 100 V to 277 V AC, 50 Hz or 60 Hz, manufactured, imported or marketed in the economy. CFLs exclude (LFCA) that incorporate the body of the control accessories such as photocells, motion detectors, radio controls, or dimmers. Also, excluded are modular compact fluorescent lamps.	CFLs	compact fluorescent lamps not ballasts, tube-shaped single, double, triple and long twin tube T4 or T5.	criteria is set based on different lamp categories and rated lamp power
New Zealand		under consideration (would be likely to align standards with Australia)	n/a		NEW ZEALAND ENERGY STAR® program (Criteria for Compact Fluorescent Lamps)	Same with the US ENERGY STAR product definition	Minimum Efficacy,1,000-hour Lumen Maintenance, Lumen Maintenance at 40% of Rated Life, CCT, CRI. The Efficacy requirements are set based on different lamp type (e.g. Bare lamp, covered lamp) and lamp power
Peru	NTP 370101-2 2008	Peruvian Technical Standard NTP 370101-2 2008 Energy Efficiency for circular, linear, and compact fluorescent and similar lamps for household use	Energy Efficiency Label		None		Minimum criteria of initial luminous efficiency set up based on rated lamp watts (5, 9, 15, 25, 60 watts)
Chinese Taipei	CNS14567	MEPS for Compact	under development		Energy Label Program for		Luminous efficiency requirements, categorized

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		Fluorescent Lamps			Compact Fluorescent Lamps		by tube types and rated power
Thailand	TIS 2233 , IEC 60969	Voluntary Standard: TIS 2310-2549 (2006) Self-Ballasted Lamps for General Lighting Services: Energy Efficiency Requirements	None	MEPS covers self-ballasted lamps for general lighting services, with rated wattage not exceeding 60 watts and having rated voltage of 220 V to 230 V 50 Hz.	Energy Efficiency Label		lamp life of 6000hrs; Efficacy criteria is set based on CCT and rated power
The Philippines	PNS 969:2006; Voluntary Label: IEC60969	PNS 2050-2:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 2: Self-ballasted lamps for general lighting services	PNS 2050-2:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 2: Self-ballasted lamps for general lighting services	Self-ballasted lamps for domestic and similar general lighting service, having a rated voltage up to 230 V 60 Hz with Edison screw or bayonet caps.	Efficient Lighting Initiative Program - CFLs		
The United States	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	EnergyGuide		ENERGY STAR	A. Medium (Edison) or candelabra screw base CFLs with integral electronic ballasts. B. Circular lamps with a maximum diameter of nine inches and square lamps, with a maximum side length of eight inches with medium screw with electronic ballasts that are tested and packaged with the lamp. C. Medium (Edison) or candelabra screw base FLs with integral electronic	Voluntary Label: Minimum Efficacy,1,000-hour Lumen Maintenance, Lumen Maintenance at 40% of Rated Life, CCT, CRI. The Efficacy requirements are categorized by different lamp type (e.g. Bare lamp, covered lamp) and lamp power

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						ballasts, which have a translucent cover over the bare fluorescent tube. D. Medium (Edison) screw base CFLs with integral electronic ballasts, which have a reflector that may be open or enclosed. The lamp shall be primarily intended to replace wide beam incandescent reflector lamps.	
Vietnam					TCVN 7896:2008 Compact Fluorescent Lamps (CFL). Energy efficiency		

Fluorescent Lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 4782.1:2004; AS/NZS 4782.3 (Int):2006	AS/NZS 4782.2:2004: Double-capped fluorescent lamps - Performance specifications - Minimum Energy Performance Standard	n/a	FD and FDH lamps ranging from 550mm to 1500mm in length (inclusive) and having a nominal lamp power of 16 Watts or more.	n/a	n/a	MINIMUM LAMP EFFICACY(initial efficacy (at 100 hours) and the maintained efficacy (at 5000 hours)) AND COLOUR RENDERING REQUIREMENTS, categorized by Lamp nominal length L
Canada	CAN/CSA-C819-95 (2001)	MEPS for General Service Fluorescent Lamps	EnerGuide	a) rapid-start straight-shaped FL with a nominal overall length of 1200 mm, a medium bi-pin base and a nominal power of not less than 28 W; b)a rapid-start straight-shaped FL with a	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps		Minimum average CRI and Minimum average Lamp Efficiency Criteria are set based on different lamp length

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				nominal overall length of 2400 mm, a recessed double-contact base, a nominal power of not less than 95 W and a nominal current of 0.8 A; c) a rapid-start U-shaped fluorescent lamp with a nominal overall length of not less than 560 mm (22 inches) and not more than 635 mm (25 inches), a medium bi-pin base and a nominal power of not less than 28 W; d) an instant-start straight-shaped fluorescent lamp with a nominal overall length of 2400 mm (96 inches), a single-pin base and a nominal power of not less than 52 W; and e) any fluorescent lamp that is a physical and electrical equivalent of a lamp described in paragraphs (a), (b), (c) or (d);			and nominal lamp wattage.(35W, 65W, 100W; 1200mm, 560mm, 2400mm)
Chile	NCh3010.Of2006 IEC 60064 (2005)	None	Energy Efficiency - Double-capped fluorescent - Classification and Labeling	Double capped fluorescent lamps for general lighting, according to the scope and field of application of IEC 60081 (2002), with appendix A1:2000, A2: 2003, and A3: 3005. exempted from this requirement are lamps with a length exceeding 1200 mm and the lamps whose power exceeds 40W nominal	None	n/a	
	NCh3020.Of2006 IEC 60901 (2001)	None	Energy Efficiency - Socket only fluorescent - Classification and Labeling	Socket only fluorescent lamps for general lighting, according to the scope and field of IEC 60901 (2001), with Appendix A1:1997, A2: 2000, and A3: 2004.	None	n/a	
China		GB19043-2003 The	n/a	This standard applies to the	Energy conservation	This standard applies to the	Initial light efficiency:

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for double-capped fluorescent lamps for general lighting service		nominal power of 14W to 65W, using the AC power frequency with cathode preheating starter double-ended fluorescent lamps and the use of high frequency preheating cathode double-capped fluorescent lamps.	certification rules for double-capped fluorescent lamps for general lighting service	nominal power of 14W to 65W, using the AC power frequency with cathode preheating starter double-ended fluorescent lamps and the use of high frequency preheating cathode double-capped fluorescent lamps.	the criteria is categorized by rated power and CCT.(14-21W, 22-35W, 36-65W;)
	GB 19415-2003; GB/T 17262	GB 19415-2003 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for single-capped fluorescent lamps	n/a	The single-capped fluorescent lamps with a pre-warm cathode along with the boot device or using external starting	China Energy Conservation Certification for single-capped fluorescent lamps	The single-capped fluorescent lamps with a pre-warm cathode along with the boot device or using external starting	Efficacy by lamp types, rated power, and CCT
Japan	JIS C 7601, IEC 60901	Top Runner Program for Fluorescent Lamps	Label Display Program	Lighting equipment using only a fluorescent lamp or lamps as the main light source, except the following: 1) ones of explosion-proof type, 2) ones of heat-resistant type, 3) ones of dust-proof type, 4) ones of anticorrosion type, 5) ones designed for vehicles and other means of transport, 6) ones of wall-hung type, pendant type for service facilities or built-in type using fluorescent lamps of less than 40 watts, 7) ones designed for use in or on mining or manufacturing machinery, 8) ones designed for use in or on furniture, 9) ones whose bayonet base and fluorescent lamp stabilizer are structurally integrated (ones using a compact fluorescent lamp or lamps with built-in stabilizer),	Energy Saving Labeling Program	Lighting equipment using only a fluorescent lamp or lamps as the main light source, except the following: 1) ones of explosion-proof type, 2) ones of heat-resistant type, 3) ones of dust-proof type, 4) ones of anticorrosion type, 5) ones designed for vehicles and other means of transport, 6) ones of wall-hung type, pendant type for service facilities or built-in type using fluorescent lamps of less than 40 watts, 7) ones designed for use in or on mining or manufacturing machinery, 8) ones designed for use in or on furniture, 9) ones whose bayonet base and fluorescent lamp stabilizer are structurally integrated (ones using a	Standard energy consumption efficiency

