

# Scenario of Energy Conservation Building Code (ECBC) in India



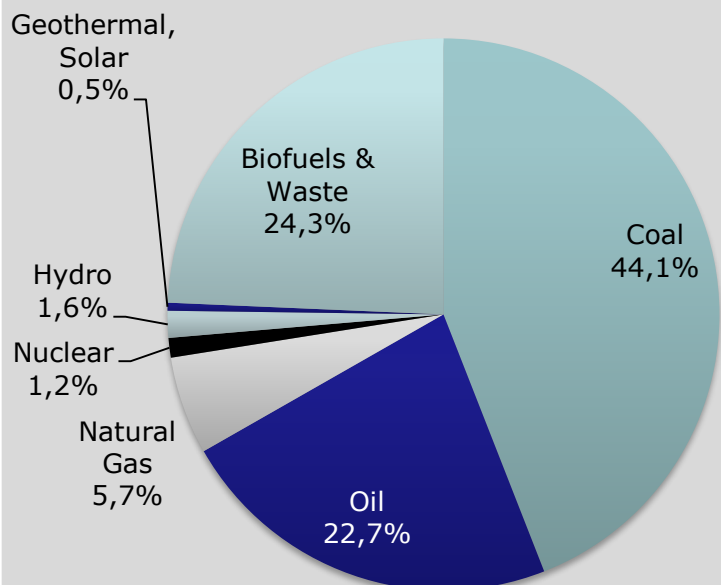
September 2017  
New Delhi

Saurabh Diddi  
Director  
Bureau of Energy Efficiency

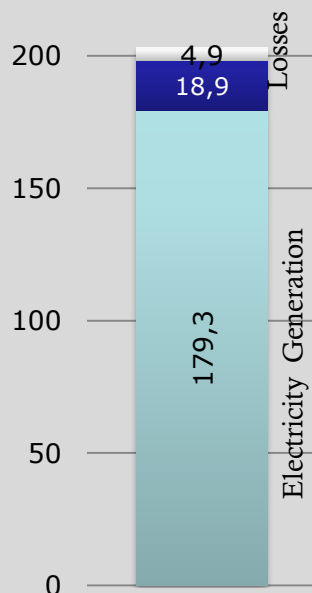
# Indian Energy Profile



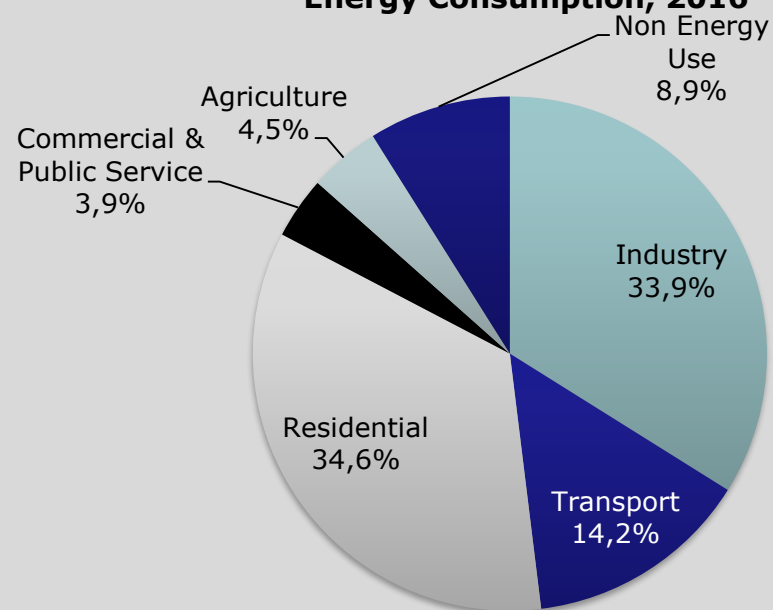
**Total Primary Energy Supply, 2016  
(About 800 million toe)**



