Launch of
ECBC Conformance Check Tool – ECOnirman and
ECBC Professional Training Modules

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International Resources Group

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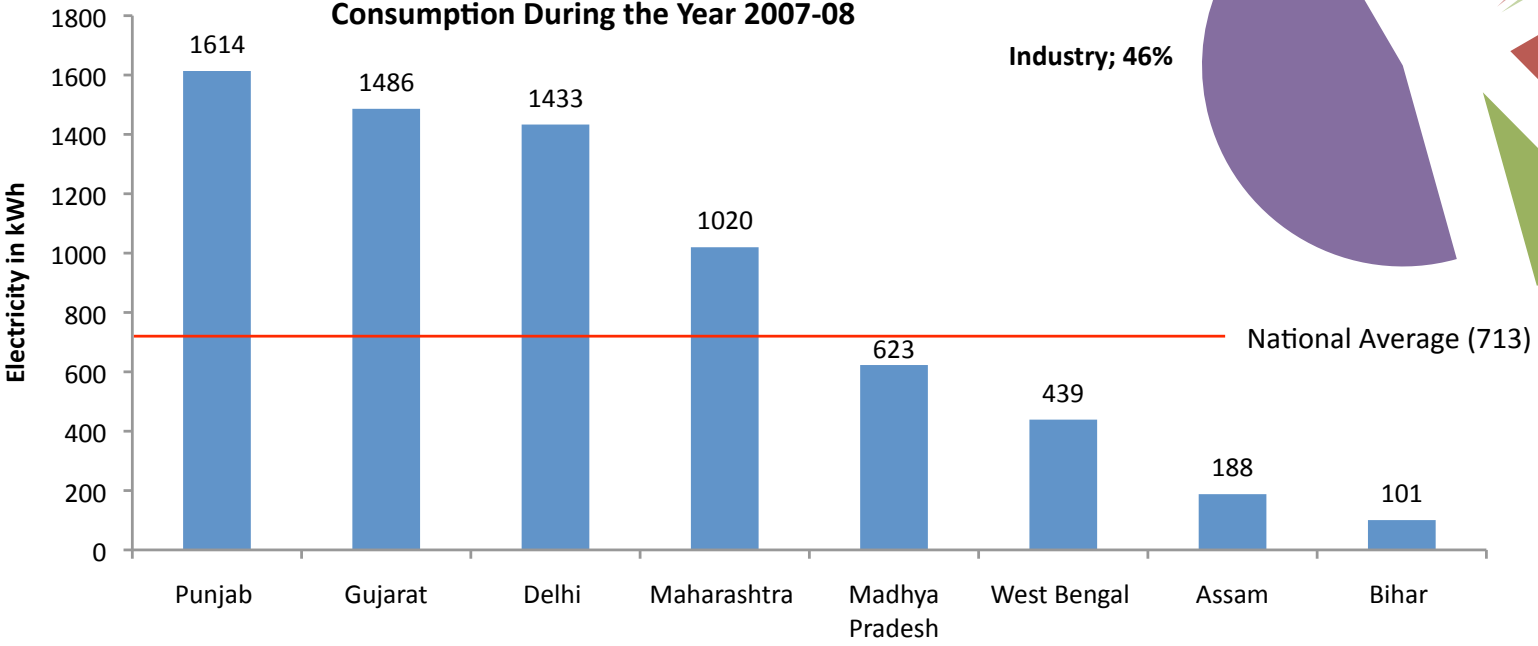
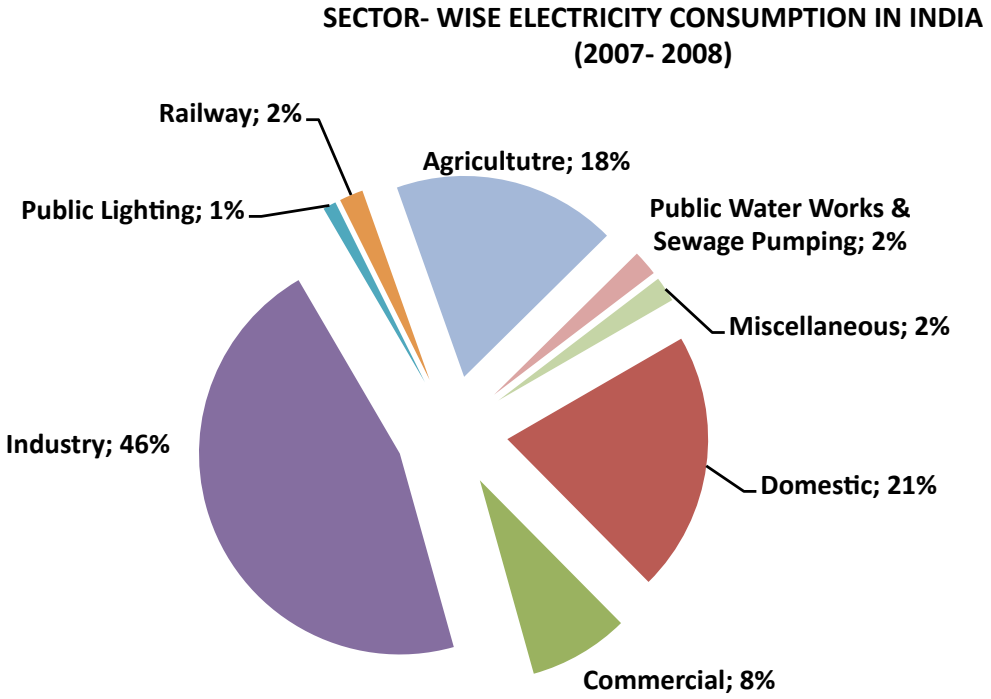
Electricity Scenario in India





