

## **SUPPORTING A NETWORK FOR ENERGY EFFICIENCY LABELS AND STANDARDS PROGRAMS IN DEVELOPING COUNTRIES**

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### **ABSTRACT**

Much of the developed world has gained experience and success with product energy efficiency standards and labeling programs over the last 20 years, and some developing countries have followed suit. Yet, many developing countries still have little or no experience in the field. Recently, a number of those countries recognized the potential economic and environmental benefits of standards and labeling and have begun to plan or develop such programs.

This paper summarizes the history of standards and labeling programs internationally and notes the current status of such programs. The paper goes on to describe the creation of a network for sharing international experience on the implementation of energy efficiency standards and labels and accessing the financial, technical, and information resources that are available globally for policymakers. A list of countries that have expressed interest in developing and implementing standards and labeling programs is also provided.<sup>1</sup>

### **THE STATE OF STANDARDS AND LABELING PROGRAMS WORLDWIDE**

The first mandatory minimum energy efficiency standards in modern times are widely believed to have been introduced in Poland for a range of industrial appliances as early as 1962. The French government set standards for refrigerators in 1966 and for freezers in 1978. Other European governments, including the Soviet Union, collectively introduced legislation mandating one or both of either efficiency information labels or performance standards throughout the 1960s and 1970s. However, much of this early legislation was weak and poorly implemented, had little impact on appliance energy consumption, and was repealed in the late 1970s and early 1980s under pressure to harmonize European trading conditions (Waide, Lebot 1997).

The first energy efficiency standards that dramatically affected manufacturers and significantly reduced energy consumption were mandated in the United States by the State of California in 1974 and became effective in 1977 and were followed later by national standards that became effective in 1990. Now 15 governments around the world have adopted mandatory energy-efficiency

standards. Some of these are developing countries that have only recently adopted the standards. A number of other developing countries have taken initial steps in the standards-setting process, and still others are aware the opportunity exists but are searching for the means – financial, technical, and human infrastructure –to make standards happen in their country.

Mandatory labeling programs have developed in parallel with standards. In 1976 France introduced mandatory energy labeling of heating appliances, boilers, refrigerators, clothes washers, televisions, ranges and ventilation equipment, allowing consumers to compare energy performance among similar product models. Germany, Canada and the U.S. shortly followed suit. The U.S. Energy Guide labels for major household appliances became mandatory in 1980, five years after the enabling legislation was passed. Worldwide, no new labeling programs were undertaken after that until Australia implemented its labeling program in 1987. The Australian program, like seven subsequent labeling programs that were created throughout the 1990s around the world, also covers major household appliances (Duffy 1996). Table 1 shows a history over the past three decades of the introduction of standards and labeling programs. It indicates the order that countries first adopted some element of such programs and the frequency of application of such programs to each product by the various countries. Since the initiation dates shown for each country, some of the countries have vastly expanded and updated their programs. The initial standard levels that were set for products have varied by country. For countries using standards for long-term impact, the intent is for the stringency to be gradually increased over time as part of a basic strategy for coaxing newly emerging energy efficiency technology into the marketplace.

### **BUILDING A NETWORK FOR PROGRAM ASSISTANCE**

To date there is sufficient experience worldwide with successfully establishing and running standards and labels programs that any new initiatives can benefit by drawing on previous experience and existing examples. The Collaborative Labeling and Appliance Standards Program (CLASP) is a U.S.-based organization formed in 1999 whose mission is to facilitate the design, implementation, and enforcement of energy efficiency standards and labels for appliances, equipment, and lighting products in developing and transitional countries throughout the world. In an attempt to draw on existing experiences and the wide variety of models, CLASP has developed a set of support tools for energy policymakers that includes: examples of country program experiences; sample presentations and materials that demonstrate the benefits and policy arguments in support of labeling and standards; interactive policy analysis tools; and sample labels and standards. These tools are free and available on the newly launched website, [www.CLASPOnline.org](http://www.CLASPOnline.org). While it originated in the U.S., CLASP is intended to become a worldwide collaboration open to all organizations engaged in supporting standard and label development.

