# ENERGY CONSERVATION ACT - 2001

# MANDATORY PROVISIONS APPLICABLE TO INDUSTRY INCLUDING ENERGY AUDIT


PRESENTATION BY

S.B. SADANANDA
DIRECTOR (ENERGY MANAGEMENT)
NATIONAL PRODUCTIVITY COUNCIL
MUMBAI.

K.K.CHAKARVARTI
ENERGY ECONOMIST
BUREAU OF ENERGY EFFICIENCY
NEW DELHI (INDIA)


SEMINAR ON

## ENERGY CONSERVATION & CARBON TRADING

ORGANIZED BY

## INDIAN CHEMICAL COUNCIL

MUMBAI, 3 & 4 NOVEMBER 2006

# INTRODUCTION

- In a rapidly growing economy of India, the energy requirements have been increasing at a very fast pace
- The Government of India at the highest level is giving top priority to the attainment of nation's long-term energy security.
- India ranks 5th in the world in terms of primary energy consumption, accounting for about 3.5% of the world commercial energy demand in the year 2003.
- While it is essential to add new power generation capacity as well as ensure availability of substantial commercial fuels to meet the nation's growing energy requirements, it is equally important to look out for options that help in reducing energy demand by various end-use sectors.
- The need for enhancing energy efficiency efforts has become very important.

# INDIA'S ENERGY DEMAND AND SUPPLY

- Per capita consumption of energy in India is one of the lowest in the world.
- India consumed 439 kg of oil equivalent (kgoe) per person of primary energy in 2003 compared to the world average of 1688.
- India's energy use efficiency for generating Gross Domestic Product (GDP) in Purchasing Power Parity (PPP) terms is better than the world average
- However, it is 7% to 23% higher than Denmark, UK, Japan and Brazil.
- Per capita consumption of electricity in India is about 615 kWh which is only 20% of the world average.
- The per capita consumption is targeted to grow to about 1000 kWh per year by 2012
- By 2031-32, power generation capacity must increase to nearly 800,000 MW from the current capacity of around 160,000 MW inclusive of all captive plants
- Similarly requirement of coal, the dominant fuel in in India's energy mix will need to expand to over 2 billion tonnes / annum

# IMPORTANCE OF ENERGY EFFICIENCY

- Energy efficiency/conservation measures can reduce peak and average demand.
- Investment in energy efficiency/energy conservation is highly cost effective.
- Can be achieved less than US$ 0.22 million/MW
- Also mitigates GHG emissions and avoids investment in fuel, mining, transportation etc.
- Keeping the above factors in view and also to provide energy policy guidance,Government of India enacted the Energy Conservation Act,2001

# THE ENERGY CONSERVATION ACT- ESTABLISHMENT OF INSTITUTIONAL FRAMEWORK

- EC Act enacted in October 2001
- Become effective from 1st March 2002
- Bureau of Energy Efficiency (BEE) operationalized from 1st March 2002.
- Energy efficiency institutional practices and programs in India are now mainly being guided through various voluntary and mandatory provisions of the Energy Conservation Act

## MISSION OF BEE

***Develop policy and strategies with a thrust on self regulation and market principles, within the overall framework of the EC Act with the primary objective of reducing energy intensity of the Indian economy.***

# BEE ACTION PLAN

- The Bureau has drawn up various energy efficiency programs and formulated an Action Plan, which was released to the nation by the Prime Minister in August 2002.

- 10 thrust areas of BEE Action Plan covering voluntary and mandatory provisions of the Energy Conservation Act 2001 are :
  1: Indian Industry Program for Energy Conservation
  2: Demand Side Management
  3: Standards & Labeling program
  4: Energy efficiency in buildings
  5: Energy Conservation Building Codes
  6: Professional Certification and Accreditation
  7: Manuals and Codes
  8: Energy Efficiency Policy Research Program
  9: School Education
  10: Establishments of delivery mechanisms for Energy Efficiency services
- BEE initiated various programs and activities during the year 2002-06 to meet the commitment as laid out in the Action Plan.