Source: Central Electricity Authority's 'Year End Review 2007-08'

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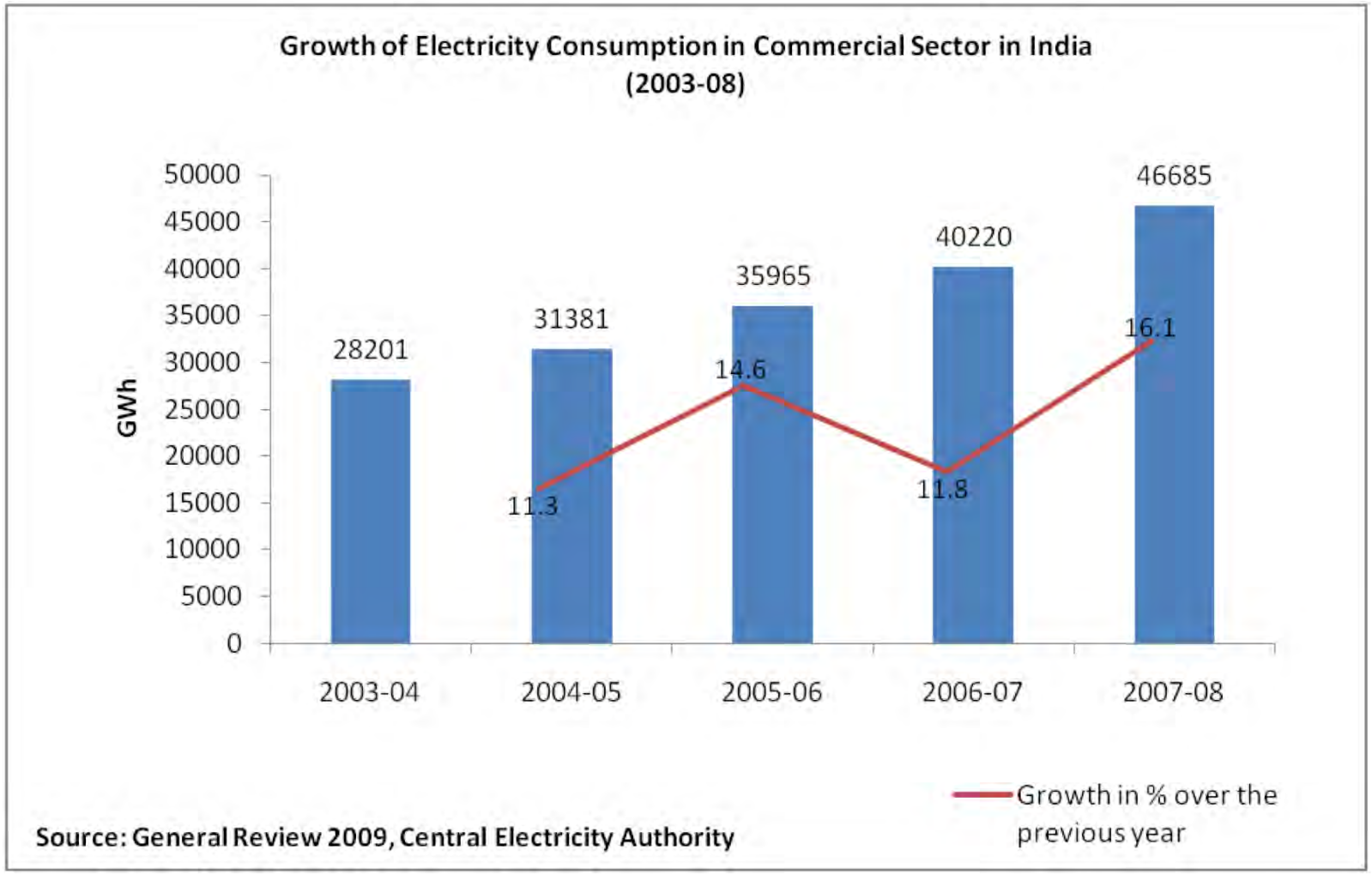
Electricity Growth in Commercial Sector



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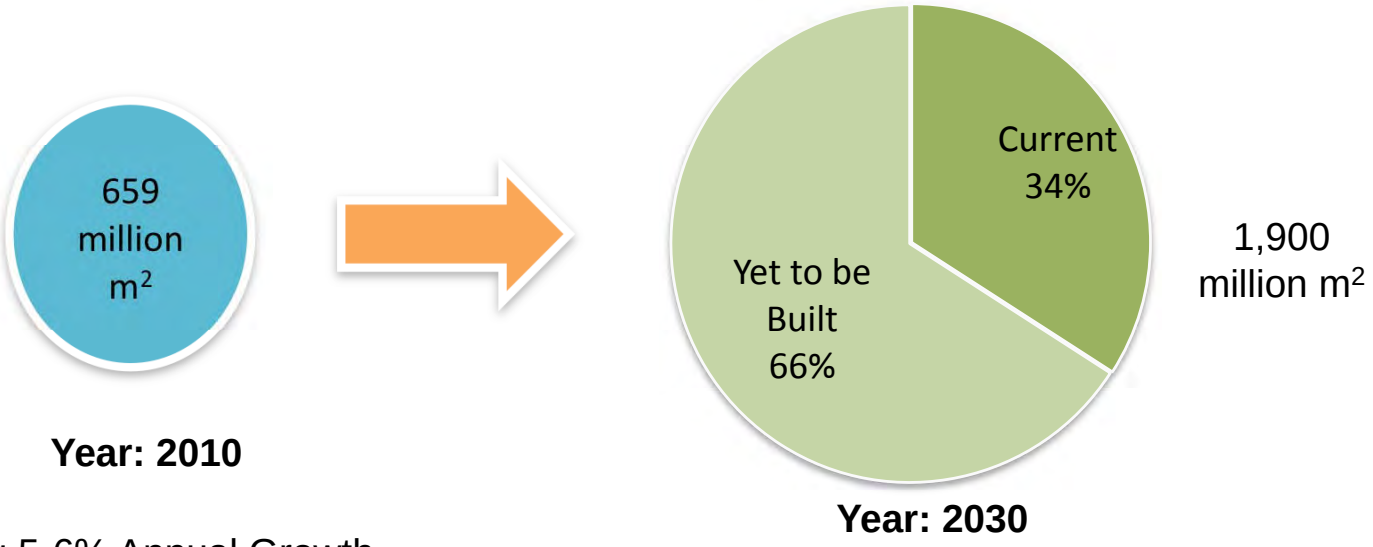
Growth in the Indian Building Sector

