

# STAR LABELING PROGRAM IN INDIA



*Presentation By*

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# ENERGY CONSERVATION

**Energy Conservation in simple terms means Avoidance of Wastage of Energy Without Sacrificing Comforts & Needs.**

**Energy can be saved by the following simple methods**

- **Avoiding wastage of energy**
- **Improving Efficiency of Equipments**
- **Using Alternate Sources of Energy**

# ENERGY CONSERVATION ACT IN INDIA

- **Energy Conservation Act was enacted in Parliament, in 2001.**
- **Govt. of India set up Bureau of Energy Efficiency (BEE), a statutory body under Ministry of Power, on 1st March 2002, under the provisions of the Energy Conservation Act 2001.**
- **One of the Regulatory functions of BEE, under this Act, is to develop minimum Energy Performance Standards & Labeling, for equipment / appliances and buildings.**
- **Participation in the scheme was voluntary in the beginning.**



**STAR LABELING  
PROGRAM IN  
INDIA**

# WHAT IS STAR LABELING

- An energy-efficiency rating scheme for Electrical appliances/ Buildings .
- The rating will grade Equipments/ Buildings on their energy efficiency, starting from one star for the least energy-efficient, and going up to five stars, for the most energy-efficient .
- Star Labels have been created to standardize the energy efficiency ratings of different electrical appliances and indicate energy consumption under standard test conditions.

# OBJECTIVES OF STAR LABELING

- To provide information on energy performance so that consumers can make informed decisions while purchasing appliances
- To make aware the consumer about the **energy saving potential** among the available products
- The **cost saving potential** of the marketed household and other equipments
- To create a demand in the market for Energy Efficient equipments.

# STAR LABELING OF EQUIPMENTS

The Bureau of Energy Efficiency has developed a scheme for energy efficiency labeling of equipments, in MAY 2006.

Under this scheme, the following equipments have been star rated.

1. Frost Free (No-Frost) refrigerator \*\*\*
2. Tubular Fluorescent Lamps \*\*\*
3. Room Air Conditioners \*\*\*
4. Direct Cool Refrigerator
5. Distribution Transformer \*\*\*
6. Induction Motors
7. Pump Sets
8. Ceiling Fans
9. LPG Stoves
10. Electric Geysers
11. Colour TV

\*\*\* BEE Star Label is now mandatory for these equipments from 7th January 2010

# STAR LABELING LOGO – AN EXAMPLE

- The stars highlighted in colour indicate the relative efficiency of the equipment. The more the number of stars - More the savings in Energy and Money.
- This is the average amount of electricity used by the equipment in a year, in KWh/ year. This is under standard test conditions .
- Additional information about the Equipment. For eg. in Refrigerator:  
The Brand, Type, Model No., Year of Manufacture, Gross volume, Storage volume.

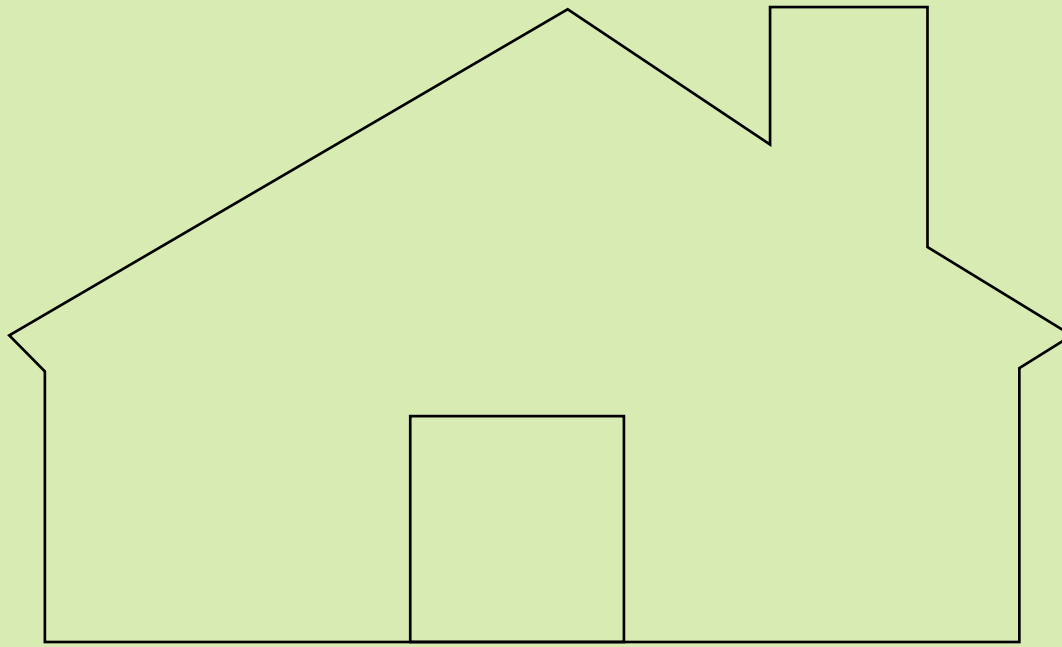
Sample BEE Label for Refrigerators & Air Conditioners