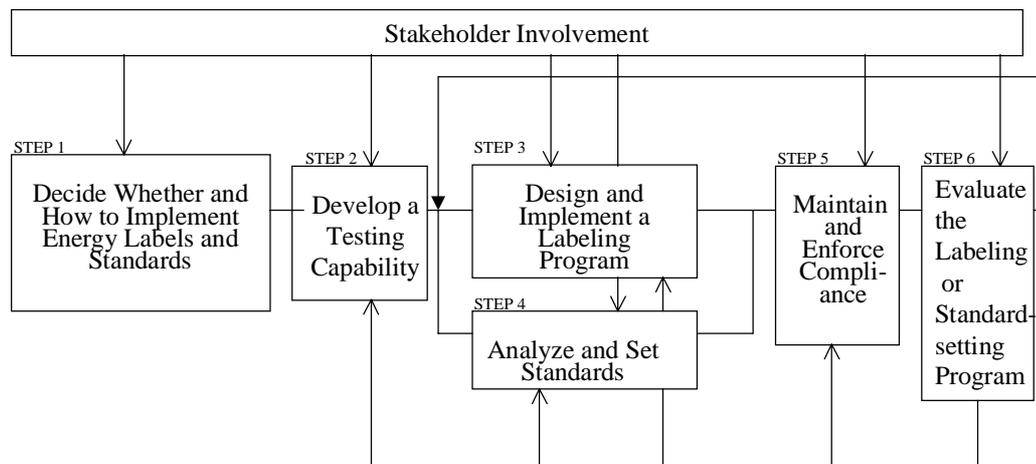
**Table 1. The History of Energy Efficiency Labels and Standards**

Product	France (1966)	U.S. (1976)	Germany (1976)	Russia (1978)	Canada (1978)	Japan (1979)	Taiwan (1981)	Australia (1981)	Brazil (1985)	N. Zealand (1986)	China (1989)	Malaysia (1989)	India (1991)	Korea (1992)	Sweden (1993)	Philippines (1993)	Thailand (1994)	Hungary (1994)	Switzerland (1994)	Mexico (1995)	Hong Kong (1995)	EU (1995)	Singapore (1996)	Norway (1999)	Indonesia (1999)	Poland (1999)	Turkey
Refrigerators	LS	LS	I	s	LS	LS	IS	LS	sL	I	S		s	LS	L	L	I	L	LS	LS	I	SL	I	L	I	S	
Room AC		LS		S	LS	s	IS	L	L	I	S		s	LS		LS	I			LS	I		S				
C. Washers	L	LS	I		LS		I	L		I	S			S					L	LS	S	I	LS	I	L		S
Freezers	S	LS		S	LS	LS	LS	s	I		S				L	L		L	LS			SL		L			
Ballasts		LS			IS	s	S		s		S	S		LS		S	I			L			I				
C. Dryers		S	I		LS		S	L		I								L	LS			LS	I	L			
Water Heaters	L	LS		S	IS		S	IS		I				L								S	I				
Dishwashers	L	LS	I	S	LS		L		I					LS					Ls					L			
Range/Ovens	L	S	I	S	LS		S												s			L					S
Lamps		LS			IS	s								LS		LS			L	S			I	L			
Central AC		LS			IS		S	L			S			LS						LS			I				
Motors		S			IS		S				S		S	L						LS			I				S
Televisions	L	I		S		s					S								s								
Monitors		I		S		I									I				Ls				I				
Space Heat	L	S					I							L													S
Computers		I		S		Is													Ls				I				
Printers		I		S	I	I													Ls								
Heat Pumps		LS			IS	s								LS													
Boilers	L													L								S					S
Furnaces		LS			S														S								
Copiers		I				Is													Ls								
Radio/Stereo		I		S							S																
Fax Machines		I				I													Ls								
Automobiles		L				s								LS													
VCRs		I				s													s								
Fans							S				S																
Irons				s							S																
Showerheads		LS			I																						
Faucets		LS			I																						
Windows		I			I																						
Range Hoods							S																				S
Scanners				S		I																					
Rice Cookers											S																
Elec. Kettles					s																						
Vac. Cleaners					s																						
Hard Drives						s																					
Skylights		I																									
Doors		I																									
MW Ovens			I																								
Dehumidifiers					S																						
Transformers																				S							
Pumps																				LS							
Pool heaters				S																							
icemakers					S																						