Commercial Buildings Floor Area - Growth Forecast

- Currently, ~ 659 million m^2 (USAID ECO-III Internal Estimate Using MOSPI, CEA and Benchmarked Energy Use data)
- In 2030,~ 1,900 million m^2 (estimated)*
  - 66% building stock is yet to be constructed



* Assuming 5-6% Annual Growth

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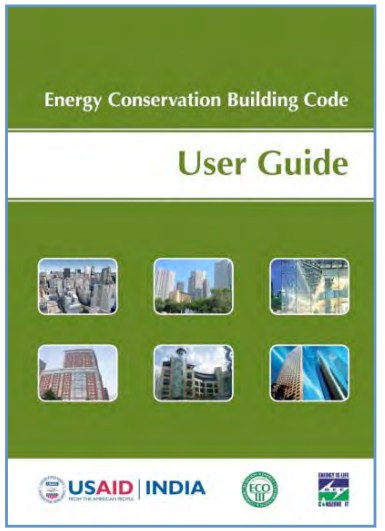
ECBC Implementation

- Technical Resources Development and Capacity Building
  - **ECBC User Guide**
    - Easy-to-understand, referred ASHRAE 90.1 User Manual
    - Aims to drive widespread understanding & implementation of ECBC
  - **ECBC Tip Sheets**
    - Tip Sheets on Envelope, HVAC, Lighting, Energy Simulation (ASE)
    - E-Source Technology Atlas Series used as resources
    - Help drive enhanced understanding on ECBC Concepts to Applications
  - **Awareness Workshops and Seminars**
    - National level dissemination on ECBC
    - Key Partners: BEE, State Designated Agencies (GEDA, PEDA, MEDA)
    - Over 2,600 people have attended our training & awareness workshops



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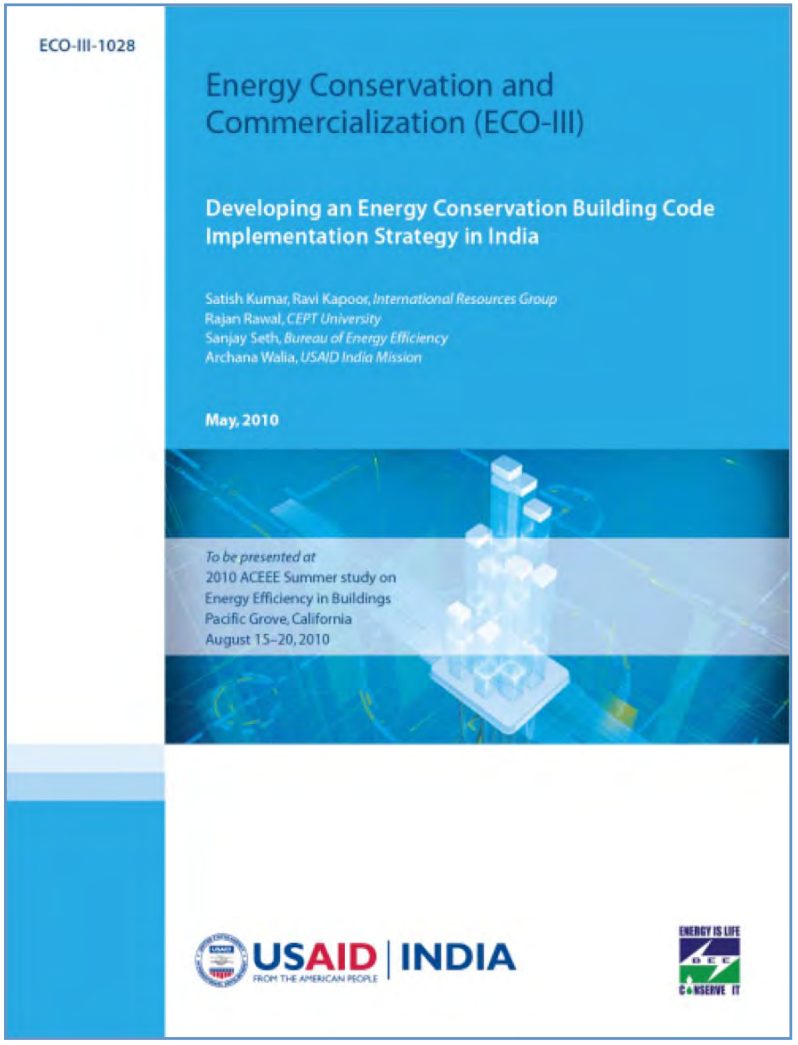
ECBC Implementation - New Initiatives

Moving From Technical Resources Development and Capacity Building to Implementation

ECBC Implementation Roadmap

- Report – ECBC Implementation Strategy in India
- Creation of framework to test ECBC implementation in one state – Rajasthan
- Creation of a replicable model for use across the country



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New Initiative - ECBC Conformance Check Tool

- Developed by USAID ECO-III & BEE

Why this Tool

- Need for assistance at design stage & facilitate design improvements

Partners

- Knowledge Partner – Pacific Northwest National Laboratory (US Department of Energy Laboratory)
- Software Partner – GreenTree Building Energy Pvt. Ltd.