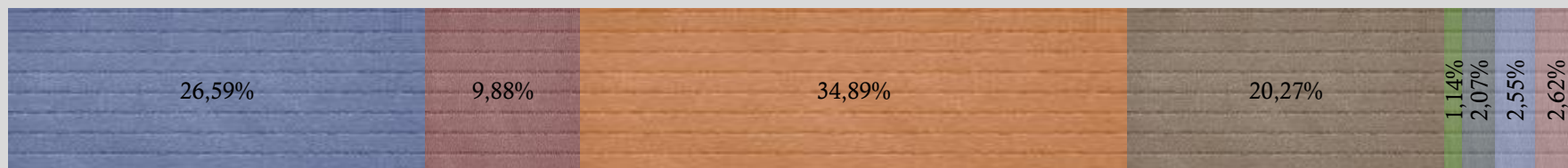
**Transformation Losses (mtoe)**



**Energy Consumption, 2016**



**Electricity Consumption - 1150 BU (2016)**

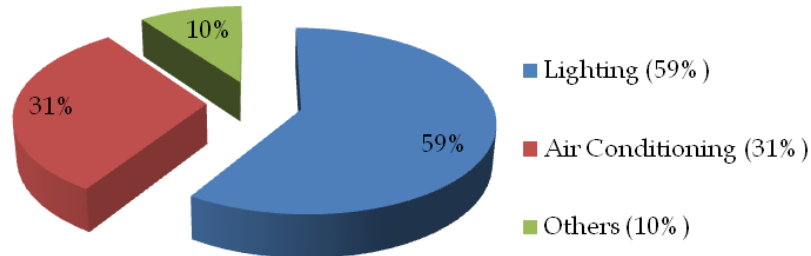


■ Domestic ■ Commercial ■ Industry ■ Agriculture ■ Public Lighting ■ Traction ■ Public Works ■ Misc