# IMPORTANT FEATURES OF INDIAN ENERGY CONSERVATION ACT AND BEE ACTION PLAN

## 1. STANDARDS AND LABELING

*( A programme initially to focus on energy policy issues of energy efficiency improvement in unorganized sectors such as domestic and agriculture sectors through improvement of designed energy efficiencies of energy consuming appliances and providing this information on comparative basis in the form of energy labels )*

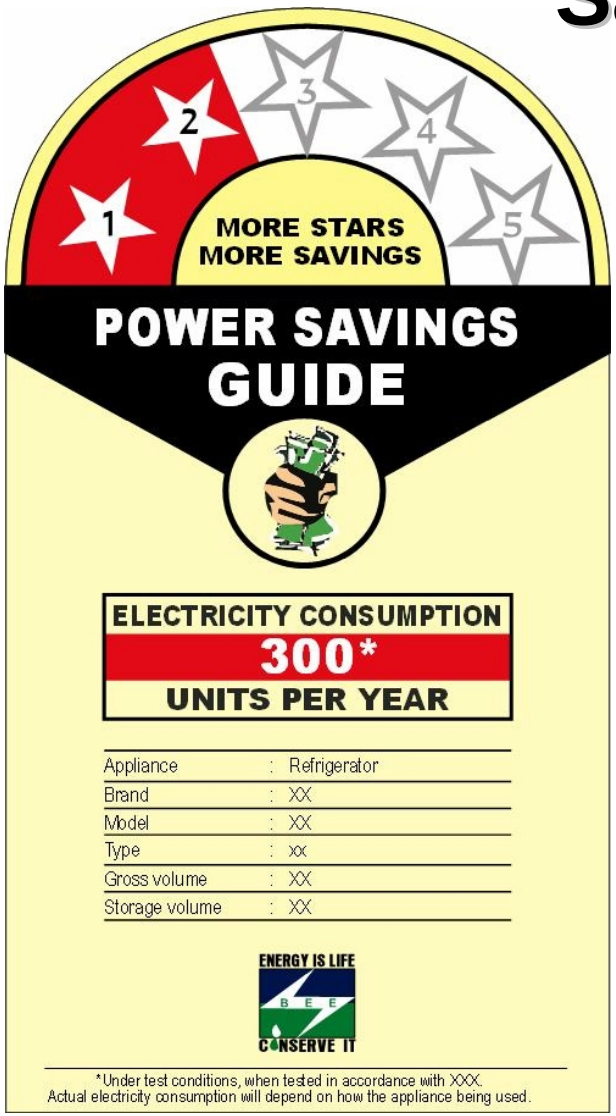
- **Evolve minimum energy performance standards(MEPS) for notified equipment and appliances**
- **Prohibit manufacture, sale and import of equipment and appliances not confirming to MEPS**
- **Introduce Energy labeling to enable consumers to make informed choice**

# Standards & Labeling Programme -(contd.)

- Energy labeling Rating plans for agricultural pump sets, general purpose electric motors, distribution transformers, fluorescent tube lights, refrigerators and air conditioners have been prepared after detailed interaction with manufactures and other stakeholders.

- Identified equipment have been tested for energy performance and engineering economic studies carried out for arriving at Minimum Energy Performance Standards

# Sample Labels




## Refrigerator


## Tubular Fluorescent lamp

# Launching of Standards & Labeling Programme

- The National Energy Labeling Programme has been launched by Union Minister of Power on 18th May, 2006.

- To begin with house-hold refrigerators (no frost) and fluorescent tube lights (4 feet) have been included in the programme on voluntary basis.

- Other appliances/equipment, such as direct cool refrigerators, general purpose electric motors, window air-conditioners and ceiling fans are also planned to be launched in 2006-07.

# Standards & Labeling Programme -(contd.)

**In India:**

- **Refrigerators & air-conditioners segment has been growing at a rate of 15-20% / year for the last 3 years.**
- **Lower prices, availability of easy finance, higher disposable income and the urge for better living has all combined to help this growth.**
- **Initial estimates show a cumulative GHG emissions reduction potential of**
- **96 Million Tons of $CO_2$ through air-conditioners**
- **299 Million Tons of CO2 through refrigerators over a 15-year period (2006-2020)**

# Launch of National Energy Labeling Programme

*(An initiative aimed at efficient consumption of energy)*

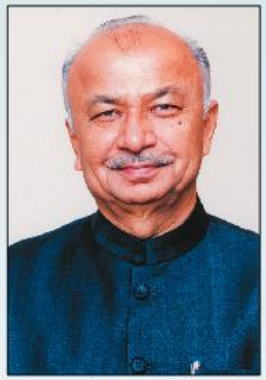
at the hands of

## Achievements

- 311 industrial establishments saved Rs. 989 Crores on energy cost in 2004-05
- Energy worth Rs. 4000 Crores saved by the participating industries of National Energy Conservation Awards during 1999-2005
- 880 MW power saved by adoption of energy efficient CFLs and Tube lights during 2002-05
- Over 20% reduction in electricity consumption achieved in four prestigious central government buildings
- Sale of Compact Fluorescent Lamps (CFL) increased from 18 million in 2002 to 57 million in 2005