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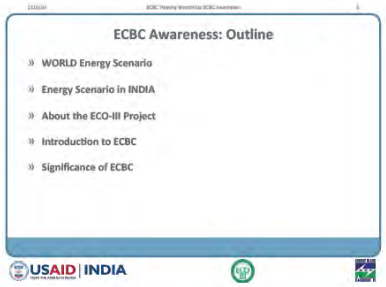
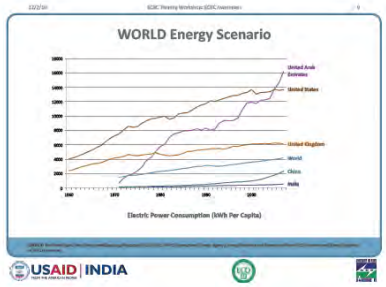
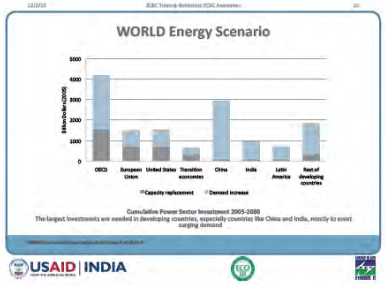
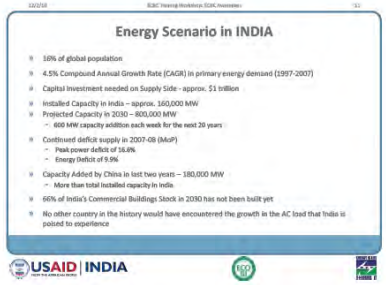
New Initiative - ECBC Professional Training Modules

- Developed by USAID ECO-III in partnership with BEE
- Need for a BEE-Certification program for Architects, Energy Professionals and Code Compliance officials









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ECOnirman - Online ECBC Conformance Check Tool

- Planned Design Objectives
  - Design for conditions prevalent in the Indian sub-continent
  - Include parameters: Site location, building data, building materials and system data
  - Store information in a database for future access and maintenance
  - Include provision for transferring data for country wide survey and analysis
  - Checks and reports ECBC Conformance of Building and its Systems

ECOnirman

- Development Process
  - Organized a Stakeholder workshop at BEE in March 10
    - In partnership with DOE's Pacific Northwest National Laboratory
  - Concluded algorithm implementation based on Workshop feedback
  - Preliminary Demonstration to BEE Team
  - Limited deployment of ECOnirman – April 10 onwards
    - "Use Case" tests to gather feedback
  - Refinement and Full deployment by November 10

ECOnirman - Online ECBC Conformance Check Tool

- Designed for assessing ECBC conformance of commercial buildings (five climatic zones)
- Assesses the overall conformance of
  - Entire Building
  - Building systems : Envelope, HVAC, Lighting, Service Hot Water & Pumping and Electrical Power Systems

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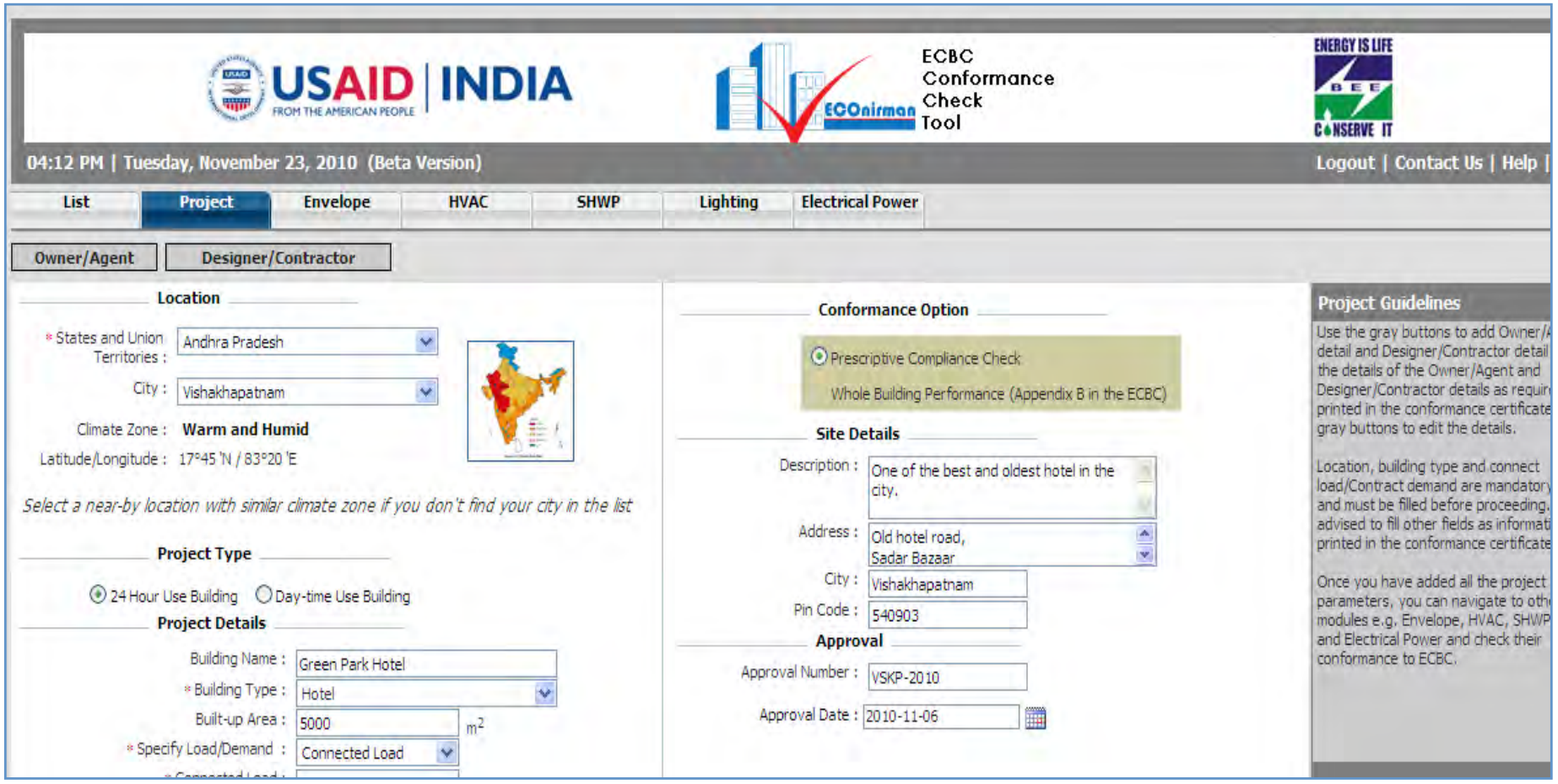
ECBC Conformance Check Tool: ECOnirman