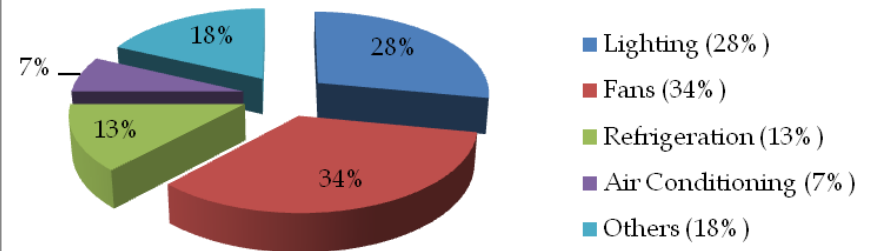
# Typical Electricity Use in Buildings



## Electricity Consumption in Commercial Sector



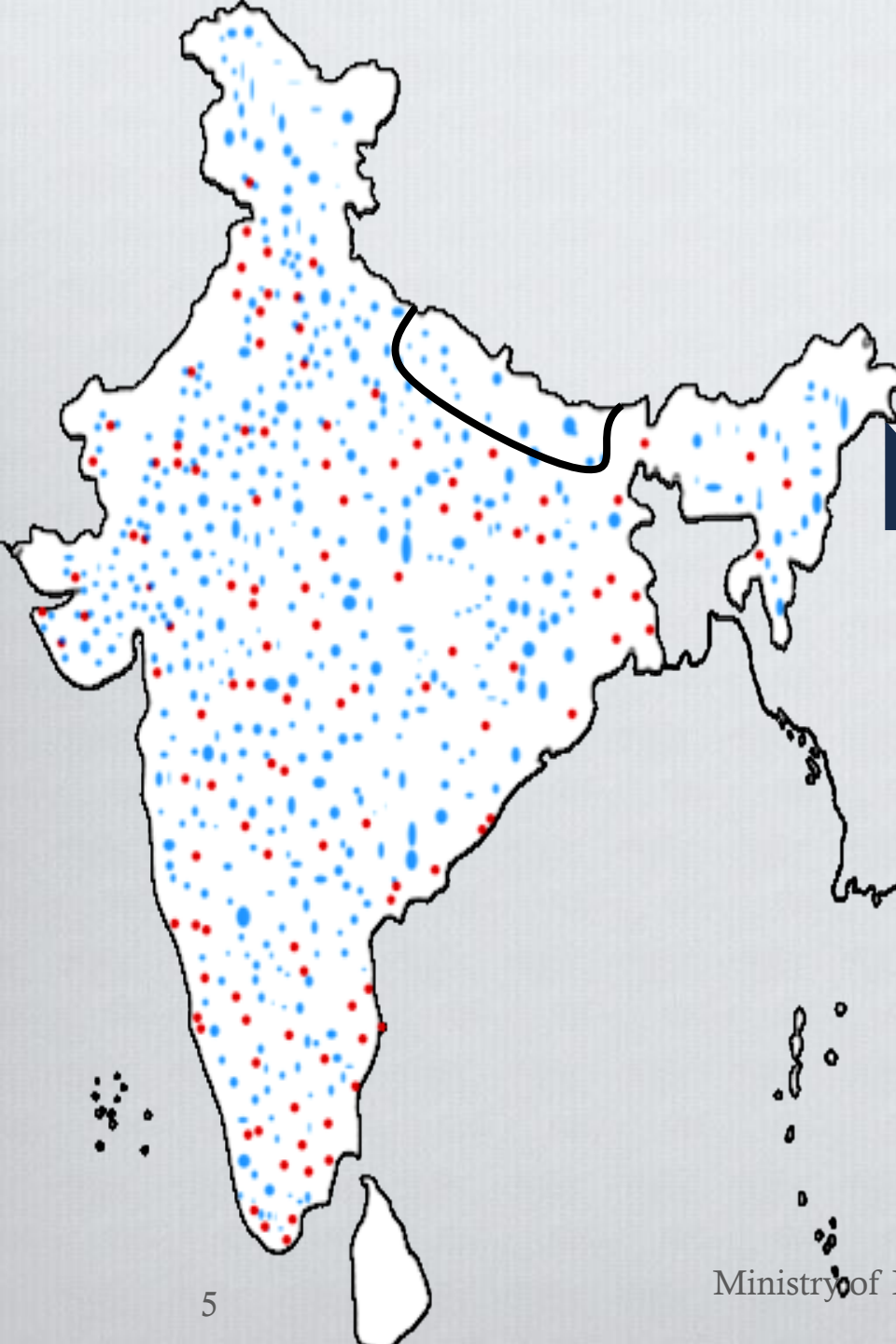
## Electricity Consumption in Residential Sector



- ◆ Application of building codes reduces electricity consumption by 25% - 30%
- ◆ Urbanization and aspiration of consumers will increase air conditioning demand



