

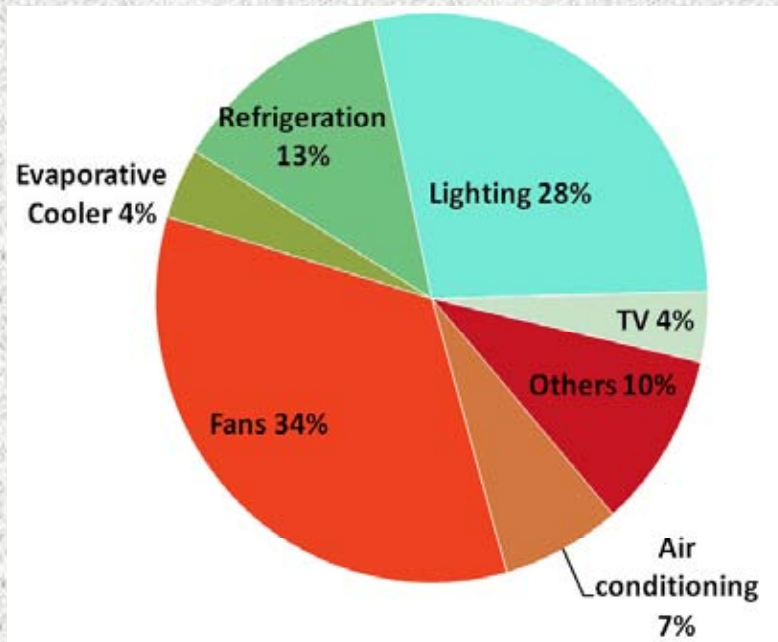
# **Energy Efficiency Initiatives in Commercial Buildings**

**Bureau Of Energy Efficiency  
Ministry of Power  
Government of India**

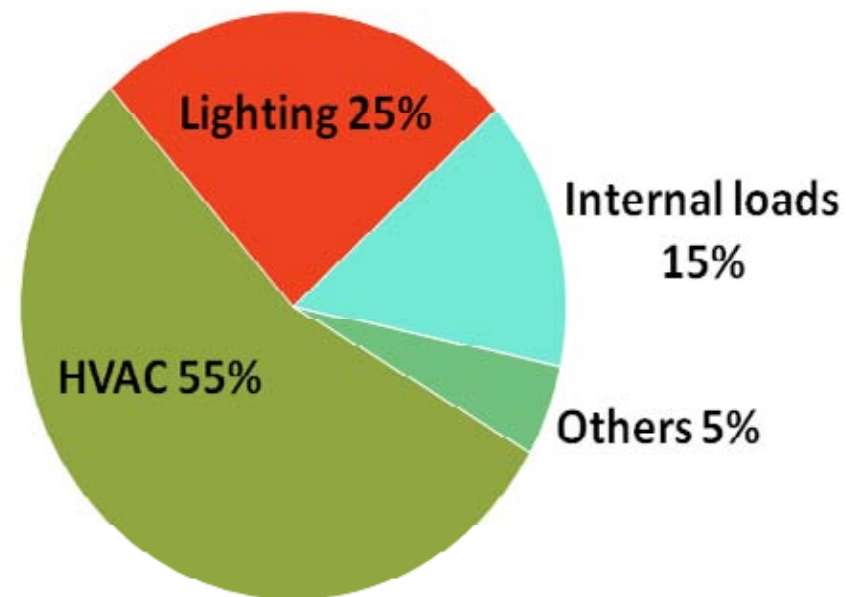
# Need for Building Energy Efficient Cities in India?

- In 2020 almost **500 Million people will be living in Urban India**
- Cities have a central role to play in the reduction of CO<sub>2</sub> emissions and the fight against climate change.
- Cities can mitigate climate change by reducing energy consumption in the construction, maintenance and refurbishment of buildings.
- Building sector contribution to overall electricity consumption has grown from **15% in 1970-71 to 34% in 2010-11** and therefore offers cost-effective opportunity for savings.