http://www.buildingenergytools.in/econirman



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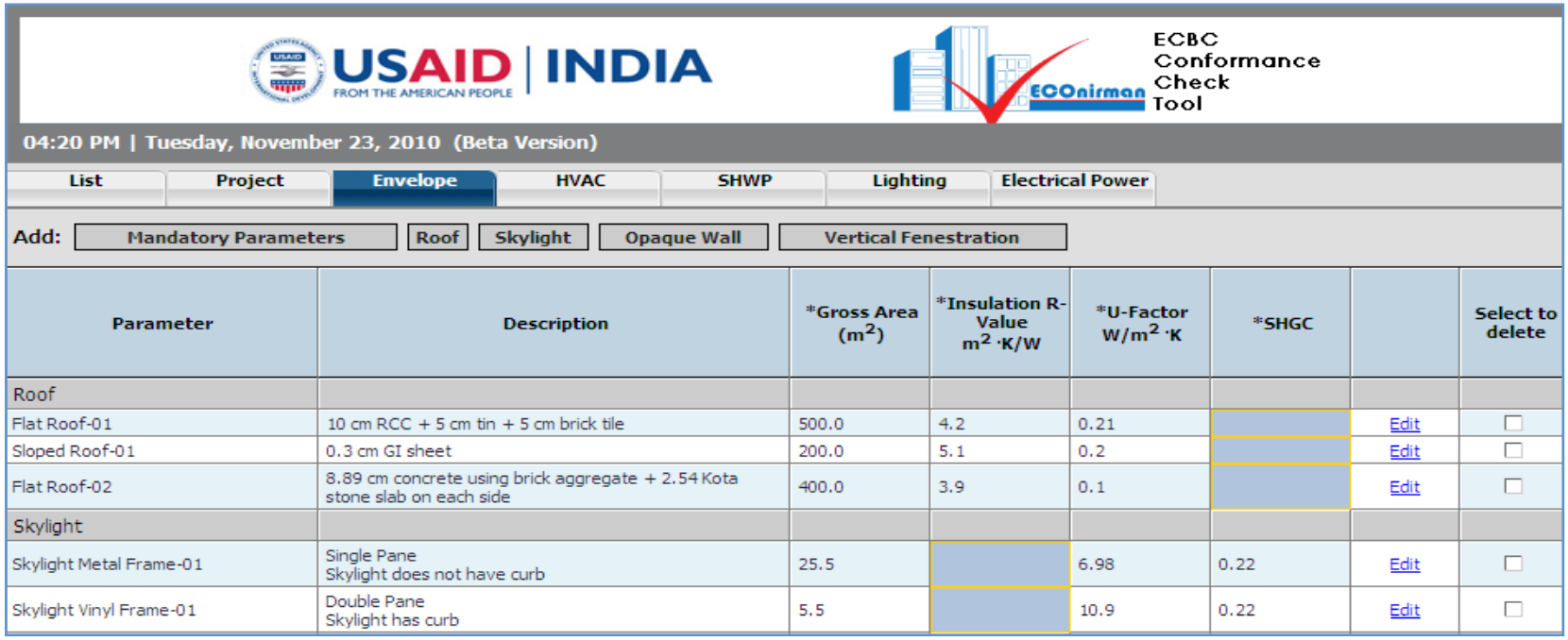
ECOnirman Features

- Takes into account both mandatory and prescriptive requirements of ECBC
- Seeks building's information such as site location, type of building, and other technical details of the building systems



Parameter	Description	*Gross Area (m^2)	*Insulation R-Value $m^2 \cdot K/W$	*U-Factor $W/m^2 \cdot K$	*SHGC		Select to delete
Roof							
Flat Roof-01	10 cm RCC + 5 cm tin + 5 cm brick tile	500.0	4.2	0.21		Edit	☐
Sloped Roof-01	0.3 cm GI sheet	200.0	5.1	0.2		Edit	☐
Flat Roof-02	8.89 cm concrete using brick aggregate + 2.54 Kota stone slab on each side	400.0	3.9	0.1		Edit	☐
Skylight							
Skylight Metal Frame-01	Single Pane Skylight does not have curb	25.5		6.98	0.22	Edit	☐
Skylight Vinyl Frame-01	Double Pane Skylight has curb	5.5		10.9	0.22	Edit	☐

ECOnirman Features

- Assesses the conformance of the building and its systems
- Option of checking envelope conformance by “Trade-off Method”
- Generates ECBC Conformance Report indicating which building systems are ‘conforming’ or ‘not conforming’ to ECBC