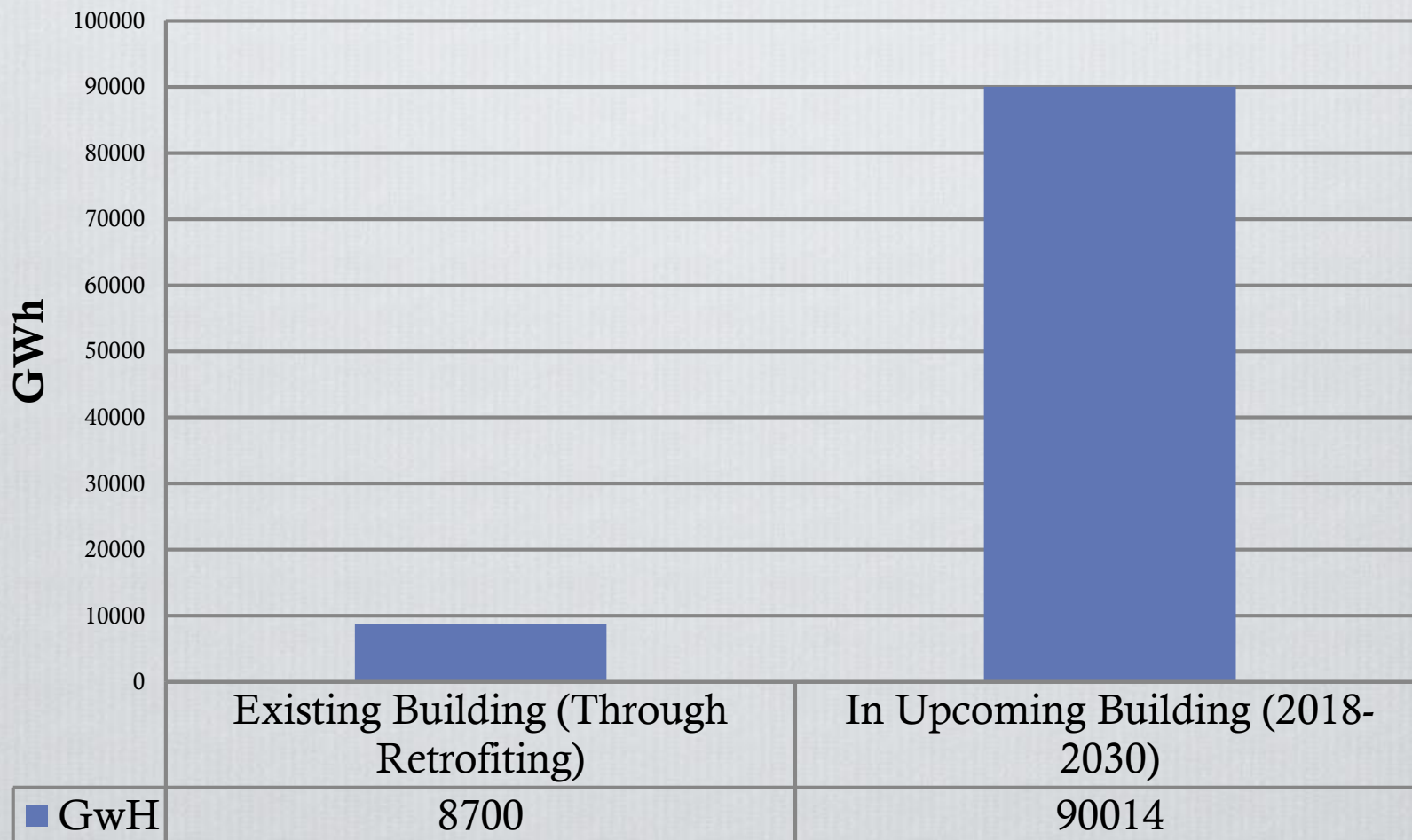
India is  
Growing



Over **2000**  
New Growth  
From  
Centers by  
**~400 Towns**  
**2050**  
and Cities in  
**2015**