## Schedule for launching Energy Labeling

- Frost Free Refrigerators: May, 2006
- Fluorescent Tube Lights: May, 2006
- Direct Cool Refrigerators: September, 2006
- General Purpose Electric Motors: October, 2006
- Air Conditioners: November, 2006
- Ceiling Fans: December, 2006



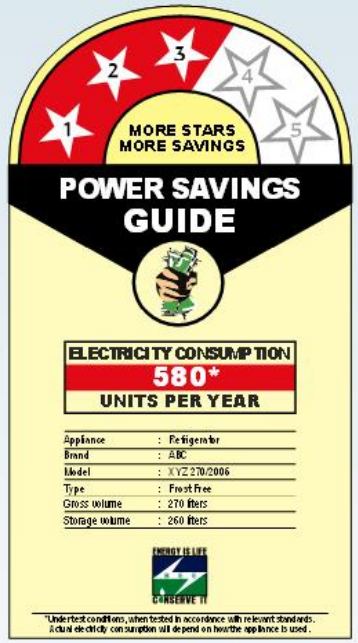
**Shri Sushilkumar Shinde**
Hon'ble Union Minister of Power

**18th May, 10:00 am, Stein Auditorium,**
**India Habitat Centre, Lodhi Road, New Delhi - 110003.**

*Shri R. V. Shahi*
Secretary (Power)
Govt. of India

*Shri V. S. Verma*
Director General
Bureau of Energy Efficiency

## BEE LABEL




सत्यमेव जयते
Ministry of Power
Government of India

The next time you buy a frost free refrigerator or a tube light, look for the BEE label. BEE label rates the appliances on energy efficiency - the most energy efficient product gets 5 Stars and the least one gets 1 Star. It helps you make an informed choice, and cut down your electricity bill.

BEE labeled products are expected to be available in the market from July 2006.

ENERGY IS LIFE
B E E
CONSERVE IT
Bureau of Energy Efficiency
Ministry of Power, Govt. of India
www.bee-india.nic.in

SAVE ENERGY FOR BENEFIT OF SELF & THE NATION

# 2. DESIGNATED CONSUMERS

*( A programme to initially focus on energy policy issues of energy efficiency improvement in organized sectors such as energy intensive industries and commercial sector through establishment of energy management system, capacity building of energy professionals, implementation of energy audits, establishments of specific energy consumption norms and support to consumers on providing information on authentic energy data )*

- **Schedule to EC Act provides list of 15 energy intensive industries and other establishments to be notified as designated consumers (DC). DCs to**
  - **Appoint or designate energy managers**
  - **Get energy audits conducted by accredited energy auditors**
  - **Implement techno-economic viable recommendations**
  - **Comply with norms of specific energy consumption fixed**
  - **Submit report on steps taken**

# List of Energy Intensive Industries and other establishments specified as designated consumers

1. Aluminium;
2. Fertilizers;
3. Iron and Steel;
4. Cement;
5. Pulp and paper;
6. Chlor Akali;
7. Sugar;
8. Textile;
9. Chemicals;
10. Railways;
11. Port Trust;
12. Transport Sector (industries and services);
13. Petrochemicals, Gas Crackers, Naphtha Crackers and Petroleum Refineries;
14. Thermal Power Stations, hydel power stations, electricity transmission companies and distribution companies;
15. Commercial buildings or establishments;

# Designated Consumers –(contd.)

- Draft Specific energy consumption norms for Cement and Paper & Pulp sectors have been developed
- Specific Energy Consumption norms finalization for two more sectors, namely Fertilizers and Chlor-alkali has been undertaken
- India is the only country to attempt to evolve mandatory absolute specific energy consumption norms for energy intensive industries under the Energy Conservation Act 2001 and regulate the market
- The principle of relative specific energy consumption norms, i.e annual % improvement based on a given as is situation in an enterprise is a more feasible option and may be more effective

# Designated Consumers – (contd.)

- To strengthen the energy management and energy auditing capabilities in the country, 3 National Certification examinations for Energy Managers and Energy Auditors have been successfully conducted in 2004, 2005 and 2006 respectively in 23 centers all over the country.