Symbols: I= voluntary labels; L= mandatory labels; s= voluntary standards; S= mandatory standards

Sources: General data from J. McMahon & I. Turiel, editors, Energy & Buildings special issue, Vol. 26, Num. 1, 1997.  
 J. Duffy, 1996. Energy Labeling, Standards and Building Codes: A Global Survey and Assessment for Selected Developing Countries  
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One of the key tools that will be posted to the website starting October 2000, is the practical *Energy Efficiency Labels and Standards: A Guidebook for Appliances, Equipment and Lighting* designed specifically for developing country policymakers (Wiel, McMahon, et al. 2000). It discusses in step-by-step detail the rationale for standards and labeling programs and the analytical, technical, policy, legal, and regulatory actions necessary to establish successful national standards and labeling programs. It also addresses how to assess the resources needed for successful program development and how to manage the political and strategic issues that arise throughout the process of recognizing and realizing the benefits of such programs. The major steps in this process, as identified in the *Guidebook*, are outlined below in Figure 1.



**Figure 1. Typical Steps in Developing Product Energy Efficiency Standards and Labeling Programs.**

The *Guidebook*, information materials, other support tools, and access to work produced by other policymakers, researchers, regulators, advocates and manufacturers in the field worldwide puts the website at the center of this global network. Experiences in program development are shared through CLASP-led regional workshops where experts gather and train together. Often, receiving guidance from a regional leader in standards and labels can speed a country's progress because of possible similarities in the institutional frameworks or even data collection. One example of this is with Mexico, where standards and labeling programs have been in place since 1995. Mexico's Comision Nacional Para El Ahorro De Energia (CONAE) is being funded directly by U. S. Agency for International Development (USAID) to work with CLASP to provide outreach to Latin American nations to promote the development and adoption of efficiency standards and labels for energy consuming products.

Another example of regional leadership is the successful energy labeling program in Thailand. Countries from across Asia have recognized the success of the Thai program, which relies on a voluntary agreement between the electric utility and manufacturers. In early 1994, the Electricity Generating Authority of Thailand (EGAT) approached the five major household refrigerators manufacturers in Thailand and quickly gained their cooperation for a voluntary

energy labeling program. Testing began during the fall of 1994, and labels first appeared on store models in early 1995. The remaining refrigerator manufacturers followed suit. The program was accompanied by a massive (~\$8 million) national television advertising campaign. A comprehensive process and impact evaluation of the program was conducted in 1999 and found that it was highly cost effective, with a benefit cost ratio to the customer of 2.2 and to the utility of 9.8. From a total resource perspective, the benefit-cost ratio was 2.8. (Agra-Monenco 2000) This type of program shows the potential market transformation impact of labeling, in combination with a strong consumer awareness campaign. A number of countries have sent their energy officials and program managers to Thailand to study the design and operation of the Thai program so that they can adapt the experience in their own country.

### **Assessing the Resources Needed for Developing an Energy Efficiency Standards and Labeling Program**

Access to information and experience from other countries is a start to developing energy efficiency standards and labeling programs. Actual implementation requires legal, financial, human, physical, and institutional resources. Each of these will already exist to some degree in every country and each is likely to need at least a little, if not major, bolstering to facilitate an effective standards or labeling program. Each country is unique and will need to assess its resources at home before getting started. In the U.S., where national mandatory energy efficiency standards began in 1978, and the program has developed (and in six cases updated) 28 residential and commercial product standards, the investment has proven to be very effective. Over the first 19 years of the program, the U.S. government spent \$104 million in developing and implementing these standards. The U.S. government spent an average of \$5.5 million annually, with never more than \$11.3 million or less than \$2.3 million spent in a single year. This corresponded to a range of 2¢ to 12¢ per household per year. The payback on this endeavor has been enormous, with energy benefits well over 100 times the program cost (Koomey et al 1998.).

Experience shows that even a small level of initial investment yields a significant reward. For many developing countries, coming up with that initial investment is difficult. Or even if it is possible, they may lack the technical expertise necessary to complete all the necessary assessments and analyses to develop a proper program with long term viability and benefit. Typically, a combination of financial and technical assistance yields the best results.