MORE STARS \* MEANS  
MORE ENERGY EFFICIENT

# PARTICIPATION PROCESS

- **Manufacturers of equipment can participate in the scheme by registering with the BEE.**
- **A separate application will be made by the Manufacture for each equipment/ model, along with non - refundable registration charges and labeling fee. An agreement will be made with the Bureau of Energy Efficiency .**
- **After receiving the complete application for an equipment/model, the Bureau will scrutinize the application, and seek further information, if required, within a month from the date of receipt.**
- **The user of label will print and affix the labels as per the label design, manner of display, and the rating plan prescribed for the particular equipment**
- **A list of labeled equipment (and information on the label) will be maintained by the Bureau and made available to the public through publications and its web site**



# **STAR LABELLING OF BUILDINGS**

# STAR LABELING OF BUILDINGS

- **The Bureau of Energy Efficiency has developed a scheme for energy efficiency labeling of Buildings, in February 2009.**
- **Energy audit studies in buildings have shown large potential for energy savings both in government and commercial office buildings. Study of the available data has shown that there is an urgent need for improved energy efficiency of buildings**
- **The move is aimed at accelerating the energy efficiency activities in commercial buildings across the country.**
- **This programme would rate the Buildings on a 1-5 Star scale with 5 Star labeled buildings being the most efficient.**
- **Five categories of buildings - office buildings, hotels, hospitals, retail malls, and IT Parks in five climate zones in the country have been identified for this programme.**
- **The scheme is currently invoked for two categories - Office Buildings and BPO Buildings.**

# STAR LABELING OF BUILDINGS - CONTD

- Initially, the programme targets the following 3 climatic zones for air-conditioned and non- air-conditioned office buildings:

**Warm and Humid**

**Composite**

**Hot and Dry**

- It will be subsequently extended to other climatic zones.
- To apply for rating of office buildings, a standardized format is developed for collection of actual energy consumption: data required includes building's built up area, conditioned and non-conditioned area, type of building, hours of operation of the building in a day, climatic zone in which building is located, and other related information of the facility

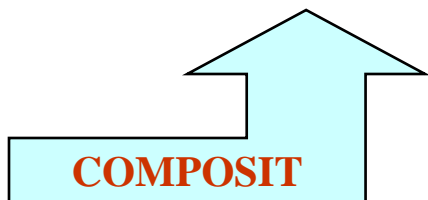
## STAR LABELING OF BUILDINGS - CONTD

- Those buildings having a connected load of 100 kW and above would be considered for BEE star rating scheme
- Energy Performance Index (EPI) in kWh / sqm/ year will be considered for rating the building.
- Buildings have been categorized into two, having air conditioned area greater than 50% and less than 50% of built up area.
- The Star rating Programme would provide public recognition to energy efficient buildings, thus create a demand for such buildings .