Envelope Conformance Summary

Envelope Component	Conformant	Non-Conformant	Conformance Status
Walls	4	0	Yes
Roofs	3	0	Yes
Vertical Fenestration	2	0	Yes
Skylights	2	0	Yes

LIGHTING Conformance Summary

Lighting Component-Mandatory	Conformance Status
Lighting Control	Yes
Exit Signs	Yes
Exterior Building Grounds Lighting	Yes
Lighting Component-Prescriptive	
Interior Lighting Power	
Installed Interior Lighting Power	No
Exterior Lighting Power	No

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ECBC Conformance Report

Building Information

Building ID(generated by tool)	000002	Date	12/09/2010
Building Name	Green Park Hotel		
Hours of Use	◉ **24 hour Use(Hospital,Hotel, Call center)**	○ Day-time Use (Other Building type)	
Building Function	Hotel One of the best and oldest hotel in the city.		
Building Description	☑ **New Building**	☐ Addition	☐ Alteration ☐ Change of Use
Connected Load / Contract Demand	200 kW/ 0 kVA		
Gross Built-up Area	5000 Square Meters		
Conformance Option	**Prescriptive**		
Site Address	Green Park Hotel, Old hotel road, Sadar Bazaar , Vishakhapatnam		
City	Vishakhapatnam		
State	Andhra Pradesh		
Pin Code	540903		
Climatic Zone	Warm and Humid		
Permit Number	VSKP-2010		
Permit Date	2010-11-06		

Contact Details

Owner/Agent		**Designer**	
Name	Ajeet, Gupta	**Name**	Ajay, Verma
Company	Green Park	**Company**	Wizlemon Architects
Address	Old Palace Road Dihwa, Sultapur	**Address**	Golf Course Road, Near TAJ palace, Bangalore
City	Sultanpur	**City**	Bangalore
State	UP	**State**	KA
Pincode	228001	**Pincode**	670032
Phone	9043996759	**Phone**	91894526590
Email	ajeet@greentree-india.com	**Email**	ajay@wizlemon.com

Building Conformance Summary

System	Conformance Status
Envelope	Yes
HVAC	Yes
SHWP	Yes
Lighting	Yes
Electrical Power	Yes

ECOnirman Features

- Can save data of a number of building projects under a single user profile
- Stores information in a database for future review, editing and analysis by the user
- Can facilitate the user in retrieving the lost data

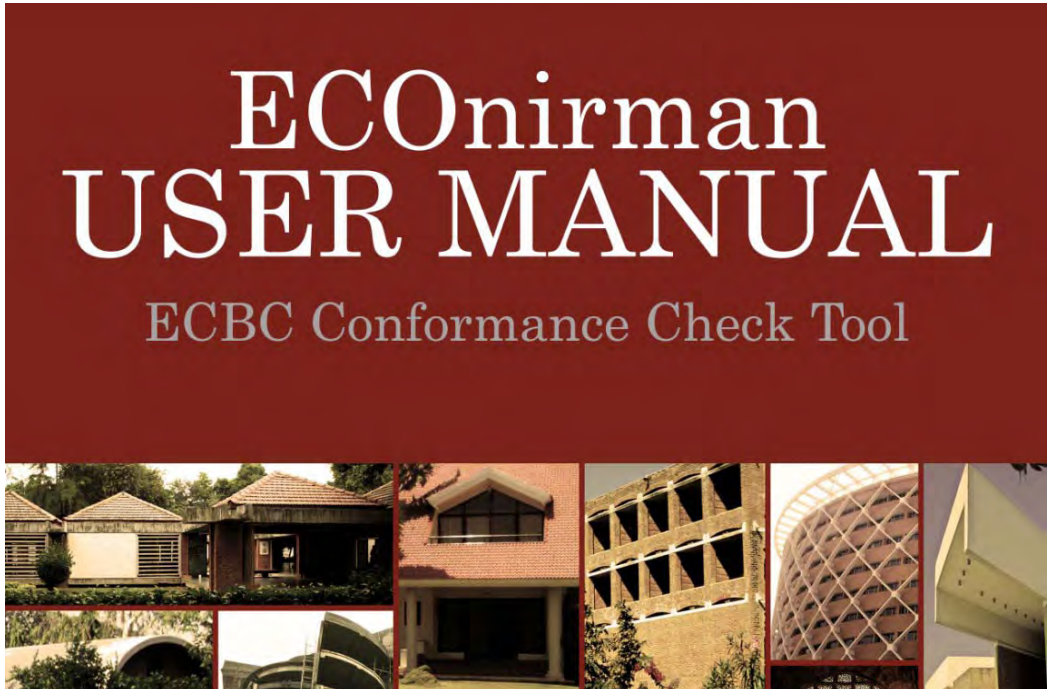
ECOnirman Review by Stakeholders

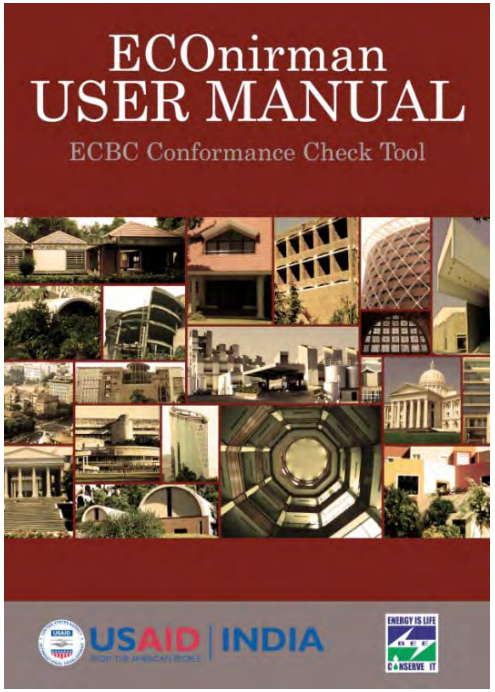
- Review of Beta version
  - Environmental Design Solutions
  - International Institute of Information Technology
  - Kalpakrit Sustainable Environments Pvt. Ltd.
  - Sanjay Prakash & Associates
  - Spectral Services Consultants Pvt. Ltd.
  - The Energy and Resources Institute
  - The Weidt Group
- Helped in several refinements in the Tool
- Uploaded in public domain. (www.buildingenergytools.in/econirman)

