

1. Current Scenario:

With the welcome economic growth, usage of various appliances like refrigerators, computers, air conditioners, geysers, colour televisions, office equipments, etc., is on the rise in India and is resulting in substantial increase in the demand for energy. High energy consumption leads to increased energy demands, concentration of carbon dioxide in the atmosphere and a surge in global temperatures. The rate of economic development of a country is directly linked with the supply of energy. An affordable, reliable supply of energy is vital for continued economic expansion, yet the cost of new supply facilities is staggering. If energy supply capacities are expanded without promoting more efficient use of energy, the amount of capital invested will eclipse the economic growth it seeks to sustain. The simplest way-out of this development challenge is to use the energy more efficiently. "Energy conserved is energy produced" is the slogan used the world over to raise public awareness on the importance of efficient use of energy. Electricity conservation measures are often cheaper than building new power plants. Using more efficient lights and appliances, agricultural & industrial motors, better insulation etc., can significantly reduce the energy supply required. Across the world, people have become conscious of the demand versus supply equation and are finding new ways to use energy judiciously.



1. Source: USEPA

Production of energy by various means is associated with many environmental

problems. For example, coal power plants have local effects such as air pollution particularly Oxides of Nitrogen and Sulphur. They also have medium-range effects such as acid rain along with long-term climate change impacts such as global warming, from the emission of Carbon dioxide and other 'greenhouse gases'. Nuclear plants have their own environmental consequences related to the handling of nuclear materials and the disposal of radioactive waste. To save our environment, it is all the more necessary to adopt energy conservation measures.

2. What are Energy-Efficiency Labels and Standards?

Energy labels (or more explicitly called energy-efficiency labels) are informative labels affixed to manufactured products to indicate the product's energy performance. Usually they are in the form of relative rankings of energy performance. The energy parameters indicate quantitatively how much energy is consumed by the product or the energy efficiency rating of that product and/or, other related requirements. Energy labels can stand alone or complement energy standards.

3. Objectives of Standard & Labeling of India:

The Objectives of the Standards & Labeling (S&L) Program are:

- (i) To provide the consumer an informed choice about the energy saving, and thereby the cost saving potential of the labeled household products and other electronics/electrical products.
- (ii) To impact the energy savings in the medium and long run.
- (iii) To position domestic industry to compete in international markets where norms for energy efficiency in many countries are mandatory.

The S&L scheme was launched by the Bureau of Energy Efficiency Govt. of India in May,

2006 and is currently in place for equipments/appliances that include Frost Free Refrigerators, Tubular Fluorescent Lamps, Room Air Conditioners, Direct Cool Refrigerators, Distribution Transformers, Electric Motors, Pump Sets, Ceiling Fans, LPG Stoves, Electric Geysers, Colour TVs and Washing Machines.

Energy labeling of BEE is generally linked with the performance and safety parameters as prescribed in the national standards, and products that qualify for the energy labeling are first expected to meet these requirements, thus linking energy efficiency and high-quality performance.

4. Formulation of Energy Efficiency Standards:

Energy Efficiency Standards are the procedures and regulation that prescribe limits on the energy consumption (or minimum levels of the energy efficiency) of manufactured products. These measurements are based on prescribed test protocols/procedures that ensure accurate and consistent estimates of the existing & achievable level of energy performance. Throughout the world, standardization has been used as an effective tool for tackling energy problems.

4a. Significance of Energy-Labeling:

Without a credible energy label, a consumer looking at an appliance has no idea whether a product saves energy or is an energy guzzler. The energy usage pattern of an appliance is usually hidden from the naked eye, and invariably not known to the user. However, energy consumption determines the operating cost of most appliances and is therefore of concern to the consumer and his pocket. Consumers are sometimes aware of only some basic details, such as wattage/units and act on that information. But wattage alone is no substitute for the information that an energy label provides, like lumens/watt of a lamp or the Energy Efficiency Ratio (EER) of an Air Conditioner.