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				and 10) ones whose globe for fluorescent lamp protection is transparent. Bulb-shaped fluorescent lamps including: 11) ones so structured as to have a reflector (reflection type), 12) ones having a function to regulate light flux (for dimming purpose), 13) ones emitting light of any other color than that of daylight, daylight white, white, warm white or usual electric bulb color (such as color lamps or black lights), 14) ones designed for use in henhouse, and 15) ones allowing separation of fluorescent lamp (separable stabilizer type).		compact fluorescent lamp or lamps with built-in stabilizer), and 10) ones whose globe for fluorescent lamp protection is transparent. Bulb-shaped fluorescent lamps including: 11) ones so structured as to have a reflector (reflection type), 12) ones having a function to regulate light flux (for dimming purpose), 13) ones emitting light of any other color than that of daylight, daylight white, white, warm white or usual electric bulb color (such as color lamps or black lights), 14) ones designed for use in henhouse, and 15) ones allowing separation of fluorescent lamp (separable stabilizer type).	
Korea	KS C 7601	MEPS for Fluorescent Lamp	Energy Efficiency Label for Fluorescent Lamp	are the tubular type of rated power consumption of 20W, 28W, 32W, and 40W, the circular type of rated power consumption of 32W, and 40W, and the compact type of rated power consumption of FPX 13W, FDX 26W, FPL 27W, FPL32W, FPL 36W, FPL36W, FPL 45W, and FPL 55W	High-Efficiency Appliance Certification Programs for Fluorescent Lamps	(including 26mm 32W fluorescent lamps, Compact fluorescent lamps, FPL 32W compact fluorescent lamps, T-5 fluorescent lamps)	MEPS: Efficacy criteria is set into rated power of 20w, 40, 32W categories for Tubular; 32W and 40W categories for circular
Malaysia		N/A	N/A		Energy efficiency rating and labeling for electric lamps (fluorescent and LED lamps)		
Mexico	NMX-J-295-ANCE; IES-LM 66	None	None		Sello FIDE for Fluorescent Lamps	applicable to Self-Ballasted Circular Fluorescent Lamp T5	Minimum Efficiency (lm/W) criteria is set

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						or T9 bulbous, electromagnetic or electronic adapter, base E-26 or E-27 and supply voltages of 120V and 127V ± 10% and operating frequency 60 Hz	based on different lamp categories and rated lamp power
New Zealand	AS/NZS 4782.1:2004	AS/NZS 4782.2:2004: Double-capped fluorescent lamps—Performance specifications—Minimum Energy Performance Standard (MEPS)	n/a	FD and FDH lamps ranging from 550mm to 1500mm in length (inclusive) and having a nominal lamp power of 16 Watts or more.	n/a	n/a	MINIMUM LAMP EFFICACY(initial efficacy (at 100 hours) and the maintained efficacy (at 5000 hours)) AND COLOUR RENDERING REQUIREMENTS, categorized by Lamp nominal length L
Peru	NTP 370101-2 2008	Peruvian Technical Standard NTP 370101-2 2008 Energy Efficiency for circular, linear, and compact fluorescent and similar lamps for household use	Energy Efficiency Label		None	n/a	Using initial luminous efficiency to mark the minimum standard, the criteria is set based on rated lamp power and color temperature.(<,>5000k)
Chinese Taipei	CNS 14125	MEPS for Self-ballasted Fluorescent Lamps	Under development		Energy Label Program for Fluorescent Lamps		
		None	Under development		Energy Label Program for Fluorescent Lamps with Embedded Ballasts		
Thailand	TIS 1713	Voluntary: TIS 2334-2550 (2007) Single-capped fluorescent lamps: energy efficiency requirements	None		None	n/a	
	TIS 236	Voluntary: TIS 2309-	None		Energy Efficiency Label	n/a	

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		2549 (2006) Double-Capped Fluorescent Lamps: Energy Efficiency Requirements					
The Philippines	PNS IEC 60081:2006	PNS 2050-1-1:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 1-1: Double-capped fluorescent lamps	PNS 2050-1-1:2007 Lamps and related equipment - Energy efficiency and labeling requirements - part 1-1: Double-capped fluorescent lamps	Double-capped fluorescent lamps for general lighting service.	Efficient Lighting Initiative Program - Double-capped fluorescent lamps		
	PNS IEC 60921:2001 Amd.01,02&03:2006	N/a	PNS 2050-1-2:2006 Lamps and related equipment - Energy labeling requirements - part 1-2: Single-capped fluorescent lamps	Single-capped fluorescent lamps for general lighting service.	N/A	n/a	
The United States	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	EnergyGuide	GENERAL SERVICE FLUORESCENT LAMPS (4-foot medium Bipin; 2-foot U-shaped 8-foot slim line; 8-foot high output; 4-Foot Miniature Bipin Standard Output; 4-Foot Miniature Bipin High Output) I	N/A	n/a	Efficacy criteria set based on product type(4-foot, 8-foot), and ranged by CCT (4500k, 7000K)
Vietnam		N/A	N/A		TCVN 8249:2009		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
					Tubular Fluorescent Lamps. Energy efficiency		

Incandescent Lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 4934.1 (Int) - 2008	AS/NZS 4934.2 (Int) -2008: Incandescent lamps for general lighting services - Minimum energy performance standard requirements	n/a	certain general purpose incandescent lamps (tungsten filament and tungsten halogen)	n/a		MEPS for incandescent lamps are set out as minimum Efficacy, The required minimum initial lamp efficacy (in lm/W) is given by the formula: 2.8 x ln(L) - 4.0 where ln(L) is the natural logarithm of the measured initial luminous flux (in lumens)
Canada	CAN/CSA-C862-01 (ANSI C78.21 Table 1 of Part II for lamp class)	MEPS for General Service Incandescent Reflector Lamps, ER and BR Lamps	EnerGuide	Incandescent reflector lamps: with an R bulb shape, a PAR bulb shape or a bulb shape similar to R or PAR that is neither ER nor BR, as described in ANSI C79.1; with an E26/24 single contact or E26/50 × 39 skirted, medium screw base; with a nominal voltage or voltage range that lies at least partially between 100 volts and 130 volts; with a diameter greater than 70 mm (2.75 inches) that has a nominal power of not less than 40 W and not more than 205 W BR lamps: As described in ANSI C79.1, but does not include any of those lamps that have a diameter of 95.25 mm (BR30) and a nominal power of less than 66 W, or a diameter of 92.5 mm (BR30) and a	N/a		Minimum average lamp efficacy by rated power of different lamps accordingly.

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				nominal power of 85 W, or a diameter of not less than 120.65 mm (BR38) but not more than 127 mm (BR40) and a nominal power of less than 121 W . ER lamps: As described in ANSI C79.1			
Chile	NCh3010.Of 2006 IEC 60064 (2005)	None	Energy Efficiency - Incandescent Tungsten Filament - Classification and Labeling	incandescent tungsten filament lamps for domestic and general, which have a rated power between 25w and 200w, inclusive, a nominal voltage between 100v and 250v, blisters form A or PS, or frosted clear blisters, or white finish; caps B22D, E26 or E27, according to the scope and field of application of IEC 60064 / 2005.	None		
Korea	KS C 7501	MEPS for Incandescent Lamp	Energy Efficiency Label for Incandescent Lamp		N/A		
Chinese Taipei	CNS 3891, CNS 11006, CNS5513	MEPS for Incandescent Lamps	N/A		N/A		
The Philippines	N/A	PNS 2050-6:2010 - Lamps and related equipment - Energy labeling requirements - Part 6: Incandescent lamps for domestic and similar general lighting purposes	N/A		N/A		
The United States	10 CFR part 430, subpart B	10 CFR Part 430 Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps; Final Rule	Energy Guide	INCANDESCENT REFLECTOR LAMPS(40W-205W, Standard Spectrum, and Modified Spectrum)40W-205W, Standard Spectrum, and Modified Spectrum	N/A		