ECOnirman User Manual

Guide the User

- On-line submission of Building data
- Generation of building ECBC Conformance Report





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Sample Pages – User Manual

A	Click **About ECOnirman** to view a brief introduction to ECOnirman; click **Contact Us** to write to the ECOnirman team; click **Help** to view this user manual online; click **Close** to close the web browser window
B	Log in to assess if a building and its components conform to ECBC (refer to § 4.2.1)
C	Click **Guest User** to log in as a guest user (without a user name and a password)
D	Click **Forgot Password** to retrieve a forgotten password (refer to § 4.2.3) Click **Sign Up** to register as a new user (refer to § 4.2.2)
E	Announcements related to ECOnirman
F	Click on the thumbnails to open the **ECBC Tip Sheets** related to the different building components (refer to § 4.2.4)
G	Click on the thumbnails to open this **ECOnirman User Manual** and the **ECBC User Guide**

It is imperative to save the details before navigating to another tab/sub-tab within the tool. A prompt appears within the tool to remind this.

Click **OK** to save the details entered on each tab/sub-tab.

4.2.1. Log In

Enter the **User ID** and **Password** on the home page.

The password is case sensitive.

Click **Log In** to log into ECOnirman.

4.2.2. New User

If you do not have a User ID and are new to ECOnirman, click **Sign Up** from the home page to register as a new user. The **User Sign Up** page opens.

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ECBC Professional Training Modules

- **Target** : Architects, Energy Professionals, Compliance Officials

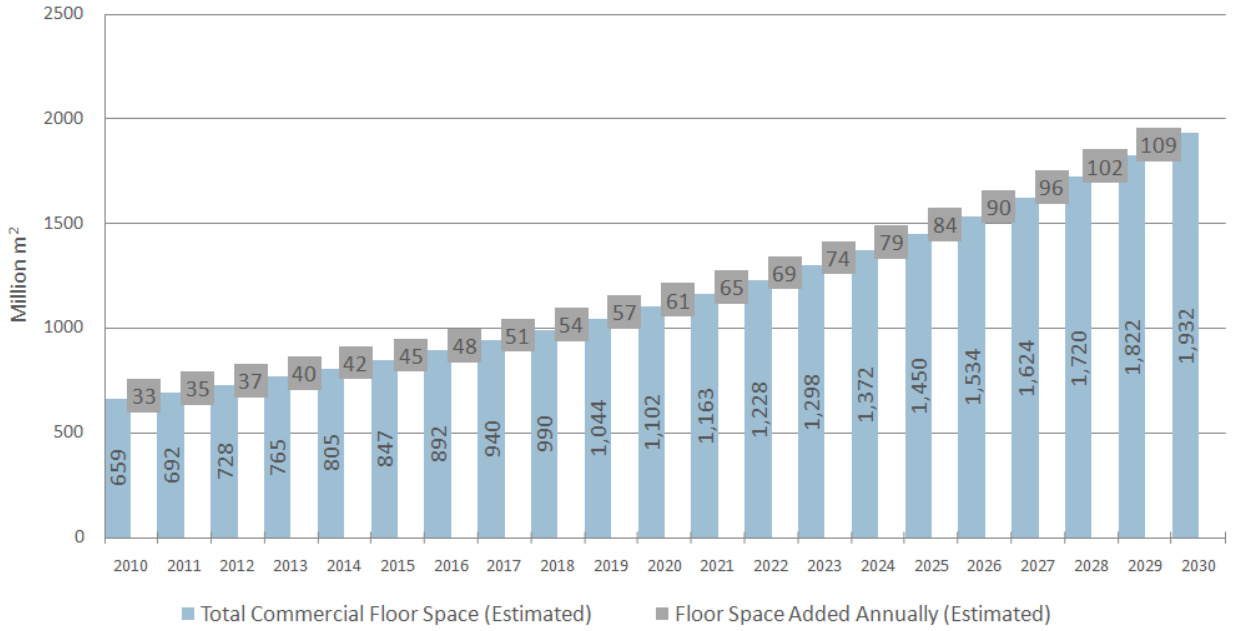
- **Objectives**
  - Enhance awareness on ECBC
  - Provide technical guidance
  - Provide administrative guidance
  - Provide guidance for demonstrating ECBC compliance
  - Provide reference list and other resource material
  - Develop ECBC Proficiency Test

Training Modules

- ECBC Awareness
- ECBC Scope and Administration
- Building Envelope
- Heating, Ventilation & Air Conditioning (HVAC)
- Service Hot Water & Pumping
- Lighting
- Electric Power
- Demonstrating Compliance
- Building Physics Primer
  - Concepts and First Principles – Basis of ECBC Specifications

