



ECONirman ECBC Conformance Check Tool

(www.buildingenergytools.in/econirman)

Background

The Government of India, under the provision of the Energy Conservation Act, 2001, launched Energy Conservation Building Code (ECBC) in May 2007 for its voluntary adoption in the country. Since then Bureau of Energy Efficiency (BEE) has been promoting the implementation of ECBC through several capacity building programs. USAID supported ECO-III Project has been working closely with BEE in these initiatives, and has developed ECBC User Guide and ECBC Tip Sheets for raising awareness among stakeholders on ECBC. During these capacity building efforts, a strong need has been felt to assist architects and engineers at the design stage so that they are able to assess the performance of their proposed buildings with respect to ECBC and accordingly facilitate design improvements. With this objective, ECO-III Project in consultation with BEE has conceived the development of ECONirman, an online ECBC Conformance Check Tool.

ECONirman - Introduction

ECONirman has been designed for assessing the conformance of commercial buildings, which fall under the purview of ECBC. It covers all commercial buildings having an electrical connected load of more than 100 kW or contract demand of 120 kVA (the amended threshold values for ECBC compliance). ECBC Conformance Check Tool:

- assists the user in finding out if the building conforms to the requirements of ECBC, keeping in view five climatic zones in India as specified in ECBC
- assesses the overall conformance of building as well as its major building systems which include Building Envelope, HVAC, Lighting, Service Water Heating & Pumping and Electrical Power Systems

- has been developed as a web-based application to ensure that it reaches a wide spectrum of users across the country

Salient Features

ECONirman takes into account both the mandatory and prescriptive requirements of ECBC. It asks the users to input building information such as site location, type of building, its connected load or contract demand and other technical details of the building systems. ECONirman:

- assesses the conformance of the building based on mandatory and prescriptive requirements
- offers the option of checking the conformance of building envelope through "Trade-off Method"
- generates Building's ECBC Conformance Report which compiles data fed by the user and also indicates which systems and sub-systems of the building are 'conforming' or 'not conforming' to ECBC
- has the option of including data on a number of building projects which can be saved under a single user profile
- stores information in a central database for future reference, review, editing and analysis by the user and can provide assistance in case of loss of authentication information
- is available in public domain for easy access to the users (www.buildingenergytools.in/econirman)

Though ECBC has the provision of assessing the performance through "Whole Building Performance Method", the Tool in its present version is not equipped to do this. ECO-III aims to incorporate this in the next version of the Tool.

The screenshot displays the ECONirman web application interface. At the top, there are logos for USAID India, ECONirman, and BEE. The page title is "ECBC Conformance Check Tool". The date and time are "04:20 PM | Monday, November 29, 2010 (Beta Version)". There are navigation tabs for "List", "Project", "Envelope", "HVAC", "SHWP", "Lighting", and "Electrical Power". The "Project" tab is selected. Below the tabs, there are sections for "Owner/Agent" and "Designer/Contractor". The "Location" section includes dropdowns for "States and Union Territories" (Karnataka) and "City" (Bangalore Urban district), a "Climate Zone" (Temperate), and "Latitude/Longitude" (12°59' N / 77°40' E). A map of India is shown. The "Project Type" section has radio buttons for "24 Hour Use Building" and "Day-time Use Building". The "Project Details" section includes "Building Name" (Wizemon Software Technology Park), "Building Type" (Office), "Built-up Area" (85000 m²), "Specify Load/Demand" (Contract Demand), and "Contract Demand" (530 kVA). The "Conformance Option" section has a radio button for "Prescriptive Compliance Check" and a link for "Whole Building Performance (Appendix B in the ECBC)". The "Site Details" section includes "Description" (Upcoming Software Technology park), "Address" (Outer ring Road Vidhan Sauda), "City" (Bangalore), and "Pin Code" (492343). The "Approval" section includes "Approval Number" (BANG-45689) and "Approval Date" (2010-11-06). A "Save" button is at the bottom left. On the right, there is a "Project Guidelines" section with instructions on how to use the form.

Review by Stakeholders

ECO-III Project sent the Beta version of ECONirman to various stakeholders for review and sought their comments to improve its user friendliness. The feedback received greatly helped in refining the user interface, conformance reports, and cross module validations. The following organizations have provided invaluable feedback to the ECO-III project:

- 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

ECONirman User Manual

ECO-III has also developed ECONirman User Manual that provides assistance for on-line submission of data and generation of building conformance report. It can be downloaded from <http://eco3.org/ECONirman-User-Manual.pdf>

ECONirman Development Team & Partners

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The screenshot shows the ECONirman software interface. At the top, there are logos for USAID India, ECONirman, and Energy is Life. The main area displays a table of building parameters for Envelope Conformance. The table includes columns for Parameter, Description, *Gross Area (m²), *Insulation R-Value (m²·K/W), *U-Factor (W/m²·K), *SHGC, and Select to delete. Below the table, there is a summary table and a 'Check Envelope Conformance' button.

Parameter	Description	*Gross Area (m ²)	*Insulation R-Value (m ² ·K/W)	*U-Factor (W/m ² ·K)	*SHGC	Select to delete
Roof						
Flat Roof-01	10 cm RCC	400.0	4.0	0.23		Edit
Sloped Roof-01	0.625 cm AC sheet + air space + 2.5 cm sandwich of fibre board/ expanded polystyrene	500.0	4.2	0.21		Edit
Cool Roof-01	Slope of the roof is 10 degrees Solar Reflectance is 0.70 Emissance is 0.75					Edit
Skylight						
Skylight Metal Frame-01	Double Pane Skylight does not have curb	5.0		6.9	0.23	Edit
Opaque Wall						
Opaque Wall-01	Cement Plaster + Brick Wall + Insulation Cement Board	500.0	5.0	2.8		Edit
Opaque Wall-02	AAC (Autoclave Aired Concrete) + Insulation + Gypsum	700.0	6.0	2.4		Edit
Opaque Wall-03	Cement Plaster + Brick Wall + Air Gap + Brick Wall + Cement Plaster	400.0	4.0	2.1		Edit

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



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