### **Countries Need Assistance and Access to Technical Support Programs**

Even after standards and labeling programs are identified as priority activities and countries make investments in them, to claim success there often remains a recognized need among developing countries for continued financial and technical assistance. In a letter to the Collaborative Labeling and Appliance Standards Program (CLASP), a representative from the Sri Lankan Ceylon Electricity Board (CEB) outlined that even though:

- “CEB has identified appliance energy labeling as an important measure to be implemented jointly with the Sri Lanka Standards Institution in a major drive to assist and encourage customers to select energy efficient appliances,” and

- “CEB expects to extend (testing and labeling) to most of the appliances by year 2002,”

there is still a need for follow-on assistance including :

- “additional equipment to strengthen testing capabilities; further training on testing and labeling for testing authorities, suppliers and concept promoters; and....development of large scale publicity programs for labeling.”

Similarly, the China Energy Conservation Association expressed that among the issues critical to the successful implementation of energy efficiency standards and labels in China are,

- “Technical assistance services, including policy, analytical, logistical and advocacy support; training education and compliance programs; advanced measuring and testing methods and equipment,” and
- “Convenient access and exchange of the information on standards and labels.”

A list of additional countries and institutions that have expressed interest in CLASP’s help with labeling and standards programs appears in Table 2.<sup>2</sup>

Technical assistance programs are as varied as the countries requesting support. Help is often available through bilateral and multilateral grants and loans to do such things as:

- Assess the potential benefits and costs of standards and labels.
- Establish appropriate legal frameworks for standards and labels.
- Develop test procedures, laboratory services, and labeling schemes.
- Set cost-effective standards, utilizing various analytical methodologies.
- Monitor and report on standards and labels.
- Train government officials, utility company employees, product manufacturers, product distributors and salespeople, architects and designers, environmental activists, and/or consumers in any aspect of the design, development, implementation and use of energy efficiency standards and labels.

The good news is that the benefits of standards and labeling programs are being recognized and actively promoted by a number of institutions. For example, the US President’s Council of Advisors on Science and Technology introduced in its 1999 Initiative on Buildings the goal to:

“Reduce energy use of new buildings in developing and transition economies by 2020 by assisting them to develop efficiency standards, ratings and labeling for building equipment as well as design tools, energy codes, and standards for building shells.

Encourage multilateral banks and the Global Environment Facility in support of these measures.”

**Table 2. A Selection of Countries and Institutions Seeking Support for Energy Efficiency Labeling and Standards Programs**

<b>Country</b>	<b>Institution(s)</b>
Bahrain	Conservation Department, Ministry of Electricity and Water
Bulgaria	Black Sea Regional Energy Centre Committee of Standardisation and Metrology Center for Energy Efficiency
China	Resources Efficiency and Utilization Department, within SETC China Energy Conservation Association, within SETC China Energy Conservation and Investment Centre Shanghai Energy Conservation Supervision Centre
Egypt	Egyptian Electricity Authority
Ghana	Ministry of Mines and Energy Energy Foundation of Ghana
Hungary	International Finance Corporation – Hungary Energy Efficiency Co-financing Program
India	Centre for Environment Education
Indonesia	University of Indonesia
Iran	Ministry of Energy and Sharif University of Technology
Lebanon	Electricite du Lebanon
Malaysia	Department of Electricity and Gas Supply
Mexico	National Commission for Energy Conservation (CONAE)
Poland	National Energy Conservation Agency (NAPE) Foundation for Energy Efficiency (FEWE) Department of Energy, at the Ministry of Economy Network of Energy Cities, Association of Municipalities
Romania	Romanian Energy Policy Association (APER) Agency for Energy Conservation, Min. of Industry and Trade
Russia	Ministry of Fuel and Energy Center for Energy Efficiency
Saudi Arabia	Energy Research Institute, KACST
Sri Lanka	Ceylon Electricity Board
Thailand	Department of Energy Development and Promotion Electrical and Electronics Institute
Tunisia	Agence Nationale Des Energies Renouvelables
Vietnam	Energy Conservation Office Vietnam Standard and Consumer Association
Ukraine	State Committee for Energy Conservation Agency for Rational Energy Use and Ecology (Arena-Eco)
Yemen	Public Electricity Corporation, Min. of Electricity and Water

In addition, the 1999 United Nations Foundation (UNF) Strategic Discussion on Climate Change states,

"Within the broad area of the changes required in the energy systems of both developing and developed countries, UNF has chosen two specific programmatic areas which would have a highly leveraged impact on the future development patterns of the developing world: energy efficiency labeling and standards, and community-based rural electrification using sustainable energy technologies."