# Electricity Consumption comparison between Commercial and Residential Buildings



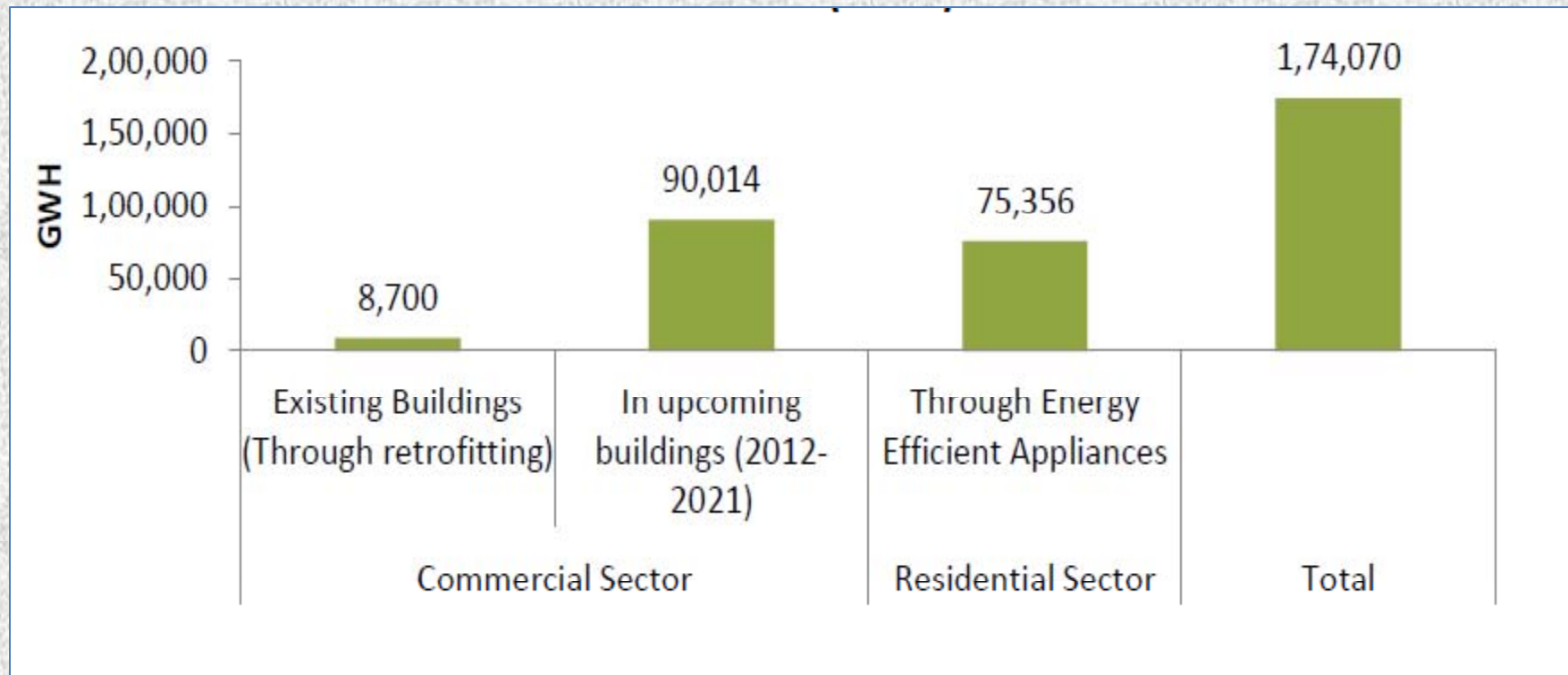
**Electricity Consumption Pattern in Residential Buildings**



**Electricity Consumption Pattern in Commercial Buildings**



# Estimated Electricity Saving Potential of Building Stock (2021)



Source: World Bank Study

# Projected growth in Floor Space & Energy Consumption-‘Business as Usual’ scenario

Year	Floor space (mil. sq.m)	Energy consumption (BU)
2005	425	36
2012	745	166
2017	1114	240

Source :“Interim Report of the Expert Group on Low Carbon Strategies for inclusive Growth” – Planning Commission

# Policy/ Regulatory Framework for New Buildings

## Design Standards NBC/ Municipal Building bye- laws

- Ensures Comfort
- Ensures Safety
- Attempts but doesn't ensure energy efficiency

## Energy Standard

- Energy Conservation Building Code

## Linkage of NBC with ECBC

Harmonization of ECBC with NBC 2005 has been finalized by including a chapter "Approach to Sustainability" which would be adopted in all future constructions in the country.



