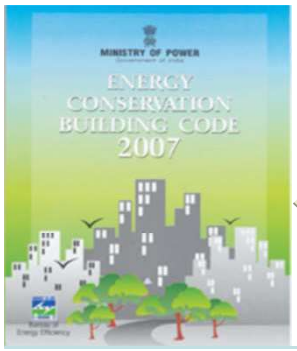
2.3.1 Energy Conservation Building Codes (ECBC)



Energy Conservation Building Codes (ECBC) was developed to deal with rapidly increasing energy consumption in commercial buildings. ECBC sets minimum energy efficiency standards for design and construction of commercial buildings.

ECBC encourages energy efficient design or retrofit of buildings so that

- Building funciton, comfort, health and the productivity of the occupants is considered
- Life cycle costs (i.e. construction and energy cost are minimized)

ECBC defined the norms of energy requirement per sq.metre of area and takes into consideration the climatic region of the country, where the building is located. The owners or occupiers have to comply with energy consumption norms and standards and / or to prepare and implement schemes for its efficient use and conservation. Central Government can prescribe energy conservation building codes and direct owners/ occupiers to comply with them. State Governments can modify the codes to suit regional and local climatic conditions.

For details on energy conservation in buildings and ECBC, reader is advised to refer Book-3, Chapter 10.

2.3.2 Standards and Labeling (S&L)

There is a wide variation in energy consumption of similar products by various manufacturers. Also information on energy consumption is often not easily available. This leads to continued manufacture and purchase of inefficient equipment and appliances.

The objectives of Standards & Labeling Program is to provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the marketed household and other equipment. This is expected to impact the energy savings in the medium and long run while at the same time it will position domestic industry to compete in such markets where norms for energy efficiency are mandatory.

The main provision of EC act on Standards and Labeling are:

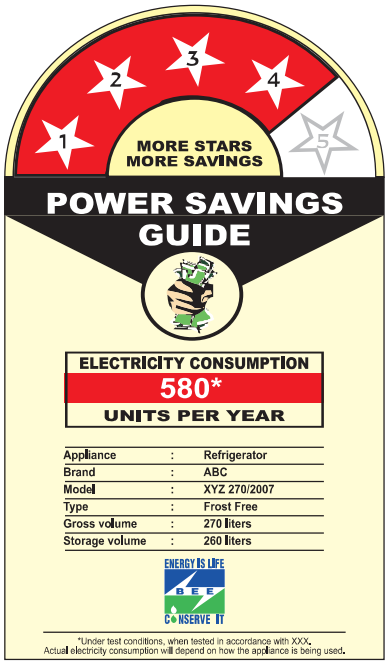
- Recommend to the Central Government, the norms for processes & energy consumption
- standards for any equipment which consumes, generates, transmits or supplies energy.

- Recommend to the Central Government the particulars required to be displayed on label of equipment or an appliances and manner of their display.
- Prevent manufacture, sale and import of such equipment, which does not comply with the notified standards.
- Promote use of energy efficient processes, equipment, devices and systems;
- Spread information on the benefits to consumers

Standard: Energy-efficiency standards are procedures and regulations prescribing the energy performance of manufactured/ commercially sold products sometimes prohibiting the sale of products that are less efficient than a minimum level. The term "standards" commonly encompasses two possible meanings:

a) well-defined test protocols (or test procedures) to obtain a sufficiently accurate estimate of the energy performance of a product, or at least a relative ranking of its energy performance compared to that of other models; and

b) target limits on energy performance (usually maximum use or minimum efficiency) based on a specified test protocol.



Labels: Energy-efficiency labels are informative labels affixed to manufactured products to describe the product's energy performance (usually in the form of energy use, efficiency). These labels give consumers the data necessary to make informed purchases. Mainly there are two types of labels namely,

a) Comparative label: allow consumers to compare efficiency of all the models of a product in order to make an informed choice. It shows the relative energy use of a product compared to other models available in the market.

b) Endorsement label: define a group of products as efficient when they meet minimum energy performance criteria specified in the respective product schedule/regulation/statutory order.