HID Lamps

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
China	GB 20054-2006	GB 20054-2006 - The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for metal- halide lamps	n/a	Single-capped metal-halide lamps with transparent glass cover, rated power 175W to 1500W	China Energy Conservation Certification for metal- halide lamps	Same scope with MEPS	Minimum initial efficacy by rated power (175, 200, 400, 1000, 1500W)
	GB 19573-2004; GB/T 13434	GB 19573-2004 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for high-pressure sodium vapour lamps	China Energy Label for high-pressure sodium vapor lamps	Including the high-pressure sodium lamps with transparent glass cover, for the indoor and outdoor lighting, which the power range from 50W -1,0 00W, equipped with the appropriate ballast and trigger	China Energy Conservation Certification for high-pressure sodium vapor lamps	Same scope with MEPS	Minimum initial efficacy and Energy Efficiency Grades by rated power (50, 70, 100, 150, 250, 400, 1000W)
Korea					High-Efficiency Appliance Certification Programs for Metal-halide Lamps		
Mexico	NMX-J-530-ANCE; IES LM-51	None	None		Sello FIDE for HID Lamps	Applicable to sodium vapor lamps High Pressure and metal halide pulse-start, for power from 70W to 600W bulb with clear finish, and caps E26, E27, E39 or E40.	Minimum Efficiency (lm/W) criteria set based on rated lamp power and lamp category (high pressure sodium vapor or metal halide)
The Philippines	PNS IEC 61167:2006; PNS IEC 60188:2006; PNS IEC 60192:2006; PNS IEC 60357:2006;	N/A	PNS 2050-3:2007 Lamps and related equipment - Energy efficiency and labeling requirements - Part 3: High intensity discharge		N/A		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	PNS IEC 60662:2006; PNS IEC 62035:2006;		(HID) lamps				
The United States	Under development	10 CFR Part 431: Energy Conservation Program for Consumer Products and Certain Commercial and Industrial Equipment: Final Determination Concerning the Potential for Energy Conservation Standards for High-Intensity Discharge (HID) Lamps-effective January 1st, 2015.	EnergyGuide	HID lamps are electric-discharge lamps in which: The light-producing arc is stabilized by the arc tube wall temperature; and The arc tube wall loading is in excess of 3 watts (W)/centimeters squared (cm2), including such lamps that are mercury vapor, metal halide, and high-pressure sodium lamps.	NA		
Vietnam		N/A	N/A		TCVN 8250:2009 High-pressure Sodium Vapor Lamps. Energy efficiency		

Solid State Lighting

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Korea		N/A	N/A		High-Efficiency Appliance Certification Programs for LED Traffic Lights	LED Traffic Lights	
		N/A	N/A		High-Efficiency Appliance Certification Programs for LED Lamps (internal & external converter)	LED Lamps (internal & external converter)	
Malaysia	MS IEC 60969:2006	N/A	N/A		Energy efficiency rating and labeling for electric lamps	Fluorescent lamps and LED lamps	
Mexico	NMX-J-198-ANCE; IES-LM 31	None	None		Sello FIDE for LED	Applies to fixtures for	

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
					fixtures for roads and pedestrian areas	main roads, main roads, or collector primary, secondary and pedestrian areas, with the LED module, holistically or modules with LED fixtures to be adapted to the roads. The power supply of the LED's, may have a nominal operating voltage of 120, 127, 220, 240, 254, 277 or 440 volts at a frequency of 60 Hertz.	Minimum Initial Average Illuminance Level (lx) and Maximum Uniformity of Illuminance Eprom / Emin (ADIM) based on rated lamp power
					Sello FIDE for LED fixtures for street lighting powered by PV systems	applicable to luminaires with LEDs for street lighting powered photovoltaic systems are used on main roads, main roads, or collector primary, secondary, emergency lighting, weather exposed areas where objects are illuminated facades, parks, gardens, petonales areas, outdoor sports areas, etc.	
The United States	LED Fixture: for LED ANSI C78.377-2008;ANSI C79.1–2002;ANSI C78.20 – 2003; ANSI C78.21 – 2003; ANSI C78.21 – 2003; ANSI/IEC C81.61-2003; ANSI/IEEE C62.41 – 1991 (01-May-1991); CIE Publication No. 13.3 – 1995; CIE Publication No.	N/A	N/A		ENERGY STAR for Solid State Lighting Luminaires	SSL products used for general illumination, including those with significant decorative function. The criteria apply to both residential and commercial products.	Criteria item includes Correlated color temperature (CCT), luminary efficacy, zonal lumen density, and minimum light output and Lumen maintenance, CRI, power factor.

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	18.2 – 1983; IESNA LM-16						
	IESNA LM-79-08 IESNA LM-80-08 CIE Publication No. 13.3 – 1995 ANSI/IEEE C62.41 (01-May-1991 FCC 47 CFR including Part 2 and Part 18	N/A	N/A	N/A	ENERGY STAR Integral LED Lamps	integral LED lamps2, defined as a lamp with LEDs, an integrated LED driver, and an ANSI standardized base designed to connect to the branch circuit via an ANSI Standardized lamp holder/socket.	The performance level varies by lamp types and nominal wattages.

Ballasts

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 4783.1:2001 (IEC60921, IEC 60929)	AS/NZS 4783.2:2002 MEPS Requirements for Ballasts for Linear Fluorescent Lamps	n/a	Apply to the following types of ballasts: •ferromagnetic and electronic ballasts used with linear fluorescent lamps from 15W to 70W; •rated for 50 Hz and 230/240/250V supply (or a range that includes these); •ballasts supplied as separate components or as part of a luminary.	n/a		(MEPS) requirements are set out as maximum allowable total circuit power, categorized by nominal lamp power watt
Canada	CAN/CSA-C654-M91(amended 2001)	MEPS for Fluorescent Lamp Ballasts	n/a	fluorescent lamp ballasts (a) used to start and operate fluorescent lamps by providing a starting voltage and current, limiting the current during normal operation, and where necessary to facilitate lamp operation, providing cathode heating (b) designed for input of 120, 277 or 347 volts, and (c) designed to operate with an F32T8,	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps		The ENERGY STAR Residential Light Fixture specification covers the requirements for indoor and outdoor light fixtures, recessed downlight retrofit kits and replacement GU-24 base integrated lamps intended primarily for residential type applications.

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				F34T12, F40T10 or F40T12 rapid-start fluorescent lamp or an F96T12IS, F96T12ES, F96T12HO or F96T12HO ES fluorescent lamp but does not include a ballast: (d) designed to be used in an outdoor sign and that is capable of operating with an F96T12HO fluorescent lamp in ambient temperatures at or below -28.9 oC, or (e) that, by means of an integrated dimming capability, can reduce the output of the fluorescent lamp by 50% or more			For the purposes of this ENERGY STAR specification, residential applications include single-family and multi-family dwellings (such as houses and apartments), dormitories, public or military housing, assisted-living facilities, motels and hotels, and some light commercial applications. Exclusion of magnetic ballasts. Inclusion of decorative LEDs.
China	GB17896-1999; GB/T15144-1994	GB17896-1999 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for tubular fluorescent lamps ballast	n/a	Electronic ad Magnetic ballast.	China Energy Conservation Certification for tubular fluorescent lamps ballast		BEF criteria is set by nominal power, and ballast type(electronic and Magnetic)
	GB 19574-2004; IEC60925; GB/T 13434	GB 19574-2004 The Minimum Allowable Values of Energy Efficiency and evaluating values of energy conservation for ballast for high-pressure sodium lamp	n/a		China Energy Conservation Certification for ballast for high-pressure sodium lamp		BEF criteria is set by nominal power
	GB 20053-2006	GB 20053-2006 The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for ballast of metal- halide lamps	n/a		China Energy Conservation Certification for ballast for metal- halide lamps		BEF criteria is set by nominal power
Hong Kong, China	EN 50294	none	none		Voluntary Energy Efficiency Labeling Scheme for Electronic		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
					Ballasts		
Korea	KS C 8102	MEPS for Fluorescent Lamps Ballast	Energy Efficiency Label for Fluorescent Lamps Ballast		High-Efficiency Appliance Certification Programs for Ballasts (including Ballasts for 26mm 32W fluorescent lamps, Ballasts for 16mm fluorescent lamps, Ballasts for FPL 32W compact fluorescent lamps, Electronic ballasts for metal halide lamps, Electronic b		
	KS C 7621	MEPS for Associated Ballast	Energy Efficiency Label for Associated Ballast				
Malaysia	MS 1778: Part 1:2005 Voluntary Label: MS 141: Part 2 :1993 & MS IEC 929 :1995	MS 1778: PART 2:2005 Electrical lighting equipment - Ballasts for fluorescent lamps - Part 2: Energy Labeling and minimum energy performance standard requirements	n/a	The classification of ballasts for a range of fluorescent lamp types according to their Energy Efficiency Index (EEI) and the form of Labeling of the EEI, which is generally shown on the ballast rating plate.	Energy efficiency rating and labeling for ballasts for fluorescent lamps		This Malaysian Standard specifies the requirements for the classification of ballasts for a range of fluorescent lamp types according to their Energy Efficiency Index (EEI) and the form of Labeling of the EEI, which is generally shown on the ballast.
Mexico	NMX-J-295-ANCE; NMX-J-513; NMX-J-198-ANCE	n/a	n/a		Sello FIDE for CFL, T5, T8, HID ballasts		Maximum Power (W) based on lamp type
New Zealand	AS/NZS 4783.1:2001: Performance of electrical lighting equipment—Ballasts for fluorescent lamps—Method of	AS/NZS 4783.2:2002: Performance of electrical lighting equipment—Ballasts for fluorescent lamps—Energy Labeling and minimum energy performance standards	n/a		n/a		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	measurement to determine energy consumption and performance of ballasts lamp circuits	requirements					
Chinese Taipei	CNS13755	MEPS for Fluorescent Lamp Ballasts	N/A		N/A		
Thailand	TIS 885-2532, TIS 1506-2542; TIS 1506-2541				Energy Efficient Ballast Program - Electronic Ballasts		
	TIS23-2521				Energy Efficient Ballast Program - Magnetic Ballasts For Fluorescent Lamps		
The Philippines	PNS IEC 60929:2006; PNS IEC 60921:2006	N/a	PNS 2050-4:2007 Lamps and related equipment - Energy labeling requirements - part 4: Ballast		Efficient Lighting Initiative Program - Ballast for double-capped fluorescent lamps		
Vietnam	TCVN7541-2:2005;TCVN 7590-2-8:2006(IEC 61347-2-8:2006); TCVN 6479:2006(IEC 60921:2004)	N/A	N/A		TCVN 8248:2009 Electromagnetic Ballasts for Fluorescent Lamps. Energy efficiency		
	TCVN 7541-2:2005; TCVN 7673:2007(IEC 60969:2001); TCVN7863:2008(IEC 60901:2004)	N/A	N/A		TCVN 7897:2008 Electronic ballasts for fluorescent lamps. Energy efficiency		