Like other Energy Efficiency programs, energy labeling aims to market transformation for energy-using products and appliances toward greater energy efficiency. Energy

labeling programs help consumers to understand which products are most efficient and influence them to choose more efficient ones. At the same time, they create healthy competition among manufacturers to produce and market the most energy-efficient models and thus promote efficiency.

1.4b. Types of Energy Labels:

In broad terms there are two distinct types of energy labels in use around the world, namely 'Endorsement Labels' and 'Comparison Labels'.

4b. i - Endorsement labels are a seal of approval indicating that products meet certain specified criteria. Typically, they are applied to the top-tier of energy-efficient products in the market. An example of an endorsement label for energy efficiency is the U.S. ENERGY STAR label initiated in 1992. During the past decade, a number of endorsement labels have also been developed and implemented in the many developing countries. China had initiated an energy-efficient endorsement labeling program in 1998. There are few more countries that have also adopted the endorsement labels in their S&L program.

4b ii - Comparison labels show the relative energy use of a product compared to other models available in the market. These labels also use a step-ranking system to indicate relative energy use compared to other models. This type of labeling is being followed in EU, Thailand, Iran, Korea, Australia, India etc. India has particularly chosen this comparative labeling scheme for most of the appliances as it empowers the consumers on choice of the products based on 1 to 5 star label ratings and also brings market transformation on promotion of most efficient products.

5 Potential Benefits of Energy Efficiency Labels:

Energy-performance improvements in consumer products are essential elements of energy-efficiency policies and climate change-mitigation programs. When designed and well implemented, their advantages are:

- i) They can produce large energy savings;
- ii) They can be very cost-effective and helpful at limiting energy growth without limiting economic growth;



iii) They require change in the behaviour of a manageable number of manufacturers rather than the entire consuming public which is much larger & harder to reach; and

iv) The resulting energy savings are generally assured, comparatively simple to quantify, and readily verifiable.

The effect of well-designed energy-efficiency labels and standards is to reduce unnecessary electricity and fuel consumption by household and office-equipment, (e.g., Refrigerators, Air-Conditioners, Water Heaters, Electronic Equipment etc.). Reducing electricity use reduces the fuel combustion in electric power plants.

Significant benefits of Energy Labeling include:

i) Reduction in capital investment for energy supply infrastructure;

ii) Enhancement in national economic efficiency by reducing energy bills;

iii) Enhancement in consumer welfare, as the scheme empowers consumers with data on informed choices and encourages selection of the most efficient products.

iv) Strengthening competitive markets;

v) Meeting climate change goals through reduction of CO₂ / GHGs; and

vi) Averting urban/regional pollution.

6. Energy Labeling Program in India and Role of BEE

The Bureau of Energy Efficiency (BEE) was established in India on 1 March 2002, under the Energy Conservation Act (EC) 2001, and is responsible for spearheading the improvement of energy efficiency in the economy through various regulatory and promotional instruments. As one of its objectives for promoting energy conservation, BEE has devised an energy labeling system, where the energy efficiency label (Comparative) has 1 to 5 Star Ratings with an indicator that shows what star rating a particular product has earned (1 star for least efficient up to 5 star for most efficient).

The greater the number of stars that the product has, the better it is in terms of energy efficiency. The label also specifies the energy consumption of the appliance under standard test conditions.

BEE has selected target products for the energy labeling program based on criteria that include: i) significant energy consumption, ii) contribution to the peak load and iii) number of units sold and used.

BEE has already implemented energy labeling program for 12 products namely Refrigerators, Tubular Fluorescent Lamps, Air-Conditioners, Direct Cool Refrigerators, Distribution Transformers, Electric Motors, Ceiling Fans, Ballasts (Chokes), Agri. Pump Sets, Geysers, Gas Stoves, Color TVs and Washing Machines.