Typical Slide - ECBC Training Module

Commercial Buildings Growth Forecast



Commercial Floor Space Projection for India *(Assuming 5-6% Annual growth)*

SOURCE: USAID ECO-III Project, New Delhi

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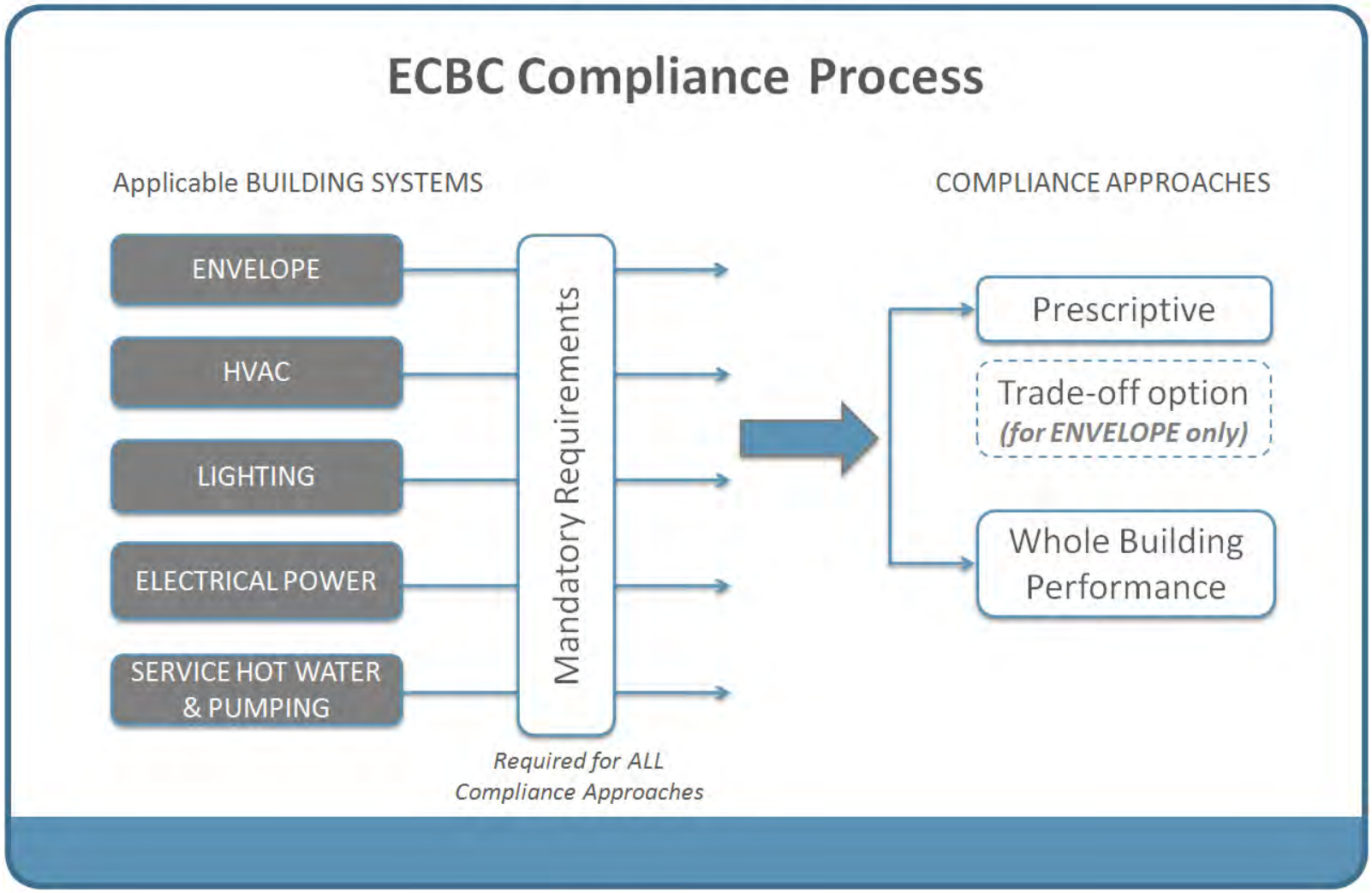
Typical Slide - ECBC Training Module



Typical Slide - ECBC Training Module

ECBC Requirements: Mandatory

» U-factors shall be determined from the default tables in Appendix C §11 or determined from data or procedures contained in the ASHRAE Fundamentals, 2005.

Description	Density kg/m³	Conductivity[b] (K), W/(m·K)	Conductance (C), W/(m²·K)	Resistance[c] (R) 1/k, K·m²/W	Resistance[c] (R) For Thickness Listed (1/C), K·m²/W	Specific Heat kJ/(kg·K)
BUILDING BOARD						
Asbestos cement board.....	1900	0.58	—	1.73	—	1.00
Asbestos-cement board....3.2 mm	1900	—	187.4	—	0.05	—
Asbestos-cement board....6.4 mm	1900	—	93.7	—	0.011	—
Gypsum or plaster board. 9.5 mm	800	—	17.6	—	0.056	1.09

Typical Slide - ECBC Training Module

Optimizing energy use for thermal comfort

External Factors (Climate)

Temperature
Relative humidity
Solar Radiation
Wind Speed and Direction
Miscellaneous factors

Passive Strategies

- Appropriate orientation
- Shading devices
- Daylight design
- Thermal mass (time lag)

Active Strategies

- Fans
- Evaporative Coolers
- Air-Conditioners

Internal Factors (Loads)

People
Equipments
Lights

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ECBC Training Options

- **Two day comprehensive training** including concepts, requirements, compliance paths, Proficiency Test

Target Group: Architects, Energy Professionals, Consultants

- **Half-day training** focused on demonstrating ECBC compliance

Target Group: Code Compliance Officers

ECBC Proficiency Test

- **Objectives**

- Evaluate knowledge acquired by the trainee through the training
- Assess whether the trainee could be considered as ECBC Proficient Professional
- Create a Panel of BEE Certified ECBC Professionals

- **Proficiency Test**

- To be administered by BEE
- Two hour examination
- Multiple Choice Questions – One Set prepared by ECO-III
- Need for setting up test papers annually
- Need for developing a panel of test examiners

Thank You

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