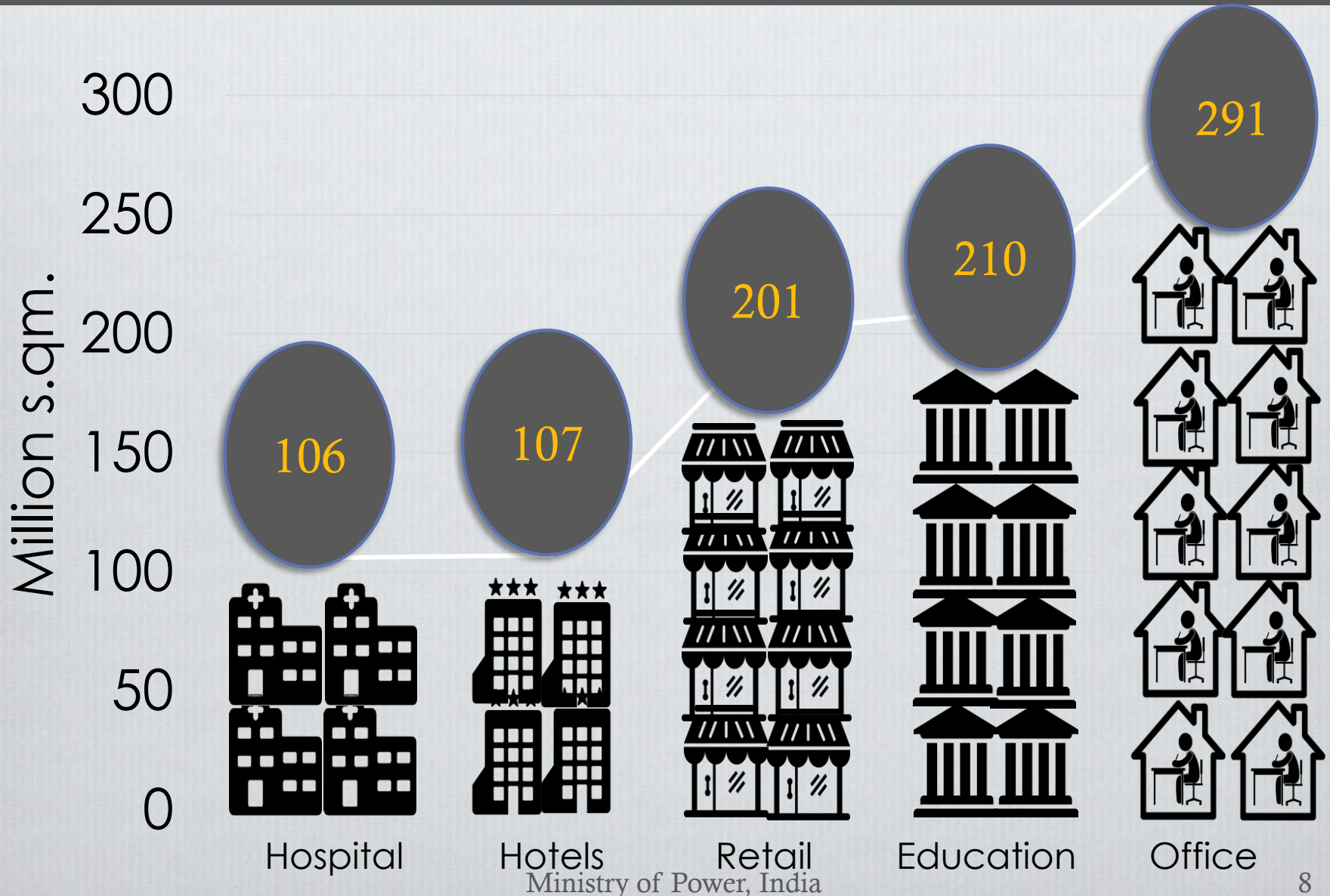


# Energy Savings Potential



India will add  
**1 Billion m<sup>2</sup>**  
of New  
Commercial  
Buildings by 2030

# Large Stock of Commercial Buildings in 2030





# Government of India Initiatives



## ◆ Commercial Buildings

- ◆ Energy Conservation Buildings Codes for New Buildings
- ◆ Super ECBC in States
- ◆ Labeling of Existing Buildings
- ◆ Energy Efficiency Retrofits in Existing Buildings
- ◆ Energy Efficient Components (Appliances & Material)
- ◆ Building Passport (New Scheme)

## ◆ New Residential Buildings

- ◆ New Code for Residential Buildings
- ◆ Building Passport

# ECBC – Status of adoption by States



- ◆ **Section 15** – Powers of State Government
- ◆ **Amend ECBC to suit regional and local climatic** conditions and may, by rules made by it specify and **notify ECBC** with respect to use of energy in the buildings.
- ◆ **Section 18** – Power of Central Government or State Government
- ◆ Central Government or State Government may issue directives for efficient use of energy and its conservation

*States have used the powers under EC Act to notify/ issue directives for ECBC*

*Notification can also be done through amendments in local (municipal) building bye-laws*

# Energy Conservation Building Code



- ◆ ECBC
  - ◆ minimum energy efficiency standards
  - ◆ Applicable to large commercial buildings
  - ◆ (connected load of 100 kW/contract demand of 120 kVA and above)
- ◆ ECBC prescribes standards for:
  - ◆ Building Envelope (Walls, Roofs, Windows)
  - ◆ Lighting (Indoor and Outdoor)
  - ◆ Heating Ventilation and Air Conditioning (HVAC) System
  - ◆ Solar Hot Water Heating
  - ◆ Electrical Systems

*While ECBC developed at Central level by BEE, its enforcement lies with the States*

*Ministry of Urban Development developed generic building bye-laws and advisory circulated to include in bye-laws*

