Implementing ECBC in Andhra Pradesh and Impacts on Real Estate Development

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Presentation Overview

- Introduction
- ECBC in Andhra Pradesh
- Learning from Code Implementation
- Energy Efficiency and Real Estate Development
Introduction to ASCI and NRDC

Administrative Staff College of India (ASCI) is a pioneer management and research organization established in Hyderabad in 1956 and works with the public and private sector.

The Natural Resources Defense Council (NRDC) is an international nonprofit environmental organization established in 1970, working on advancing energy efficiency with business and government leaders in the US, China and elsewhere.

- ASCI-NRDC work in partnership with the private and public sectors in India to promote energy efficiency in buildings and appliances since 2009.
- We partner with real estate developers, financial institutions, and national and local government to promote building efficiency throughout India.
The Energy Efficiency Opportunity

• Rapid growth of India’s real estate sector
  – 2/3 of commercial buildings that will exist in 2030 have yet to be built
  – Large-scale urbanization, increasing income

• Trends in Indian real estate
  – Popularity of Green buildings (LEED, GRIHA, ECBC)
  – Increasing energy intensity of buildings
  – Growing demand for energy-saving buildings

• Cost savings and increased market share

ECBC in Andhra Pradesh and Telangana State: Work that went into the code, and next steps


- Extensive stakeholder consultations and awareness building about ECBC
- Formation of a steering committee and a technical committee to inform process and adapt ECBC to local bylaws
- State bifurcation into Andhra Pradesh (AP) and Telangana State (TS) announced in Feb ’14 – both states inherit the same code

- Empanelment of architects underway
- Training ongoing – target reaching 400 district officials, real estate developers and architects
- Aug ‘14 onwards in TS
- Feb ’15 onwards in AP
ECBC Adoption: Roles of Key Agencies

- **National Level**
  - Ministry of Urban Development
    - Issues directives to states for ECBC implementation

- **State Level**
  - State Ministry of Urban Development
    - Issues a directive to state and local level bodies to start implementing ECBC

- **Local Level**
  - Urban Development Departments (UDDs)
    - Develop General Development Control Regulations
  - Urban Local Bodies (ULBs)
    - Write ECBC compliant building codes and ensure compliance at the municipal level
  - Town Development Offices (TDOs) and Town Planning Offices (TPOs)
    - Include provisions into local building code (need to be approved by BEE)

- **Office of Chief Secretary**
  - Guide Decision

- **Department of Energy**
  - Prepares building standards
  - Guide Decision

- **State Designated Nodal Agency**
  - Administers the ECBC

**Guide**
- Decision

**ECBC adapted by State**

**Ministry of Power - Bureau of Energy Efficiency**
- Develops Energy Conservation Building Code (ECBC) 2009

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AP ECBC: Key differences from ECBC

• Applicable to commercial buildings, offices, hospitals, IT parks
• Applicable to new commercial and public buildings with plot area of 1,000 m² or built up area of 2,000 m²
• Irrespective of plot and built-up area, all multiplexes, hospitals and hotels need to comply with ECBC
• Independent certification and validation through third party assessors at two stages
• Star rated based on level of energy savings
• Fast track approvals for buildings rated ECBC two-star and above
Building Approval Process

Design Phase

Owner / Builder Submits Building Designs

Third Party Assessor

Urban Local Body issues construction approval

Construction Phase

Owner / Builder Constructs Building

Third Party Assessor

Urban Local Body issues occupancy certificate

Occupancy Phase

Owner / Builder Sells, Rents or Occupies Building

Overall Monitoring by State Designated Agency and Municipal Administration Department
# Capacity Building Activities

<table>
<thead>
<tr>
<th>Activities</th>
<th>Description</th>
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</table>
| Capacity Building for Town Planning Officials and Elected Representatives | • Training program for city town planners, engineers and officials at urban local bodies (ULBs)  
• Develop compliance materials                                                                 |
| Empanelment of consultants                     | • Selection of empaneled consultants  
• Workshops focused on AP ECBC, GO-168, Role of Consultants, etc.  
• Workshops across major cities of AP and TS, e.g. Vizag, Vijaywada, Hyderabad, Warangal etc. |
| Train the trainer activity                      | • Tests conducted in major cities using based on ECONirman Examination                                                                 |
| Awareness building with elected representatives and others | • Regional workshops  
• Training and certification of independent verifiers                                                                                     |
| Pilot project to extend support to GHMC         | • Support to municipal corporation for effective implementation of ECBC                                                                       |
| BEE Demonstration Project                      | • BEE has extended technical guidance for ECBC compliant design for government buildings                                               |
States Leading in Advancing Energy Efficiency in Buildings

- Haryana
- Rajasthan
- Gujarat
- Maharashtra
- Karnataka
- Tamil Nadu
- Uttar Pradesh
- West Bengal
- Orissa
- Telengana
- Andhra Pradesh

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Lessons from Andhra Pradesh

• *Senior government buy-in is* critical for code implementation

• *Power shortage situation* helped create political will to act on efficiency

• *Steering committee with multiple stakeholders* – real estate developers, government officials, architects, helped address issues early on, keeping stakeholders onboard

