India’s Building Efficiency Programme: 
Achievement & Challenges

Conserving Now, Preserving Future
Contents

• India’s Electricity Scenario
• Commercial Buildings Profile
• Residential Building Profile
• Government of India Initiatives
• Challenges
• Energy Conservation Building Codes
• Energy Management Information System
• Residential Building Codes
India’s Electricity Scenario

Conserving Now, Preserving Future

Industries; 44.0%
Transport; 1.6%
Residential; 24.1%
Commercial; 9.1%
Agriculture; 18.3%
Others; 3.0%

Electricity Consumption Pattern

Electricity Generation

Electricity Consumption

33.2% Residential & Commercial Buildings

Electricity Consumption Pattern

Ministry of Environment, Forest and Climate Change
Government of India
Over 2000 New Growth Centers by 2050 From ~400 Towns and Cities in 2015
India will add 1 Billion m² of New Commercial Buildings by 2030
Commercial Building Stock (Year 2030)

- **Hospital**: 106 million s.q.m.
- **Hotels**: 107 million s.q.m.
- **Retail**: 201 million s.q.m.
- **Education**: 210 million s.q.m.
- **Office**: 291 million s.q.m.
1. In 2015, the **rate of urbanization** was 31%. Niti Ayog estimated that the same would increase to 51% by 2047.

2. **Per capita residential floor space** to rise 35 sqm by 2050 from the 10.8 sqm in 2012.

3. **Housing for all by 2022**

4. **100 smart cities to be developed in India**

In 2011, 53 Indian cities had a population more than 1 million. That would rise to around 77 cities by 2030 itself.

Source: Niti Ayog, UN Report, KPMG and GBPN.
**Residential Energy Projections**

Conserving Now, Preserving Future

- **1.** Compared to 2015, India’s space cooling demand will rise by 8 times by 2050.
- **2.** 24X7 electricity for all by 2018. This will ensure greater availability of electricity for residents.
- **3.** Demand push – Housing for all by 2022 and 100 smart cities.
- **4.** Exponential increase in population

Primarily because of three factors –
- 1) Market-driven strategies like voluntary use of star labeled product
- 2) ECBC-R 2019 – Minimum efficiency requirement. The scenario assumes a 5% use of ECBC envelopes in new buildings
- 3) Around 50% compliance of ECBC and 10% compliance to advance EE codes.

- **CAGR** –
  - 6X: 5.4%
  - 4.5X: 4.5%
  - 3.5X: 3.7%
  - 3.5X: 2.8%

Possible reduction of **58%** from the BAU by 2050, if we adopt the very aggressive scenario.

---

**Government of India**

Ministry of Environment, Forest and Climate Change
Government of India Initiatives

Conserving Now, Preserving Future

Energy Conservation
Building Codes
Deep Retrofits
PAT Targets
Energy Efficient Materials
Energy Management
Information System
Building Passport
Commercial Buildings
Residential Buildings
Residential Building Codes
Low Cost Finance
Building Passport
Energy Management Information System

Ministry of Environment, Forest and Climate Change
Government of India
Challenges

Conserving Now, Preserving Future

1. Ratcheting of Standards
2. Benchmarking
3. Data Standards

1. Customization
2. Role of State Government
3. Third Party Assessment
4. Assessment tools

1. Role of State Government
2. Penalty mechanism
3. Checking protocols

1. Split Incentives
2. Availability of technical knowledge
3. Ease in compliance
Energy Conservation Building Code (Commercial)

Toward Near Zero Energy Buildings

<table>
<thead>
<tr>
<th>ECBC+</th>
<th>SuperECBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>35%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**ECBC**
Mandatory Minimum standards for Commercial Buildings
- 25% better than Typical

Conserving Now, Preserving Future
Highlights of ECBC 2017

Integration of current provisions and relevant standards

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

Revised document structure for ease of use

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

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

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
Residential Building Codes

• The initial focus in on “building envelope” in residential building
  – Life duration of the buildings
  – Difficult to modify it substantially during the life
  – What is saved by building initial envelope design is for the entire building life

• For residential buildings, started with prescriptive/ deemed to satisfy compliance route
Thank You

Saurabh Diddi
Director
Bureau of Energy Efficiency

sdiddi@beenet.in