S.no	State/UT	ECBC Amendm ent	ECBC Notificat ion	Notification in state bye-laws	Notificati on at Municipal ities	Enforce ment	Sched ule of Rates - PWD	ECBC Cell	Training & Capacity Development	Energy Simulation Software
1	Andhra Pradesh	✓	✓					✓	✓	*
2	Arunachal Pradesh	✓							✓	
3	Assam	✓						✓		
4	Bihar	✓						EU		*
5	Chandigarh UT							✓		
6	Chhattisgarh	✓						✓	✓	✓
7	NCT of Delhi	✓						✓		*
8	Goa							✓		
9	Gujarat	✓						✓		
10	Haryana	✓	✓					✓		✓
11	Himachal Pradesh	✓						✓		
12	Jammu and Kashmir							✓		
13	Jharkhand									
14	Karnataka	✓	✓					✓	✓	✓
15	Kerala		✓					✓	✓	*
16	Madhya Pradesh	✓						EU		*
17	Maharashtra	✓						EU	✓	*

S.no	State/UT	ECBC Amendm ent	ECBC Notificatio n	Notification in bye-laws	Notificatio n at Municipalities	Enforc ement	Schedul e or Rates-PWD	ECBC Cell	Training & Capacity Development	Energy Simulation Software
18	Manipur							✓		
19	Meghalaya							✓		
20	Mizoram							✓		
21	Nagaland							✓		
22	Odisha	✓	✓					EU		*
23	Puducherry UT	✓	✓					✓		
24	Punjab	✓	✓					✓	✓	✓
25	Rajasthan	✓	✓					✓		
26	Sikkim							✓		
27	Tamil Nadu	✓						✓		
28	Telangana	✓	✓					✓	✓	*
29	Tripura							✓		
30	Uttar Pradesh	✓						✓		✓
31	Uttarakhand	✓	✓					✓		
32	West Bengal	✓	✓					✓		

# Highlights of ECBC 2017



Integration of current provisions and relevant standards

## New sections in ECBC 2017-

ECBC 2017 to have an International benchmark Code specific to Indian conditions – Climatic and Construction  
Pave the way for future net zero energy buildings

3 different sets of requirement – ECBC 2017, ECBC+ buildings, SuperECBC buildings

Wider scope in Comfort systems and controls, Integration of low energy comfort systems, natural ventilation, set points, Controls

Daylighting, Shading requirement with relaxed U value

Revised document structure for ease of use

Provision for inclusion of Renewable Energy

Stringent Lighting Requirements with focus on better controls

Stringent requirements for air conditioning systems and controls

Compliance for New Construction, Core & Shell, Tenant lease type etc

# Features of ECBC



- ◆ Vision of **Near Zero Energy Buildings** for India
- ◆ Respond to the Changes in **Building Technologies**
- ◆ **Energy Savings & Comfort** for Occupants
- ◆ Expanded Coverage for **More Building Types**
- ◆ **Mandatory Implementation** and Enforcement