• *Taking into account local body functioning* – more comfortable with area based thresholds

• *Importance of flexibility* – expedited clearance for ECBC compliant projects rated two-star and above
The Business Case for Energy Efficiency

• ASCI-NRDC are developing materials and case studies to showcase energy efficiency in leading buildings, including
  ✓ Detailed payback periods
  ✓ Returns on key measures

• Report: *Constructing Change*, examines initial action steps for real estate developers, local governments, and financial institutions

• Report: *Taking Energy Efficiency to New Heights*, maps stakeholder opportunities for the real estate sector using Hyderabad as a case study

• Factsheets and resources for saving money for building owners, managers and tenants
# Buildings Already Achieving Cost Savings from Energy Efficiency

<table>
<thead>
<tr>
<th>Building</th>
<th>Location</th>
<th>Type</th>
<th>Key Efficiency Measures</th>
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<tbody>
<tr>
<td>Corporate Office</td>
<td>Noida</td>
<td>New Build</td>
<td>• Design features, HVAC, lighting&lt;br&gt;• Payback period of 3.3 years</td>
</tr>
<tr>
<td>Spectral/AECOM</td>
<td></td>
<td></td>
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<tr>
<td>Amara Raja Building</td>
<td>Hyderabad</td>
<td>New Build</td>
<td>• Design features&lt;br&gt;• Extensive monitoring and verification (M&amp;V)</td>
</tr>
<tr>
<td>Infosys SDB-1</td>
<td>Hyderabad</td>
<td>New Build</td>
<td>• Radiant cooling, design, lighting, M&amp;V&lt;br&gt;• 33% annual savings from radiant cooling</td>
</tr>
<tr>
<td>Infosys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Godrej Bhawan, Godrej and Boyce</td>
<td>Mumbai</td>
<td>Retrofit</td>
<td>• HVAC, lighting, M&amp;V; 12% annual savings&lt;br&gt;• Payback period of 4.7 years</td>
</tr>
<tr>
<td>Millennia Park</td>
<td>Chennai</td>
<td>Retrofit</td>
<td>• HVAC, building automation system</td>
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<td>RMZ Corporation</td>
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<tr>
<td>Mahindra Towers</td>
<td>Mumbai</td>
<td>ESCO</td>
<td>• ESCO financed light retrofit; 14% savings&lt;br&gt;• Payback period of 6 months</td>
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<tr>
<td>Mahindra &amp; Mahindra</td>
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Links to NRDC Publications

Issue Briefs
Strengthening the Real Estate Market Through Codes
http://www.nrdc.org/international/india/files/real-estate-efficiency-codes-IB.pdf
Incentives for Energy Efficient Buildings
http://www.nrdc.org/international/india/files/energy-efficient-construction-incentives-IB.pdf

Case Studies
Mahindra Towers (ESCO)
Godrej Bhavan (Retrofit)
AECOM (Formerly Spectral Building, New Construction)
Thank you!

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Natural Resources Defense Council
www.nrdc.org/international/india

Administrative Staff College of India
www.asci.org.in
Additional Slides
Efficient Building: Godrej Bhawan, Mumbai

- Retrofit of building constructed in 1970
- Key measures
  - Replacement of old HVAC system
  - Efficient lighting measures
  - Building management system for monitoring and verification
- Overall 12% reduction in energy use
- ASCI-NRDC case study
Proposed Implementation of ECBC in Andhra Pradesh

• 1 day Orientation
  – Lead by government with support from NRDC and ASCI
  – Attended Town and Planning Departments

• 3 day Training Sessions
  – Groups of about 20 people, 8-10 occurrences
  – Trainings for:
    • Municipal Officials/Engineers
    • Architects/Engineers
BEE Training Resources

• Training of Master Trainers
  – Master Trainers train other stakeholders (architects/engineers, state officials, etc.)
• Lists of ESCOs and empanelled architects
• Conformance Check Tools
• Energy Management Tools
• Online Guides
• Examples

India ECO-III Training Resources

- Interactive Q&A sessions
- Technical Guidance
- Examples/Case Studies
- Resources and Reference Material
- Building energy simulation effort
- ECBC in Architecture Curriculum
- ECBC Training and Awareness workshops
- Guides
- ECBC User’s Guide

What Developers Are Saying about ECBC Implementation Barriers

- Strong first cost bias
- Availability of efficient products
- Equipment testing & certification
- Energy expertise
- Awareness, information and tools
- Electricity rate structures / rural subsidies
- Territoriality by agencies
- Potential code official abuses
- Lack of government & utility “Champions”

Key Barriers Identified at ECBC Impact Assessment

• Need more technical expertise and training
• Technical skills in ULB
• Scattered information
• Weak information flow
• Voluntary nature weakens market trends
• Need plan for mandatory implementation
• Need demonstrations
• Limited certified materials → reduces confidence in savings
• Split incentive
• Multiple agencies