Other Lighting Products

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Canada	IESNA LM45 for lamp lumen output and wattage; IESNA LM49 for lamp life; CIE 13.3 for lamp Color Rendering Index (CRI)	MEPS for General Service Lamps(January 1, 2012 and December 31, 2012 for minimum performance)	EnerGuide				Lamp Efficacy Life Color Rendering Index (CRI) , categorized by luminous flux
	CSA C22.2 No. 12 Voluntary Label: US ENERGY STAR Test Methods	MEPS for Trochees	None	Portable electric luminary that has a reflector bowl or similar-shaped reflector that directs light in a predominantly upward direction for the purpose of providing indirect lighting and that may be equipped with one or more additional sockets intended for other lighting functions	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps		with no additional socket: total electrical power ≤75W With one or more additional socket: total electrical power ≤100 W
	CSA C22.2 No. 9 Voluntary Label: US ENERGY STAR Test Methods	MEPS for Ceiling Fan Lighting	None	Ceiling fan: a household ceiling fan. Ceiling fan light kit: equipment that is designed to be attached to a ceiling fan for the purpose of providing light.	ENERGY STAR for Residential Light Fixtures and Replacement GU-24 Base Integrated Lamps		
Chile					Replacement GU-24 Base Integrated Lamps		
Korea					High-Efficiency Appliance Certification Programs for Reflectors for fluorescent lamps and HID lamps		
					High-Efficiency Appliance Certification Programs for Sensor lighting equipment		
Mexico	NOM-013-ENER-2004	Energy efficiency for lighting systems in public roadways and outdoor areas	None	all new systems lighting for roads, public parking lots open, closed or roofs and outdoor areas public, as extensions of existing plants to be built in the economy, regardless of their size	Sello FIDE for indoor luminaires, outdoor lighting fixtures, induction lamps, HID lamp dimmers,		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				and load. Applications of facilities covered under this Mexican Official Standard include: a) Roadways b) Public parking lots open, closed or roofed c) Public outdoor areas	occupancy sensors, industrial use lighting		
	NOM-007-ENER-2004	Energy efficiency for lighting systems in non-residential buildings	None	The scope of this Mexican Official Standard includes interior lighting systems and outside of new residential buildings are not wired for lighting total load greater than or = 3 kW, as well as additions and modifications to the interior lighting systems outdoor lighting connected load greater than or equal to 3 kW of existing buildings			
Chinese Taipei					Energy Label Program for Indoor Light Fixtures		
					Energy Label Program for Exit Lights and Emergency Direction Lights		
The Philippines	PNS IEC 60598-1:2006;	N/A	PNS 2050-5:2007 - Lamps and related equipment - Energy labeling requirements - Part 5: Luminaires				
The United States					ENERGY STAR for Residential Light Fixtures	indoor and outdoor light fixtures, recessed downlight retrofit kits	
	Appendix AA to Subpart B of Part 430,	EPACT 2005. 10 CFR Parts 430 Energy Conservation	EnergyGuide		NA		Minimum efficacy based on rated power and lamp type

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
		Standards for Certain Consumer Products and Commercial and Industrial Equipment (Torchiere Lighting Fixtures)					
	Appendix U to Subpart B of Part 430	10 CFR Parts 430 Energy Conservation Standards for Certain Consumer Products and Commercial and Industrial Equipment 10 CFR Part 430 Energy Conservation Standards for Certain Ceiling Fan Light Kits	EnergyGuide		EPA's ENERGY STAR Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans.	Ceiling Fans	ENERGY STAR: Specification defines residential ceiling fan airflow efficiency on a performance basis: CFM* of airflow per watt of power consumed by the motor and controls. Efficiency is measured on each of 3 speeds. At low speed, fans must have a minimum airflow of 1,250 CFM* and an efficiency of 155 CFM/Watt Qualifying ceiling fan models must come with a minimum 30-year motor warranty; one-year component(s) warranty; and 2-year light kits warranty. At high speed, fans must have a minimum airflow of 5,000 CFM* and an efficiency of 75 CFM/Watt Integral or attachable lighting, including separately sold ceiling fan light kits, must meet certain requirements of the RLF specification. See QPI form for specific requirements

Computers and Monitors

Computers

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use
Australia	US EPA Energy Star tests	Under development	None		ENERGY STAR - Computers	Computers (Desktop PC)	
Canada	US EPA tests	None	None		ENERGY STAR - Computer	* Desktop Computers * Integrated Desktop Computers * Notebook Computers * Workstations * Game Consoles * Small-Scale Servers * Thin Clients	On, sleep and off Mode
China	CQC3114-2009	under development	None		China Energy Conservation Certification for computers		
Hong Kong, China		None	None		Voluntary Energy Efficiency Labeling Scheme for Computers		Sleep mode
Indonesia		under development	None		None		
Japan	public notice	Top Runner for Computers	Label Display Program	Digital central processing units (CPUs) and personal computers (PCs) stipulated by the Japan Standard Commodity Classification, except the following: 1) ones whose processing units, main memory units, input/output controllers and power supplies are structurally multiplexed, 2) ones whose theoretical operation＊ is 50,000 MTOPS or more, 3) ones capable of computation using a processing unit composed of over 256 processors, 4) ones with 512 or more input/output signal transmission channels (limited to those whose maximum data transfer rate is 100 megabit or more per second), 5) ones whose theoretical operation is less than 100 MTOPS, 6) ones mainly used	ENERGY STAR - computers	Digital central processing units (CPUs) and personal computers (PCs) stipulated by the Japan Standard Commodity Classification, except the following: 1) ones whose processing units, main memory units, input/output controllers and power supplies are structurally multiplexed, 2) ones whose theoretical operation＊ is 50,000 MTOPS or more, 3) ones capable of computation using a processing unit composed of over 256 processors, 4) ones with 512 or more input/output signal transmission channels (limited to those whose maximum data transfer rate is 100 megabit or more per second), 5) ones whose theoretical operation is less than 100 MTOPS, 6) ones mainly used with built-in power supply instead of being connected to	

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use
				with built-in power supply instead of being connected to power line and having built-in magnetic disk units.		power line and having built-in magnetic disk units.	
Korea	KS C IEC 62301	N/A	E-Standby Power Program for Computers (Warning Label)		E-Standby Power Program for Computers (High Standby Power Reduction Potentials)	Computers with nameplate output power of power supply less than equal to 1,000W - Covers mainly computers sold commercially or for household use in the market, including personal computers, notebook computers, and including integrated computer systems. Computers for network servers, workstations and computers in standby mode awaiting instructions remotely are excluded	Maximum continuous output power rating; low-power mode
Mexico			Under development				
New Zealand	US EPA tests				ENERGY STAR - computers	ENERGY STAR Version 5.0 definition	Off Mode, Sleep Mode, Idle State, Active State
Thailand	IEC 62301	Under development	None		None		
The Philippines		Under development	None		None		
The United States	US EPA tests	None	None		ENERGY STAR- Computer	A device which performs logical operations and processes data. Computers are composed of, at a minimum: (1) a central processing unit (CPU) to perform operations; (2) user input devices such as a keyboard, mouse, digitizer or game controller; and (3) a computer display screen to output information. For the purposes of this specification, computers include both stationary and portable units, including desktop computers, gaming consoles, integrated desktop computers, notebook computers, small-scale servers, thin clients, and workstations. Although computers must be capable of using input devices and computer displays, as noted in numbers 2 and 3 above, computer systems do not need to include these devices on shipment to meet	Off Mode, Sleep Mode, Idle State, Active State

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use
						this definition.	