Minimum Energy Performance Standards (MEPS): MEPS prescribe minimum efficiencies (or maximum energy consumption) that manufacturers must achieve in each product, specifying the energy performance(or output) but not the technology or design details of the product. The MEPS will be reviewed and upgraded periodically to enhance & ensure the availability of energy efficiency product in the market.

Star Ratings: A ranking system based on energy efficiency of an appliance declared by manufacturer. Depending upon the performance of an appliance, they are rated on a scale of star 1 to star 5. The number of stars depends on the highest pre-set threshold for energy performance that the appliance is able to meet. Therefore, Star 1 is the least energy efficient (and hence the least money saved) and star 5 is the most energy efficient (and hence more money saved).

Label period: The validity period of the energy efficiency label under the energy consumption standard specified by the Central Government under clause (a) of Section 14 and in case the end period of the energy efficiency label is not specified, it shall be deemed to be valid until a new energy efficiency level is announced by the Central Government.

Appliances/equipment covered under S&L program:

In the 11th plan, S&L Programme has been expanded to 18 equipment out of which 4 equipment are introduced for mandatory S&L scheme from 7th January 2010. The equipment under the mandatory labeling program are:

1. Household Frost Free Refrigerators
2. Room Air Conditioners
3. Tubular Fluorescent Lamps
4. Distribution Transformers (up to 200 KVA)

			
Frost-free Refrigerator	TFL	AC	Distribution Transformer

The following equipment have been introduced under voluntary labeling scheme:

1. Direct Cool Refrigerators
2. Induction Motors
3. Ceiling Fans
4. Agricultural pump Sets
5. Color Televisions
6. Electric Water Geysers
7. Laptop & Notebook
8. Office equipments
9. LPG Stoves
10. Cassette/Floor standing ACs
11. Solid State Inverters
12. Diesel Generators
13. Ballast
14. Diesel Engine driven moonset pumps for agricultural purpose
15. Washing Machine

(Note: More Details are available at www.beestarlabel.com)

Example: Energy & Cost Savings estimation for Star rated appliance

Comparison of Star Rated Refrigerator with Non Star rated Refrigerator (220 Liters)

S No	Parameter	Star Rated Refrigerator	Non Star Rated Refrigerator
1.	Cost	Rs 17,000/-	Rs 10,000/-
2.	Star level	5 star	No star
3.	Annual Electricity consumption	204 Units	520 Units
4.	Annual Electricity savings	316 Units	
5.	Annual Electricity Cost (@Rs 5/ Unit)	Rs 1020/-	Rs 2600/-
6.	Annual Money Savings	Rs 1580/-	
7.	Payback Period	1-1.5Years	

Note: The cost of refrigerators & electricity consumption non star refrigerator is an assumption for savings estimation. The actual value may vary.

2.3.3 Demand Side Management (DSM)

Demand Side Management (DSM) means managing of the demand for power, by utilities / Distribution companies, among some or all its customers to meet current or future needs. DSM programs result in energy and / or demand reduction. For example, under this process, the demand can be shifted from peak to off peak hours thereby reducing the need for buying expensive imported power during peak hours. DSM also enables end-users to better manage their load curve and thus improves the profitability. Potential energy saving through DSM is treated same as new additions on the supply side in MWs. DSM can reduce the capital needs for power capacity expansion.

Pilot study undertaken by BEE has indicated energy saving potential of 40% by replacement of inefficient pumps with Star rated pump sets. BEE has prepared an Agricultural DSM (Ag. DSM) programme in which pump set efficiency upgradation could be carried out by an Energy Service Company (ESCOs) or distribution company. The implementation for replacement of inefficient pumps with Star rated pump sets will be done through the ESCO/Utility who would invest in energy efficiency measures on a rural pump set feeder on which supply quality enhancements (such as feeder segregation & High Voltage Direct Supply (HVDS) have already been carried out.

Almost all municipal bodies depend on government support to meet their development and operating expenses. Government of India, through the Bureau of Energy Efficiency has initiated a municipality DSM programme to cover 175 municipalities in the country by conducting investment grade energy audits and preparation of detailed project reports. Energy Service Companies are being encouraged to take up the implementation of the programme with the help of financial institutions.