**TABLE OF BEE RATING FOR OFFICE BUILDING MORE THAN 50 % AIR CONDITIONED  
BUILD – UP- AREA.**

<b>EPI (KWH/SQ M/YEAR)</b>	<b>Star Label</b>
<b>190-165</b>	<b>1 Star</b>
<b>165-140</b>	<b>2 Star</b>
<b>140-115</b>	<b>3 Star</b>
<b>115-90</b>	<b>4 Star</b>
<b>Below 90</b>	<b>5 Star</b>

<b>EPI (KWH/SQ M/YEAR)</b>	<b>Star Label</b>
<b>200-175</b>	<b>1 Star</b>
<b>175-150</b>	<b>2 Star</b>
<b>150-125</b>	<b>3 Star</b>
<b>125-100</b>	<b>4 Star</b>
<b>Below 100</b>	<b>5 Star</b>



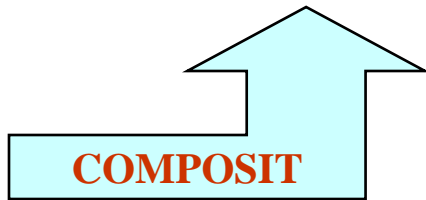
<b>EPI (KWH/SQ M/YEAR)</b>	<b>Star Label</b>
<b>180-155</b>	<b>1 Star</b>
<b>155-130</b>	<b>2 Star</b>
<b>130-105</b>	<b>3 Star</b>
<b>105-80</b>	<b>4 Star</b>
<b>Below 80</b>	<b>5 Star</b>



**TABLE OF BEE RATING FOR OFFICE BUILDING LESS THAN 50 % AIR CONDITIONED  
BUILD – UP- AREA.**

<b>EPI (KWH/SQ.M/YEAR)</b>	<b>Star Label</b>
<b>80-70</b>	<b>1 Star</b>
<b>70-60</b>	<b>2 Star</b>
<b>60-50</b>	<b>3 Star</b>
<b>50-40</b>	<b>4 Star</b>
<b>Below 40</b>	<b>5 Star</b>

<b>EPI (KWH/SQ.M/YEAR)</b>	<b>Star Label</b>
<b>85-75</b>	<b>1 Star</b>
<b>75-65</b>	<b>2 Star</b>
<b>65-55</b>	<b>3 Star</b>
<b>55-45</b>	<b>4 Star</b>
<b>Below 45</b>	<b>5 Star</b>



<b>EPI (KWH/SQ.M/YEAR)</b>	<b>Star Label</b>
<b>75-65</b>	<b>1 Star</b>
<b>65-55</b>	<b>2 Star</b>
<b>55-45</b>	<b>3 Star</b>
<b>45-35</b>	<b>4 Star</b>
<b>Below 35</b>	<b>5 Star</b>



# BEE STAR RATING FOR OFFICE BUILDINGS

Primary Data		Year
No.	Item	Value
1	Connected Load (kW) or Contract Demand (KVA)	565 KVA
2	Installed Capacity: DG/GG Sets (KVA or kW)	380 + 110+ 15
	Annual Electricity Consumption, purchased from utilities (KWH)	973569KWH
	Annual Electricity Consumption, through Diesel Generating ( DG)/ Gas Generating Set(s) (KWH)	25167 KWH
3	Total Annual Electricity Consumption Utilities + DG Sets/ GG Sets (KWH)	998736KWH
	Annual Cost of Electricity, purchased from Utilities	6351607
	Annual Cost of Electricity generated through+ DG/GG Sets ( Rs)	309603
4	Total Annual Electricity Cost Utilities + DG Sets/ GG Sets (Rs)	6661210
5	Area of the building (exclude parking, lawn, roads etc..)Built Up Area ( sqm)( Excluding Basement Area)	11038
	<ul style="list-style-type: none"> <li>• Conditioned Area (in Sqm)</li> </ul>	5533
	<ul style="list-style-type: none"> <li>• Conditioned Area( as % of built up area)</li> </ul>	50%
6	Working hours( eg. 5/6/7 days per week)	8 Hrs
7	Working days/ week ( eg. 5/6/7 days per week)	6 days
8	Office	
	Total No: of Employees	650
	Average no. of persons at any time in office during office hours	585
9	Installed capacity of Air Conditioning System (TR)	276.5 TR
10	Installed lighting load (KW) (if available)	55 KW
11	HSD ( or any other fuel oil used, specify)/ Gas consumption in DG / GG Sets in the year	NIL
12	Fuel used for generating steam /water heating in the year	
13	EPI(Energy Performance Index) in KWH/sq m / year. Energy includes electricity purchased and generated (Excluding electricity generated from any renewable resources)	90.4 KWH / sq m / year
14	Star label applied for	

I hereby declare that the building is fully occupied for the last one year and all the above furnished information is true in all respect.