- 512 Certified Energy Managers and 1156 Certified Energy Auditors are in place from the first and second certification examinations

- 64 energy auditing agencies have been accredited on the bases of their energy auditing capabilities and institutional set up.

- Accredited Energy Auditors have carried out about 3000 energy audits on voluntary basis in the last 3 financial years (2003-06).

# State wise data on number of qualified Certified Energy Managers and Certified Energy Auditors of 1st and 2nd National Certification Examination - 2004 & 2005

| Name of the State | Main Examination 2004 | | Main Examination 2005 | | Supplementary Examination 2005 | | Sub Total | |
|---|---|---|---|---|---|---|---|---|
| | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors |
| Andhra Pradesh | 16 | 28 | 9 | 23 | 1 | 12 | 26 | 63 |
| Arunachal Pradesh | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| Assam | 9 | 2 | 2 | 3 | 1 | 2 | 12 | 7 |
| Bihar | 4 | 2 | 1 | 2 | 0 | 2 | 5 | 6 |
| Chattisgarh | 2 | 9 | 1 | 9 | 0 | 7 | 3 | 25 |
| Daman | 0 | - | 0 | 0 | 0 | 0 | 0 | 0 |
| Goa | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 6 |
| Gujarat | 53 | 50 | 28 | 52 | 7 | 26 | 88 | 128 |
| Haryana | 11 | 15 | 1 | 18 | 2 | 12 | 14 | 45 |
| Himachal Pradesh | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Jammu & Kashmir | - | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Jharkhand | 1 | 7 | 0 | 1 | 1 | 0 | 2 | 8 |
| Karnataka | 3 | 20 | 3 | 9 | 2 | 8 | 8 | 37 |
| Kerala | 12 | 24 | 3 | 9 | 2 | 11 | 17 | 44 |

# State wise data on number of qualified Certified Energy Managers and Certified Energy Auditors of 1st and 2nd National Certification Examination - 2004 & 2005 – Contd.

| Name of the State | Main Examination 2004 | | Main Examination 2005 | | Supplementary Examination 2005 | | Sub Total | |
|---|---|---|---|---|---|---|---|---|
| | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors | Energy Managers | Energy Auditors |
| Madhya Pradesh | 24 | 23 | 5 | 16 | 3 | 26 | 32 | 65 |
| Maharashtra | 67 | 113 | 34 | 100 | 10 | 75 | 111 | 288 |
| Meghalaya | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Delhi | 5 | 17 | 3 | 23 | 3 | 29 | 11 | 69 |
| Orissa | 3 | 12 | 1 | 16 | 2 | 3 | 6 | 31 |
| Pondicherry | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 3 |
| Punjab | 7 | 7 | 3 | 7 | 0 | 3 | 10 | 17 |
| Rajasthan | 24 | 21 | 6 | 20 | 0 | 19 | 30 | 60 |
| Tamil Nadu | 55 | 52 | 7 | 25 | 4 | 16 | 66 | 93 |
| Union Territory (Chandigarh) | - | 2 | 0 | 5 | 0 | 2 | 0 | 9 |
| UT of D & NH | 3 | - | 0 | 1 | 0 | 0 | 3 | 1 |
| Uttar Pradesh | 27 | 32 | 7 | 31 | 4 | 33 | 38 | 96 |
| Uttaranchal | 1 | 2 | 2 | 1 | 0 | 4 | 3 | 7 |
| West Bengal | 20 | 25 | 3 | 13 | 0 | 5 | 23 | 43 |
| Others | - | 2 | 0 | 2 | 0 | 0 | 0 | 4 |
| **Total** | **350** | **468** | **120** | **391** | **42** | **297** | **512** | **1156** |
| **Grand Total** | **1668** | | | | | | | |

# ENERGY EFFICIENCY IMPROVEMENT AND REDUCTION OF GREEN HOUSE GAS EMISSIONS

- **Energy Efficiency Improvement is one of the principal steps in reducing green house gas emissions.**
- **Energy Efficiency Projects in chemical and petro chemical industries have good potential to qualify as CDM projects.**
- **A comprehensive energy audit would enable identifying many retrofit and new projects centered around energy efficiency improvements and also opportunities for switching to less carbon intensive fuel. As the coverage in energy audit is quite exhaustive. It would also enable identifying those process areas where, in-process $CO_2$ generation could be productively reutilized.**


ENERGY IS LIFE

BEE

CONSERVE IT