# Energy Conservation Building Code

- ECBC has been developed as a voluntary code for all new commercial building having a connected load of 100 kW and above. ECBC provided minimum performance standards for following components :
  - Building Envelope (Walls, Roofs, Windows)
  - Lighting (Indoor and Outdoor)
  - Heating Ventilation and Air Conditioning (HVAC) System
  - Solar Hot Water Heating
  - Electrical Systems
- Voluntary introduction of ECBC in May 2007; mandatory after capacity building and implementation experience
- **While the ECBC has been developed by BEE, its enforcement lies with the State governments and urban local bodies through notification within their states as per their regional requirements.**

# Status of States for ECBC Implementation

S. No.	Update Status	Name of States/UTs
1	States where ECBC has been <b>notified in 11<sup>th</sup> plan period</b>	Rajasthan and Odisha
2	States which have amended ECBC for their state in 11 <sup>th</sup> plan period	Uttar Pradesh, Kerala, Gujarat, Tamil Nadu and Haryana
3	States where ECBC has been <b>notified in 12<sup>th</sup> plan period</b>	Uttarakhand, Andhra Pradesh, Punjab, Karnataka & UT of Puducherry
4	States which have amended ECBC for their state in 12 <sup>th</sup> plan period	Chhattisgarh, Maharashtra West Bengal, Himachal Pradesh, Bihar and Madhya Pradesh
5	States which are targeted to notify ECBC by the end of 12 <sup>th</sup> plan period	All states



# Support provided to states

## ➤ ECBC Building Design

- Create a cadre of ECBC certified professionals
- Pool of Master Trainers through 'Train the Trainer'

## ➤ ECBC Compliance

- Web Based Tools for compliance checks
- Cadre of independent ECBC certified professionals to be used as verifiers
- Checklist of interventions necessary for compliance
- Verification at design, construction and completion levels
- Rules to support enforcement

# Targets for 12<sup>th</sup> Plan Period

## **Objective:**

- 75 % of all new starts of commercial buildings are ECBC compliant
- 20% of the existing commercial buildings reduce energy consumption through retrofits

## **Instruments:**

- Adoption of ECBC by states
- Integration of ECBC within building bye-laws
- Capacity building of states for ECBC implementation
- Demonstration projects
- Availability of energy efficient material to support implementation
- Declaration of certain building categories as designated consumers
- Extension of Star Rating Scheme for other categories of buildings
- Implementation of retrofits in existing buildings