Monitors

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use
Australia	US EPA Energy Star tests	Under development	Under development		ENERGY STAR - Monitors	A cathode-ray tube (CRT), flat panel display (e.g., a liquid crystal display) or other display device and its associated electronics. A monitor may be sold separately or integrated into the computer chassis. This definition is intended primarily to cover standard monitors designed for use with personal computers. The following may also be considered a monitor: mainframe terminals, and physically separate display units.	First low-power sleep mode < 15 w; Second low-power deep sleep mode < 8 w
China	GB 21520-2008	Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Computer Monitors	China Energy Label - Computer Monitors	cathode ray tube display device (referred to as CRT display) and LCD display device on computers that function properly under grid voltage, as well as computer monitors with a tuner / receiver display equipment	China Energy Conservation Certification for computer monitors		Off Mode
Hong Kong, China		None	None		Voluntary Energy Efficiency Labeling Scheme for LCD Monitors	Any LCD monitors that are marketed to the consumer as such and meet the definition in Section 3.5 are eligible for the application of EELS for LCD monitors. This scheme does not cover products with computer capability that are marketed and sold as televisions.	On mode/active power; Sleep and off mode
Indonesia		Under development	None		None		
Japan	US EPA tests	None	None		ENERGY STAR for Monitors		
Korea	KS C IEC 62301	N/A	E-Standby Power Program for Monitors (Warning Label)		E-Standby Power Program for Monitors (High Standby Power Reduction Potentials)	Commercially-available, electronic product with a display screen and its associated electronics encased in a single housing that is capable of displaying output information from a computer via one or more inputs, such as VGA and DVI with nameplate output power of power supply less than equal to 1,000W - Includes computer monitors (i.e., focusing on computer monitor	Low-power Sleep Mode d4.0W; Off Mode d2.0W

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use
						as the primary function) or as dual function computer monitors and televisions	
Mexico	NMX-I-163-NYCE	None	None		Sello FIDE for personal computer monitors	applicable to models of monitors for personal computers, powered with a rated voltage of 100 to 240 volts at a frequency of 60 Hz in any of the following types of picture tubes construction: - Screen Cathode Ray Tube (Cathode Ray Tube CRT) - With Liquid Crystal Display (Liquid Crystal Display "LCD ") - Plasma Screen - With any other similar system Flat Screen	Active Maximum Power Input and Maximum Delay Time For Home Energy Saver Mode
New Zealand	US EPA tests	None	None		ENERGY STAR program for Displays	A commercially-available product with a display screen and associated electronics, often encased in a single housing, that as its primary function displays visual information from (i) a computer, workstation or server via one or more inputs, such as VGA, DVI, HDMI, or IEEE 1394, or (ii) a USB flash drive, a memory card, or wireless Internet connection. Common display technologies include liquid crystal display (LCD), light emitting diode (LED), cathode-ray tube (CRT), and plasma display panel (PDP).	On mode; Sleep and off mode
Chinese Taipei	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	None	None		Energy Label Program for Monitors	monitors/displays	
Thailand	IEC 62301	Under development	None		Energy Efficiency Label (pilot)		
The United States	10 CFR Part 430 Subpart B App H , US ENERGY STAR	None	None		ENERGY STAR - Displays (Versions 4.1 and 5.1 specifications have been finalized. Effective date for 4.1 is May 1, 2010, for 5.1 is May 1, 2012)	Covers computer monitors, digital picture frames, and professional signage, collectively referred to as 'displays' under this specification.	

Televisions

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
Australia	AS/NZS 62087.1:2010	AS/NZS 62087.2:2010 : Power consumption of audio, video and related equipment, Part 2.2: Minimum energy performance standards (MEPS) and energy rating label requirements for television sets	Energy Labeling for Televisions	All televisions excluding the following: Television sets powered from batteries. Display devices that do not have a television tuner. Front or rear projection display devices and televisions.	None	A commercially available electronic product consisting of a tuner/receiver and a monitor encased in a single housing. The monitor usually relies upon a cathode-ray tube (CRT), liquid crystal display (LCD), plasma display, or other display device. The TV is designed to receive and display a television signal broadcast by antenna, satellite, or cable. To qualify, the TV must be capable of being powered from either a wall outlet or a battery unit that is sold with an AC adapter. For purposes of this agreement, this definition includes analog and digital televisions in addition to televisions that require additional power to receive and process signals that contain information and/or data for electronic programming guides. Television products with a tuner/receiver and computer capability (e.g., computer input port) may qualify as ENERGY STAR under this specification as long as they are marketed and sold to consumers as televisions (i.e., focusing on television as the primary function). However, products with a tuner/receiver and computer capability that are marketed and sold as 1) computer monitors or 2) dual function televisions and computer monitors	MEPS: Tier 1 MEPS = 127.75 + (0.1825 × screen area) where screen area is in cm2 and MEPS level is in kWh/year. Tier 2 MEPS = 90.1 + (0.1168 × screen area) Energy labeling: Star rating index (calculated value from Base Energy Consumption, comparative energy consumption and energy reduction factor

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						are not included in this specification.	
Canada	CAN/CSA-C6230 1-07(Harmonized with IEC- 62301)	MEPS for Standby Power Consumption	Under development	(1) Compact Audio Products, (2) Televisions, and (3) Video Playing/Recording Products.	ENERGY STAR Label, 4.1 and 5.1	Any TV, TV Combination Unit, or Component Television Unit that is marketed to the consumer as such (i.e., focusing on television as the primary function), which meets the respective product type definition in Section 1, and is capable of being powered from either a wall outlet or a battery unit that is sold with an external power supply is eligible to earn the ENERGY STAR. This specification does not cover monitors with computer capability (e.g., a computer input port, such as VGA) that are marketed and sold as 1) computer monitors or 2) dual function television and computer monitors. TVs that do not have a power state meeting the definition of Sleep Mode (e.g., Public Alert CEA2009A certified models which offer 24/7/365 active features to alert users) are not able to qualify for ENERGY STAR.	MEPS: Standby Power

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
China	GB12021.7-2005, GB/T 17309.1 (idt IEC 107-1 1995)	GB 12021.7-2005 - Limited values of energy efficiency and evaluating values of energy conservation (HEPS) for color television broadcasting receivers	n/a	The passive standby power applies to colored televisions sold in China The Energy Efficiency Index applies to cathode-ray tube televisions. Other kinds of color television can adopted as reference.	Energy conservation certification for color television broadcasting receivers	CRT color receivers and CRT rear projection receivers	
	GB 24850-2010	GB 24850-2010: Minimum allowable values of energy efficiency and energy efficiency grades for flat panel televisions	China Energy Label - Flat Panel Televisions	This standard applies to liquid crystal display (LCD) and plasma televisions for general use in normal operation under grid voltage, and liquid crystal display (LCD) or plasma display without tuners with main function as television as well. Other types of flat panel display can follow suit.	Energy conservation certification rules for Flat Panel Televisions	This standard applies to liquid crystal display (LCD) and plasma televisions for general use in normal operation under grid voltage, and liquid crystal display (LCD) or plasma display without tuners with main function as television, and other types of flat panel display.	Energy Efficiency Index (it is a calculation value from screen luminance, effective lighting size of screen, on-mode power and signal processing power.) Power under passive idle mode(≤1.0; after Jan 1, 2012 ≤0.50)
Hong Kong, China		n/a	n/a		The Hong Kong Voluntary Energy Efficiency Labeling Scheme for TVs	The scope of application covers all new registered appliances imported to or manufactured in Hong Kong with effect from the date that is declared by the participants but does not cover second-hand products, products already in existing use, under trans-shipment or manufactured for export, etc. Televisions under this Labeling scheme include analog and digital televisions, television monitors, TV/VCR (Videocassette Player) combination units, TV/DVD combination units, TV/VCR/DVD combination units and component television units. 3.6 Television products with computer connection capability (e.g., computer input	Standby power≤1.0W