# A CASE STUDY- REGIONAL TELECOM TRAINING CENTRE

## INTRODUCTION

Regional Telecom Training Centre, Thiruvananthapuram is the second oldest training Centre of the erstwhile P&T Department and the present BSNL in the country. It was founded on 6th



Total Ground covered area constitutes only 24.75% of the campus. Green cover constituting 50% of the campus acts as natural carbon sink, thereby ensuring pure air quality. Two water bodies, help in retaining the water table and enhancing the overall environment.



Area of the campus	1,15,106 M <sup>2</sup> (28.39 Acre )	100%
Green Area	51,799 M <sup>2</sup> (12.78 Acre)	45%
Water body Area	9210 M <sup>2</sup> (2.27 Acre)	8%
Garden Area	6906 M <sup>2</sup> (1.7 Acre)	6%

# BUILDING BLOCKS

The design of the building blocks and the material selection for construction, coupled with the natural settings all around had contributed greatly in reducing the energy demand.

Construction materials used for majority of buildings, like natural stones for walls, and tiles for roof supplemented by design aimed at enhanced ventilation help to reduce ingress of heat. All buildings are more airy with ample scope for natural light and free air flow



# MEASURES ADOPTED

Solar Water Heater for Officer's Hostel Block



Energy savings realised : Rs 0.0139 MU  
Total cost Savings : Rs 98000/-

Solar Water Heater for Hostel Block I & II



Energy savings realised : Rs 0.0261 MU  
Total cost Savings : Rs 1,30,000/-

## RAINWATER HARVESTING

Extensive rain water harvesting system in the campus ensures that the entire run off water are utilised most effectively for cleaning and miscellaneous purposes, allowing the rest to collect and recharge the whole campus.



Natural Water Body  
Sustenance of Eco  
system



# MEASURES ADOPTED

## Eco friendly energy

Two Bio-gas plants, render the waste disposal in a very eco friendly way. Two derivatives of the anaerobic digestion process, non-polluting biogas and enriched organic manure, help us in supplementing the cooking gas and acting as feed to the plants.



**e-campus:** An e-campus site was launched for online collaboration of various resources including staff and trainees. This has helped in reducing the paper work and disseminating information and knowledge faster.



**Vigorous awareness campaign:** Vigorous publicity campaign through eye-catching posters stuck at vantage points of the institute. Trainees are getting hooked to the slogans.



# MEASURES & SAVINGS ACHIEVED

<b>Project Description</b>	<b>Saving</b>	
	<b>Electricity (KWh)</b>	
<b>Energy Efficient lighting</b>	<b>8400</b>	
<b>e-Campus</b>	<b>52</b>	
<b>Tapping of untapped water sources of the campus thereby reducing usage of Municipal water:</b>	<b>920</b>	
<b>Bio-Gas Plant (25 M<sup>3</sup> Cap)</b>	<b>44000</b>	<b>Electrical Equivalent</b>
<b>Solar powered street light:</b>	<b>260</b>	
<b>Rain water harvesting:</b>	<b>7200</b>	
<b>Weeding out obsolescent labs &amp; Equipments</b>	<b>10950</b>	
<b>Replacement of Power plant:</b>	<b>8200</b>	
<b>Replacement of Inefficient and life expired AC units:</b>	<b>56700</b>	
<b>Solar water heaters in CTTC hostel:</b>	<b>63000</b>	
<b>Replacement of Fl.lamp fittings with CFL</b>	<b>8000</b>	
<b>Vigorous awareness campaign:</b>	<b>Not measurable</b>	

## POSSIBILITIES OF GOING GREEN IN EXISTING BUILDINGS- OTHER MEASURES

- **FREE COOLING** in the area where Temperature is low.
- **Insulating the walls and ceilings** , exposed to direct sun with appropriate insulating material.
- **Usage of LED lamps**, substituting Neon/ Incandescent lamps.
- **Usage of Level controllers** in all Pumps.
- **Light Sensor controlled switching ON/ OFF** of compound lights.





**THANK YOU**