## **Outcome:**

- Energy saving of 5.07 BU from commercial buildings



# Policy Framework for Existing Buildings

## Voluntary BEE Star Rating for Buildings

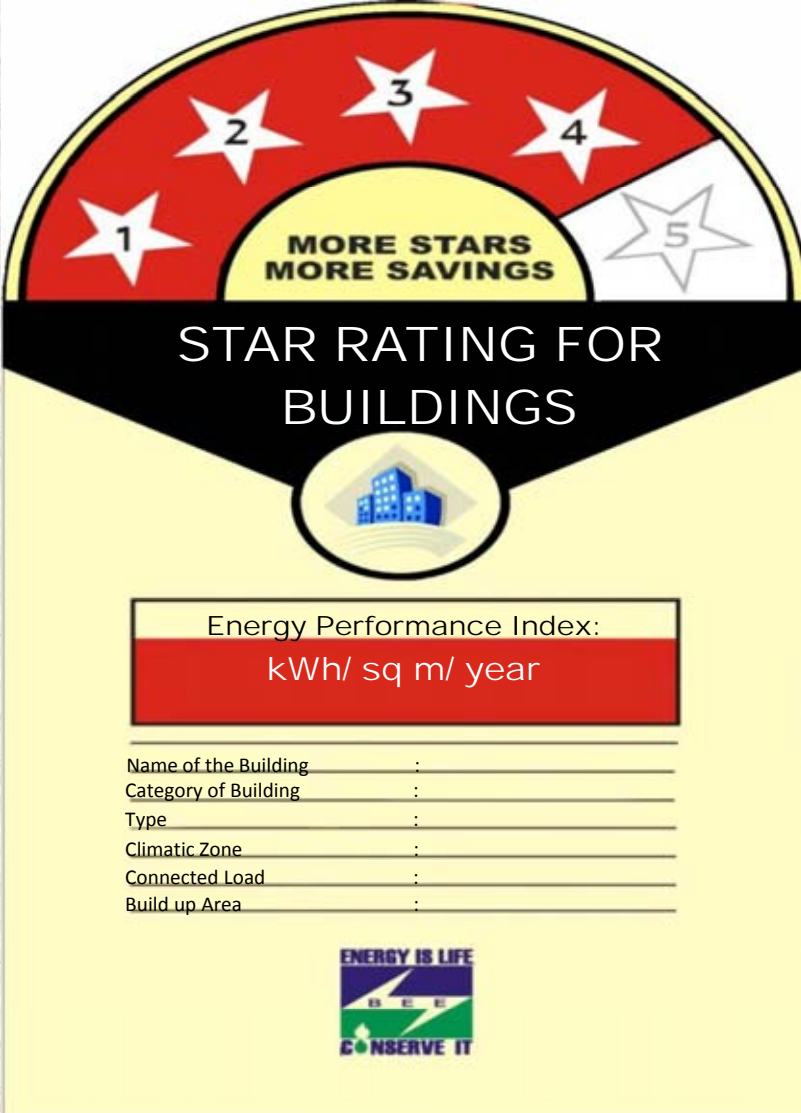
- **Star Rating Program** for buildings based on actual performance in terms of specific energy usage (kWh/sq m/year). Applicable for 3 categories of buildings i.e Day Use Office buildings, BPO & Shopping Malls

## Investment Grade Energy Audits of Public Buildings

- captures various energy efficiency measures based on economic analysis of energy efficiency measures that bring about energy savings due to reduced energy consumption



# Label for Buildings



The label is a semi-circular badge with a red upper half and a yellow lower half. The red half contains five white stars numbered 1 to 5 from left to right. The yellow half contains the text 'MORE STARS MORE SAVINGS' and a small icon of a building. Below the badge, the text 'STAR RATING FOR BUILDINGS' is written in a black banner. Below the banner is a small circular icon of a building. Below the icon is a red box containing the text 'Energy Performance Index: kWh/ sq m/ year'. Below the box are six lines for building information: Name of the Building, Category of Building, Type, Climatic Zone, Connected Load, and Build up Area. At the bottom is the BEE logo with the text 'ENERGY IS LIFE' and 'CONSERVE IT'.

1 2 3 4 5

MORE STARS  
MORE SAVINGS

STAR RATING FOR  
BUILDINGS

Energy Performance Index:  
kWh/ sq m/ year

Name of the Building :  
Category of Building :  
Type :  
Climatic Zone :  
Connected Load :  
Build up Area :

ENERGY IS LIFE  
BEE  
CONSERVE IT

## Bandwidths created

- Day Use Office
- BPO
- Shopping malls

## Future coverage

- Hospitals
- Hotels

# Activities under bilateral programmes

## Indo - US PACE D

Institutional Capacity Building for Administration, Enforcement & Implementation of ECBC  
ECBC Technical Update and promotion & facilitation of Net-Zero Energy Buildings (NZEBs) of demo projects  
Certification examination process for ECBC

## Indo - Swiss BEEP

Energy efficiency advisory for select commercial projects through IDP charrettes  
Developing insulation material testing protocols, lab capacities etc.  
Guidelines, labels and tools for residential & public buildings  
Capacity building through training programs & knowledge products

## UNDP GEF BEE

Training programme for design professionals  
Demonstration project for ECBC Implementation  
Building material test facilities and augmenting the capacities of existing labs  
Development of fiscal and financial incentive policies

***Thank You***

[www.bee-india.nic.in](http://www.bee-india.nic.in)