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
						port) may qualify under this scheme as long as they are marketed and sold to consumers as televisions (i.e., focusing on television as the primary function). However, products with computer connection capability that are marketed and sold as (i) computer monitors or (ii) dual function televisions and computer monitors are not included in this scheme.	
Indonesia	IEC 60107-1; JIS C 6101-1	under development	n/a		Energy Efficiency Labeling for TV	CRT LCD/Plasma TV	
Japan	Public notice; JIS C 6101-1	Top Runner Program for TV	Label Display Program	Cathode ray tube TV sets, liquid crystal display TV sets, or plasma TV sets that run on alternating current, except the following: 1) ones for industrial use, 2) multiscan-compatible cathode ray tube (CRT) type ones of over 33.8 kHz in horizontal frequency, 3) ones for travelers from overseas, 4) rear projection type ones, 5) 10 type, 10 V type or smaller ones in TV receiver size, 6) wireless type ones, and 7) computer display units having TV Broadcast receiving function.	Energy Saving Labeling Program	Cathode ray tube TV sets, liquid crystal display TV sets, or plasma TV sets that run on alternating current, except the following: 1) ones for industrial use, 2) multiscan-compatible cathode ray tube (CRT) type ones of over 33.8 kHz in horizontal frequency, 3) ones for travelers from overseas, 4) rear projection type ones, 5) 10 type, 10 V type or smaller ones in TV receiver size, 6) wireless type ones, and 7) computer display units having TV broadcast receiving function.	Standard Energy Consumption per year=F(screen size)
Korea	KS C IEC 62301	n/a	E-Standby Power Program for Televisions (Warning Label)	An electronic product with nameplate output power of power supply less than equal to 1,000W, consisting of a tuner/receiver and a monitor encased in a single housing - The monitor usually relies upon a cathode-ray tube (CRT), liquid crystal display (LCD), plasma display, or other display device and designed to receive and display a	E-Standby Power Program for Televisions (High Standby Power Reduction Potentials)	An electronic product with nameplate output power of power supply less than equal to 1,000W, consisting of a tuner/receiver and a monitor encased in a single housing - The monitor usually relies upon a cathode-ray tube (CRT), liquid crystal display (LCD), plasma display, or other display device and designed to receive and display a	Voluntary label: passive standby mode<=1.0W

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
				television signal broadcast by antenna, satellite, or cable - Television products with computer capability are included as long as they are marketed and sold to consumers as televisions (focusing on television as the primary function) - Also includes television monitors, component television units, TV/VCR combination units, TV/DVD combination units, TV/VCR/DVD combination units - Excludes OCAP, IP and other television receivers internalized with special functions.		television signal broadcast by antenna, satellite, or cable - Television products with computer capability are included as long as they are marketed and sold to consumers as televisions (focusing on television as the primary function) - Also includes television monitors, component television units, TV/VCR combination units, TV/DVD combination units, TV/VCR/DVD combination units - Excludes OCAP, IP and other television receivers internalized with special functions.	
Malaysia	IEC 62087 Edition 2.0: 2008-10 for on mode power and MS IEC 62301:2006 for standby mode power	n/a	n/a		Energy efficiency rating and labeling for televisions		On mode; standby mode
Mexico	NMX-I-122-NYCE; IEC 62087		Under development		Sello FIDE for TV receivers	Applicable to models of TV receivers with images in color or Black and White, stable or programmable, analog or digital, fed with a rated voltage of 110 V or 115 V or 127 V or 220 V or 230 Volts At a frequency of 60 Hz in any of the following types of picture tubes construction: - Screen Cathode Ray Tube (Cathode Ray Tube CRT) - With Liquid Crystal Display (Liquid Crystal Display "LCD ") - Plasma Screen - With any other similar system Flat Screen	Maximum electrical power input in standby mode: 1 Watt
New Zealand	ENERGY STAR	None	None		ENERGY	Any TV, TV Combination Unit, or	On mode; Download

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
	Test Method				STAR® program requirements for Televisions Versions 4.1 and 5.1	Component Television Unit that is marketed to the consumer as such (i.e., focusing on television as the primary function), which meets the respective product type definition in Section 1, and is capable of being powered from either a wall outlet or a battery unit that is sold with an external power supply is eligible to earn the ENERGY STAR. This specification does not cover monitors with computer capability (e.g., a computer input port, such as VGA) that are marketed and sold as 1) computer monitors or 2) dual function television and computer monitors. TVs that do not have a power state meeting the definition of Sleep Mode (e.g., Public Alert CEA2009A certified models which offer 24/7/365 active features to alert users) are not able to qualify for ENERGY STAR.	Acquisition Mode; Sleep Mode Power; and TEC limited for hospitality TVs. e.g. Plax = 0.190 * A + 5 (A< 275 square inches) Maximum Allowable Energy in DAM :0.08 No more than one (1.0) watt while in Sleep Mode.
Russia		Under development	n/a		n/a		
Chinese Taipei	ENERGY STAR Program; IEC 62087 (On Mode); IEC 62301 (Standby Mode)	n/a	n/a		Energy Efficiency Criteria and Labeling Method for Energy Label Qualified Televisions	The product shall meet the requirements of CNS 14408, or recognized by the Bureau of Energy of MOEA as televisions.	Power Consumption Mode Maximum Power Consumption (W) : On Mode 0.028×A +12.8 Standby Mode 1.0 A: Viewable screen area (cm2)
Thailand	IEC 62301	Under development	None		Standby Power Program for Televisions		
The Philippines		Under development	None		None		

Economy	Test Method/Standard	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	Mode of Energy Use and/or Level of Energy Efficiency
The United States	10 CFR Part 430 Subpart B App H , US ENERGY STAR	None	EnergyGuide Labels on TVs to Better Inform Consumers		ENERGY STAR - Television, Current Specification Effective Date: Version 4.1 - May 1, 2010 ; Version 5.1 - May 1, 2012	Any TV, TV Combination Unit, or Component Television Unit that is marketed to the consumer as such (i.e., focusing on television as the primary function), which meets the respective product type definition in Section 1, and is capable of being powered from either a wall outlet or a battery unit that is sold with an external power supply is eligible to earn the ENERGY STAR. This specification does not cover monitors with computer capability (e.g., a computer input port, such as VGA) that are marketed and sold as 1) computer monitors or 2) dual function television and computer monitors. TVs that do not have a power state meeting the definition of Sleep Mode (e.g., Public Alert CEA2009A certified models which offer 24/7/365 active features to alert users) are not able to qualify for ENERGY STAR. Mode: 1) On Mode, 2) Sleep and Off Mode	On mode; Download Acquisition Mode; Sleep Mode Power; and TEC limited for hospitality TVs. e.g. Plax = 0.190 * A + 5 (A< 275 square inches) Maximum Allowable Energy in DAM :0.08 No more than one (1.0) watt while in Sleep Mode.

Clothes Washers and Dryers

Clothes Washers

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
Australia	AS/NZS 2040.1:2005/Amdt1:2007	N/A	Energy Labeling for Clothes Washers	Products are classified into either drum type (generally front loading) or non drum type (all other types e.g. top loaders with impellers or agitators, twin tub machines).	N/A		
Canada	CAN/CSA-C360-03	MEPS for clothes washers (Voluntary on household-style commercial clothes washers)	EnerGuide Label	Standard or compact electrically-operated clothes washer that does not require mechanical fastening to a floor or wall, is top or front-loaded and has an internal control system that regulates the water temperature without the need for user intervention after the initiation of machine operation.	ENERGY STAR	A standard-capacity clothes washer with a tub capacity of 45L (1.6 ft^3) or greater. Commercial clothes washers are built on a residential clothes washer frame with certain modifications to improve their durability. These coin/or card operated, soft-mount front-loading and top loading clothes washers with a tub not greater than 99.3L (3.54 ft^3) for front-loading washers or not greater than 113L (4 ft^3) for top-loading washers, designated for use in applications where the occupants of more than one household will be using it.	Determined by energy factors (EF) across 3 product classes
China	GB12021.4-2004	Minimum allowable values of the energy efficiency and energy efficiency grade for household electric washing machines	China Energy Label - Clothes Washers (Electric)	Domestic electric washing machine with a rated washing capacity ≤13kg. Not applicable to those with a rated washing capacity ≤1.0kg or single-drum washing machines without dehydration function.	China Energy Conservation Certification for household electric washing machines	Domestic electric washing machine with a rated washing capacity ≤13kg. Not applicable to those with a rated washing capacity ≤1.0kg or single-drum washing machines without dehydration function.	(More stringent criteria in 2011)
Hong Kong, China	IEC 60456; JIS C 9606	None	Mandatory Energy Efficiency Labeling Scheme (MEELS) for Washing Machines (To be effective in 2011)	(a) a household appliance for cleaning and rinsing of textiles using water with or without a means of extracting excess water from the textiles; and (b) includes washing machines that (i) use mains electricity as the primary power source; and (ii) have a rated washing capacity not exceeding 7 kilograms, whether or not they have built-in dryers for drying textiles by means of heating.	Voluntary Energy Efficiency Scheme for Washing Machine	All electrically operated clothes washing machines that have washing capacity normally not exceeding 10 kg for household use. Appliances that have large capacity or for industrial use or those using non-electric energy sources, or have no spin extraction capability are excluded. This scheme applies to top-loading agitator/impeller -type and top-loading/front-loading drum-type clothes washing machines.	2 product classes and 5 EE grades, measured by Energy Consumption Index (energy consumption per cycle / rated washing capacity)
Indonesia	SNI IEC 60456-1-2009	MEPS for clothes washers	N/A		None		
Korea	KS C 9608; JIS C	MEPS for Washing	Energy	By KS C 9608 washing machine in	None		5 grades given by