# ECBC 2017 – A Unique Tiered Structure

## Toward Near Zero Energy Buildings

ECBC+

35%

SuperECBC

50%

ECBC

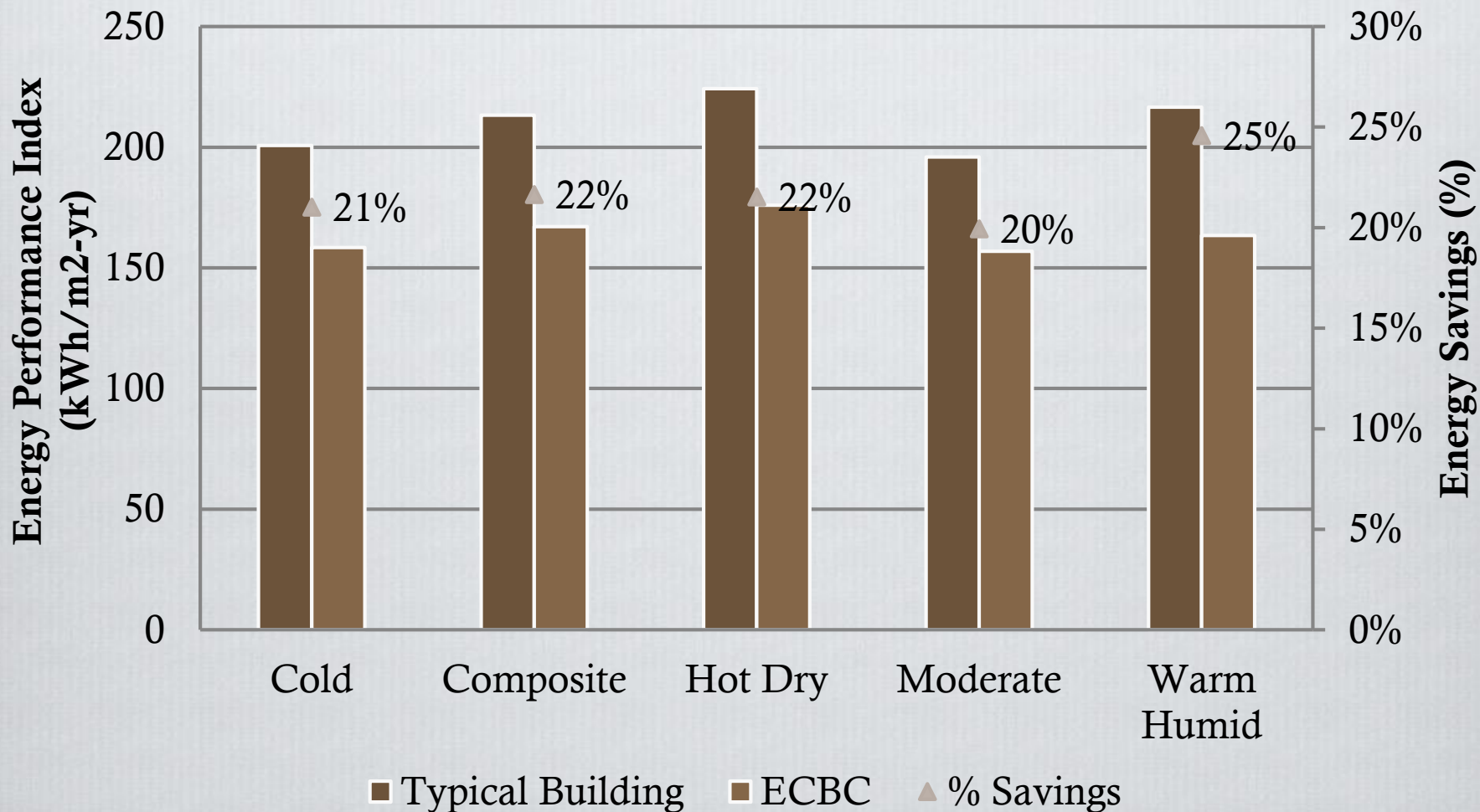
Mandatory Minimum standards for Commercial Buildings

25%

Ministry of Power, India  
better than typical



# ECBC Impact





# Potential Impact

- ◆ 50% Energy Savings
- ◆ **300 BU** Energy Savings
- ◆ **15 GW** Peak Demand Reduction
- ◆ **250 mtCO<sub>2</sub>e** GHG Abatement
- ◆ **35,000 Crore Rupees Savings**

# Way Forward



## Commercial Buildings

- ◆ Enforcement through Energy Management Information System
- ◆ Benchmarking of Existing Buildings
  - ◆ Dashboard for Buildings
  - ◆ Labeling of Buildings
- ◆ Integration of ECBC in municipal bye-laws
- ◆ SuperECBC buildings in 5 states
- ◆ Reduction in Energy Performance Index (EPI) of existing buildings through deep retrofits
- ◆ Inclusion of remaining other categories of Commercial Buildings under the PAT Scheme.
- ◆ Energy Efficient Components (Appliances & Material)
- ◆ Building Passport (New Scheme)

## Residential Buildings

- ◆ Development of Energy Conservation Building Codes for Residential Buildings

# Thank you

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