Several organizations have grant programs providing technical expertise to developing countries specifically for developing energy efficiency standards and labeling programs. The most prominent of these are:

- The United States Agency for International Development (USAID) -- offering training and technical assistance with energy-efficiency standards and labeling programs for most countries, with special emphasis on the Western Hemisphere. USAID has been active in the development of a variety of support tools, such as a Website, a Guidebook and web-based training tools.
- The United Nations Department of Economic and Social Affairs (UN/DESA) -- assisting six Arab countries with energy standards, implementing a refrigerator efficiency project in China, and now offering assistance for all aspects of energy efficiency standards and labeling programs worldwide through a grant from the United Nations Foundation.
- United Nations Economic Commission for Latin America and the Caribbean (UN/ECLAC) - is working with several countries in Latin America to enact legal and regulatory reform for energy standards through a parliamentary approach.
- United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP) -has organized workshops in numerous countries in Asia promoting energy standards.
- United Nations Economic Commission for Europe -(UN/ECE) promotes standards under its Energy Efficiency 2000 program and manages some European Commission programs in Eastern Europe
- The Global Environmental Facility (GEF) administered through the World Bank, UNDP and UNEP to provide grants for greenhouse gas mitigation -- For example, GEF has contributed \$9.8 million to a \$40 million program to improve the efficiency of refrigerators in China, including the development of stringent energy efficiency standards. Other GEF activities include support for standards and labels in Egypt and Tunisia.
- The United Nations Development Program (UNDP) – See GEF entry above.
- The United Nations Environmental Program (UNEP) – See GEF entry above.
- The European Commission's Directorate General for Transport and Energy (DG TREN) sponsors projects to promote energy efficiency programs, including labeling and appliance market transformation, in European Countries outside the European Union. It also has programs to foster collaboration with Latin America and Asia on energy efficiency.
- ADEME, the French Agency for the Environment and Energy Management, collaborates to promote energy efficient appliances in North Africa, the Middle East and Asia.

In addition to grant programs, multilateral banks are increasingly recognizing that energy efficiency standards and labels are cost effective for the implementing government and have been providing loans to fund various aspects of their development. So far we are aware of such loans from:

- The Asian Development Bank (ADB),
- The Interamerican Development Bank (IDB), and
- The World Bank (The International Bank for Reconstruction and Development, IBRD).

Various foundations are also supporting standards and labeling activities. Among these are:

- The United Nations Foundation,
- The Energy Foundation, and
- The Packard Foundation.

Furthermore, there are many other organizations worldwide involved in the various aspects of developing standards and labeling programs. These organizations include manufacturer associations, standards setting organizations, testing laboratories, government agencies, lending institutions, consultants, universities, and public interest advocacy groups.

## **CONCLUSION**

International experience indicates that standards and labeling program benefits are being realized by a handful of countries, most of which are in the developed world. But, the developing world is rapidly recognizing the beneficial effects of this effective policy tool and the implementation of these programs is spreading.

Today, some developing countries are making commitments to standards and labeling programs and assessing their needs to make such programs successful. For each country, including those just beginning, determining its stage in the standards and labels development and/or implementation process and the readiness of its relevant institutions to support such a program will enable it to identify specifically its technical and financial assistance needs. There are a number of financial and technical support institutions that are aware of this need and are involved in realizing the benefits of standards and labels. Organizations like CLASP are working to develop a network for energy professionals and policymakers where they can access and share information, tools and contacts to support their efforts.

## **ENDNOTES**

<sup>1</sup> The focus of the paper is on standards and labeling approaches for appliances and energy-using equipment. It does not address building codes or standards for building materials.

<sup>2</sup> At the request of the UNF, CLASP and its partner UN/DESA invited national institutions to draft letters of support for the CLASP concept. The countries and institutions cited in this section and listed in Table 2 responded to this invitation. Their letters of interest are a part of a CLASP/UNDESA UNF Project Document.

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