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
	9606	machine (Agitator & Impeller)	efficiency labeling for washing machine (Agitator & Impeller)	which the textiles are substantially immersed in the washing water, the mechanical action being produced by a device moving, which are defined the agitator washing machine and impeller washing machine with the rated capacity of 2 kg ~ 15kg. But, washing only and spin extraction only are excluded.			ratings of One-time washing consumption electric power amount [Wh] / Standard washing capacity [kg]
	KS C IEC 60456 & KS C 9608	MEPS for Horizontal drum washing machine	Energy efficiency labeling for horizontal drum washing machine	Horizontal drum washing machine which is defined the household washing machine with the rated capacity of 2 kg ~ 15kg 13kg or less, and has the heater, spin extractor, and dryer. But, non-detergent type is excluded, and the type with the heater is only available to boil or to dry is also excluded.	None		6 grades given by ratings of One-time washing consumption electric power amount [Wh] / Standard washing capacity [kg]
Malaysia	MS IEC 60335-1:2003 MS IEC 60335-2-4:2003 MS 1597: Part 2-7:2003 MS 1597:Part 2-43:2005 MS IEC 60335-2-11:2003		None	Electric washing machine; electric cloth dryers; tumbler dryers	None		
Mexico	NOM-005-ENER-2010	Energy efficiency of household electric washing machines	Energy Efficiency Label	Household electric washing machine, classified into the following types: 1) Automatic Washing Machine vertical axis with volumetric capacity of the container of clothing 45.30 L. minor 2) Automatic Washing Machine vertical axis, with container volume capacity clothes like or greater than 45.30 L. 3) Automatic Washing Machine horizontal axis. 4) Semi-automatic washing machine.	Sello FIDE for Washing Machines	applicable to models of washing machines of household electric drive type, agitator or drum machine operating with a nominal supply voltage of 127 volts at a frequency of 60 hertz.	Mandatory: Determined by energy factors across 4 product classes Voluntary: Models of household electric washing machines must have a value

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
				5) Manual washing machine.			equal to or better than 113 L / kWh / cycle (3.99 ft3/kWh/cycle).
New Zealand	AS/NZS 2040.1:2005	None	Energy Efficiency Labeling for Clothes Washers	Electric clothes washing machines intended for household and similar use. Examples of appliances are both horizontal and vertical axis single bowl machines, twin tub units and the washing function of combination washer/dryer units.	NEW ZEALAND ENERGY STAR® program for Washing Machines	All washing machines that have been tested to AS/NZS 2040.1:2005.	Energy Rating Index≥3.5; Water Rating Index ≥4.0
Chinese Taipei	JIS 9606; CNS 2926, US ENERGY STAR	None	None		Energy Conservation Label for Clothes Washers	Top loader (water jet, scroll, stir); Front-loader	Electricity consumption (kwh) / standard washing capacity (kg)
Thailand	IEC 60456	Under development	None		None		
The Philippines		Under development	None		None		
The United States	10 CFR Part 430 Subpart B App J , 10 CFR Part 430 Subpart B App J1 , AHAM HWL-1 , US ENERGY STAR	10 CFR Part 430: Energy Conservation Program for Consumer Products: Clothes Washer Energy Conservation Standards	EnergyGuide - Clothes Washers	Clothes washers are defined by type: horizontal- or vertical-axis; and by capacity: standard and compact.	ENERGY STAR- Clothes Washers; ENERGY STAR- Commercial Clothes Washer	Standard sized (> 1.6ft3), front- or top-loading clothes washers are eligible for the ENERGY STAR clothes washer program.	Modified energy factors (MEF) and water factors (WF) across 4 product classes (more stringent criteria in 2011.)

Clothes Dryers

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
Australia	AS/NZS 2442.1:1996/Amdt4: 2006	None	Energy Labeling for Rotary Clothes Driers	Electric rotary clothes dryers which are intended for household or similar use. It does not apply to static dryers or gas powered dryers.	None		
Canada	CAN/CSA-C361-92	MEPS for clothes driers	EnerGuide Label	Standard and compact electrically operated and electrically heated	None		Energy factors across 3 product

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
				household tumble-type clothes dryers			classes
Hong Kong, China	IEC 61121	None	None		Voluntary Energy Efficiency Labeling Scheme for Clothes Dryers	Electrically operated Clothes Dryers that have drying capacity normally not exceeding 10 kg for household use. This scheme also applies to the household electric clothes dryers of the air vented and condenser types, with or without automatic stop function for the drying process, and incorporating a heating device. Does not apply to clothes dryers of cabinet type in which the heated air is blown to dry the hanged clothes and is exhausted through an outlet channel.	4 product classes and 5 EE grades, measured by Energy Consumption Index, according to Average Energy Specific Energy Consumption (kwh/kg/cycle)
Malaysia	MS IEC 60335-1:2003 MS IEC 60335-2-4:2003 MS 1597: Part 2-7:2003 MS 1597:Part 2-43:2005 MS IEC 60335-2-11:2003		None	Electric washing machine; electric cloth dryers; tumbler dryers	None		
New Zealand	AS/NZS 2442.1:1996	None	AS/NZS 2442.2:2000 Energy Rating Label for Driers	Electric rotary clothes dryers intended for household and similar use. Examples of appliances include vented dryers, condenser dryers and the drying function of combination washer/dryer units.	None		
Singapore	IEC 61121:2005		Mandatory Energy Labeling Scheme for Clothes Dryers	Single-phase clothes dryer (not being second-hand good) having a rated capacity of up to 10 kilograms.	None		4 grades measured by Energy Consumption per cycle in kwh
Chinese Taipei		None	None		Energy Conservation Labeling Program for Clothes		Energy factor > 1.7 kg (clothes dried)/kWh

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
					Dryers		
Thailand	IEC 61121	Under development	None		None		
The Philippines		Under development	None		None		
The United States	AHAM A197.6	10 CFR Part 430: Energy Conservation Program for Consumer - Clothes Dryers (new standard to be completed by June 2011 and take effect three years later)	None	Clothes dryers are designed to remove moisture from clothes and other textiles by heating air, using either electricity or gas, and passing the heated air into a tumbler. Clothes dryers are typically manufactured with a vent to which an exhaust is fitted, but vent-less dryers are common in areas where space for venting is restricted, such as apartments or mobile homes.	GS-33 Green Seal's Environmental Standard for Hotel & Lodging Properties		Energy factors across 4 product classes

Water Heating

Electric Water Heating

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
Australia	AS/NZS 4692.1:2005	AS/NZS 4692.2:2005 MEPS Requirements for Electric Storage Water Heaters	None	Small main pressure water heaters (63 litres or less); vented water heaters (25 to 630 liter hot water delivery inclusive); heat exchange water heaters with a heat storage volume from 45 to 710 liters inclusive	None		
Brunei		None	None		Under development		

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
Canada	Mandatory: CAN/CSA-C191-00 Voluntary: CSA F379 / T.I.L. MSE-45	CAN/CSA-C191-00 MEPS for Electric Water Heaters	None	Stationary electric storage tank water heaters with a capacity of not less than 50 liters (11 imperial gallons) and not more than 450 liters (100 imperial gallons) that are intended for use on a pressure system.	ENERGY STAR for Solar Water Heaters	Certification from CSA International to CSA F379/Technical Information Letter (TIL) MSE.45	Mandatory: Measured by maximum allowable standby loss (W) across 4 product classes Voluntary: Net solar energy contribution equivalent to ≥ 7.0 GJ/year
China	GB 21519-2008	The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Electrical Storage Water Heaters	China Energy Label - Electrical Storage Water Heaters		China Energy Conservation Certification for Electrical Storage Water Heaters		Energy Consumption Coefficient & Hot water output rate
	GB/T19141-2003	None	None		China Energy Conservation Certification for Solar water heating system		
Hong Kong, China	EN 26; GB 6932; JIA F 031	None	None		Voluntary Energy Efficiency Labeling Scheme for Electric Storage Water Heaters	Electrically operated storage water heaters that have storage capacity not exceeding 300 liters for domestic use. Instantaneous water heaters are excluded. This scheme covers both vertically and horizontally installed electrical storage water heaters.	Average energy consumption due to standby loss per 24 hours across 4 product classes. 5 EE grades.
Indonesia		under development	None		None		
Korea		MEPS for Electrical Coolers and Heaters for Drinking-Water Storage	Energy efficiency labeling for Electrical Coolers and Heaters for Drinking-Water Storage	Electrical cooler and heater for drinking-water storage shall be designed the vapor-compressor cooler, heater, and water storage in a cabinet. (Water purifier is included) Rated cooling power consumption of not more than	None		