6. Refrigerator Labeling:

Energy efficiency standards and labeling for Frost Free Refrigerators in India was implemented initially keeping in view the growing market share of this category. The energy label affixed to Refrigerators include information about brand, model, type, gross and storage volume as well as the standard test method used for arriving at average annual energy consumption as marked on the centre of the energy label. Due to the encouraging response and participation from manufacturers, most of the brands manufactured in India are covered under the BEE energy labeling scheme. Energy labeling for the direct cool category of refrigerators was also later implemented. This extends the star label to the product category (Direct Cool Refrigerators) that presently has the major market share. Since Refrigerators remain switched-on throughout the year, the nominal consumption and star rating has been calculated based on the annual electricity consumption.



7. Potential Savings of Money on Energy Labeled Products

More stars mean more energy efficiency and more savings on your monthly energy bills.

For Refrigerators (FF), there is an annual savings of about Rs. 2,130/- on the use of a 5 star labeled Refrigerator versus a no star Refrigerator of 250 litre capacity. For Air Conditioners (1.5 ton of split type), there is about a saving of around Rs. 3,500 by using of 5-Star labeled Air Conditioner versus a 1 star. This means a saving for individual consumers of about 700 units (kWh) of electricity with the most efficient Refrigerator and 750 units (kWh) with the most efficient Air Conditioners. Since Refrigerators & Air Conditioners constitute more than 50% of the domestic electricity consumption², the use of the most efficient ACs and Refrigerators can significantly reduce India's electricity consumption and energy costs.

Similarly for other major products, energy saving potential is also possible viz.

♦For 48" (1,200 mm) Ceiling Fans (highest selling), there is a large energy saving potential using a 5 star fan. This equates to 0.19 kWh (Rs. 0.85) per day; Rs. 26 month; Rs. 310 or 69 units (kWh) of electricity every year.

♦For Color 21" TVs, with a 5 star appliance Total savings on use of 5 stars labeled TV would be 0.264 kWh watts (Rs. 1.19) per day or 96 kWh / Rs. 433 per year against 0 stars.

2. Based on BEE data

♦In electric Geysers, you save 0.81 kWh or Rs.3.63 per day or Rs. 1,325 / 296 kwh per year.



♦For Refrigerators Direct Cool : You save 1.29 kWh or Rs. 5.80 per day or Rs.2,120/ 470 kWh per year against 0 star (Savings have been calculated based on average energy tariff @ Rs. 4.5 per unit)

The S&L program being implemented by BEE in India is the hallmark or certificate of Energy Efficient product quality. The star label provides consumers with informed choices on energy and money saving potential, in addition to an assurance of a better quality product.

NECESSITY OF ENERGY EFFICIENCY STAR LABELING IN INDIA

Summary

The Energy Efficiency Standard & Labeling (S&L) program has been successfully implemented in many countries and has brought significant impacts in terms of availability of higher quality energy efficient equipments in the market places resulting in energy as well as money savings for consumers on use of energy labeled products, a healthy competition in the markets through market transformation and lesser pressure on generation of additional power. The implementation of S&L program in US alone has displaced over fifty thousand MW of electricity¹ To a large extent it has also addressed the issue of climate change through the reduction of greenhouse gases (GHG) including carbon dioxide. Due to the this transformation, Bureau of Energy Efficiency (BEE) a designated agency empowered by Ministry of Power, Govt. of India, under EC Act 2001, has implemented the energy efficiency S&L program in India. As on date BEE has successfully registered 12 products under the scheme out of which 4 products are under the mandatory labeling regime, these are frost free refrigerators, room air conditioners, Tubular Fluorescent Lamps (TFL) and distribution transformers. The other products under the program are direct cool refrigerators, induction motors, agriculture pump sets, ceiling fans, LPG stoves, electric storage type geysers, colour televisions and washing machines. BEE has been closely working with various key stakeholders through its Steering & Technical committees for the effective implementation and monitoring of S&L program.

References: CLASP, BEE, USEPA etc

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