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
				500W and rated heating power consumptions of not more than 1000W.			
Mexico	NOM-003-ENER	None	None		Sello FIDE for electrical water heaters	Applicable to electric water heaters of step rate for domestic and commercial, in powers of 1 to 30KW, at voltages of 127 and 220 V and a frequency of 60Hz.	Models of Electric Water Heaters must have values of thermal efficiency equal to or greater than: 82% Note: The thermal efficiency must be obtained at a flow of water between 4 and 10 liters per minute.
New Zealand	Mandatory: AS/NZS 4692.1:2005; Voluntary: AS/NZS 2712:2007	AS/NZS 4692.1.2005: MEPS Requirements for Electric Hot Water Cylinders	N/A	Covering storage hot water cylinders except for those used in the dairy industry.	NEW ZEALAND ENERGY STAR® program (Criteria for Solar water heating systems Version 1)		
Peru	PNTP 370 502 2008	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	household type in which the primary operation control is about the temperature of stored water, with a capacity of up to 12 kW	None		
Chinese Taipei	CNS 11010-89	MEPS for Electric Water Heaters	None		Energy Label Program for Electric Storage Tank Water Heaters		
Thailand	TIS 1693	Under development	None		None		
The United States	10 CFR Part 430 Subpart B App E , ANSI / ASHRAE 118.2-1993 ,	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy	EnergyGuide - Electric Water Heaters	-electric storage water heaters with a capacity between 20 and 140 US gallons (76 to 530L) and an input of 12 kW or less and with a storage temperature of less than 180F; and	ENERGY STAR-Water Heater(Gas Condensing, Heat Pump, Solar, High Efficiency Gas Storage, and Whole	Storage-Heat Pump: A maximum current rating of 24 amperes, voltage no greater than 250 volts, and a transfer of thermal energy from one temperature to a higher temperature level for the purpose of	Mandatory: EF = 0.93–(0.00132 x rated volume) Voluntary: Combined criteria of

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
	ASHRAE 41.1-1986 (RA 01) , ASTM-D-2156-94 (1999)	Conservation Standards for Water Heaters		-electric instantaneous water heaters with an input of 12 kW or less; and -heat pump type units with a maximum current rating of 24 Amps and a voltage no greater than 250V. Intended for use on a pressure system.	Home Gas Tankless)	heating water. Unit must have "integrated" or "drop-in" configuration. Storage-Tabletop: A box enclosure designed to slide into a kitchen countertop space and dimensions of 36 inches high, 25 inches deep and 24 inches wide. Solar-Gas or Electric: OG-300 rating from the SRCC.	Energy Factor & First Hour Rating

Gas and/or Oil Water Heating

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
Australia	AS4552:2005	MEPS for Gas Water Heater due to commence in early 2011.	Mandatory Government label is under consideration.				
Brunei		None	None		Under development		
Canada	Mandatory: CAN/CSA-C191-00 Voluntary: CSA F379 / T.I.L. MSE-45	CAN/CSA-C191-00 MEPS for Electric Water Heaters	None	Stationary electric storage tank water heaters with a capacity of not less than 50 liters (11 imperial gallons) and not more than 450 liters (100 imperial gallons) that are intended for use on a pressure system.	ENERGY STAR for Solar Water Heaters	Certification from CSA International to CSA F379/Technical Information Letter (TIL) MSE.45	Mandatory: Measured by maximum allowable standby loss (W) across 4 product classes Voluntary: Net solar energy contribution equivalent to ≥ 7.0 GJ/year
China	GB 21519-2008	The Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Electrical Storage Water Heaters	China Energy Label - Electrical Storage Water Heaters		China Energy Conservation Certification for Electrical Storage Water Heaters		Energy Consumption Coefficient & Hot water output rate

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
	GB/T19141-2003	None	None		China Energy Conservation Certification for Solar water heating system		
Hong Kong, China	EN 26; GB 6932; JIA F 031	None	None		Voluntary Energy Efficiency Labeling Scheme for Electric Storage Water Heaters	Domestic Gas Instantaneous Water Heaters which burns gas types defined in the Gas Safety Ordinance, domestic gas appliances having heat inputs exceeding 70kW are excluded.	Verification type label
Indonesia		under development	None		None		
JAPAN	JIS S 2109; JIS S 2103;	Top Runner Program for Gas Water Heating	Label Display Program	Gas water heaters, except the following: 1) ones of water storage type, 2) ones for industrial use, 3) ones using gases other than either those of City Gas 13A group or liquefied petroleum gas for fuel, 4) bathtub water heaters installed inside of a bathroom, having an oxygen depletion safety shut-off device, 5) direct vent type bathtub gas water heaters whose air supply/exhaust outlet is connected to a duct.	Energy Saving Labeling Program	Gas water heaters, except the following: 1) ones of water storage type, 2) ones for industrial use, 3) ones using gases other than either those of City Gas 13A group or liquefied petroleum gas for fuel, 4) bathtub water heaters installed inside of a bathroom, having an oxygen depletion safety shut-off device, 5) direct vent type bathtub gas water heaters whose air supply/exhaust outlet is connected to a duct.	
	JIS S 3031	Top Runner Program for Oil Water Heating	Label Display Program	Oil water heaters, except the following, 1) bathtub gas water heaters with pot-type burners, 2) ones for industrial use, 3) ones having a structure for burning firewood, and 4) hot water boilers whose gauge pressure exceeds 0.1 MPa.	Energy Saving Labeling Program	Oil water heaters, except the following, 1) bathtub gas water heaters with pot-type burners, 2) ones for industrial use, 3) ones having a structure for burning firewood, and 4) hot water boilers whose gauge pressure exceeds 0.1 MPa.	
Korea		MEPS for Electrical Coolers and Heaters for Drinking-Water Storage	Energy efficiency labeling for Electrical Coolers and Heaters for Drinking-Water Storage	Electrical cooler and heater for drinking-water storage shall be designed the vapor-compressor cooler, heater, and water storage in a cabinet. (Water purifier is included) Rated cooling power	None		

Economy	Test Procedure	Mandatory Standard	Mandatory Label	Product Scope	Voluntary Label	Product Scope	EE Level
				consumption of not more than 500W and rated heating power consumptions of not more than 1000W.			
New Zealand	Mandatory: AS/NZS 4692.1:2005; Voluntary: AS/NZS 2712:2007	AS/NZS 4692.1.2005: MEPS Requirements for Electric Hot Water Cylinders	N/A	Covering storage hot water cylinders except for those used in the dairy industry.	NEW ZEALAND ENERGY STAR® program (Criteria for Solar water heating systems Version 1)		
Peru	PNTP 370 502 2008	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	Peruvian Technical Standard PNTP 370 502 2008 Energy Efficiency for electric water heaters with storage tank for domestic purposes	household type in which the primary operation control is about the temperature of stored water, with a capacity of up to 12 kW	None		
Chinese Taipei	CNS 11010-89	MEPS for Electric Water Heaters	None		Energy Label Program for Electric Storage Tank Water Heaters		
The United States	10 CFR Part 430 Subpart B App E , ANSI / ASHRAE 118.2-1993 , ASHRAE 41.1-1986 (RA 01) , ASTM-D-2156-94 (1999)	10 CFR Part 430: Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters	EnergyGuide - Electric Water Heaters	-electric storage water heaters with a capacity between 20 and 140 US gallons (76 to 530L) and an input of 12 kW or less and with a storage temperature of less than 180F; and -electric instantaneous water heaters with an input of 12 kW or less; and -heat pump type units with a maximum current rating of 24 Amps and a voltage no greater than 250V. Intended for use on a pressure system.	ENERGY STAR-Water Heater(Gas Condensing, Heat Pump, Solar, High Efficiency Gas Storage, and Whole Home Gas Tankless)	Storage-Heat Pump: A maximum current rating of 24 amperes, voltage no greater than 250 volts, and a transfer of thermal energy from one temperature to a higher temperature level for the purpose of heating water. Unit must have “integrated” or “drop-in” configuration. Storage-Tabletop: A box enclosure designed to slide into a kitchen countertop space and dimensions of 36 inches high, 25 inches deep and 24 inches wide. Solar-Gas or Electric: OG-300 rating from the SRCC.	Mandatory: EF = 0.93–(0.00132 x rated volume) Voluntary: Combined criteria of Energy Factor & First Hour Rating

APEC Project EWG 01/2010T

Produced by
ICF International (Beijing)

For
Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

APEC#211-RE-01.1