

## Advanced Training Programme on Green Buildings



ITC Green Centre, Gurgaon  
Platinum Rating



IGP Office Complex, Gulbarga  
Gold Rating



CII - Godrej GBC, Hyderabad  
Platinum Rating



GMR-HIAL, Hyderabad  
Silver Rating



KBL Corporate Office, Pune  
Platinum Rating

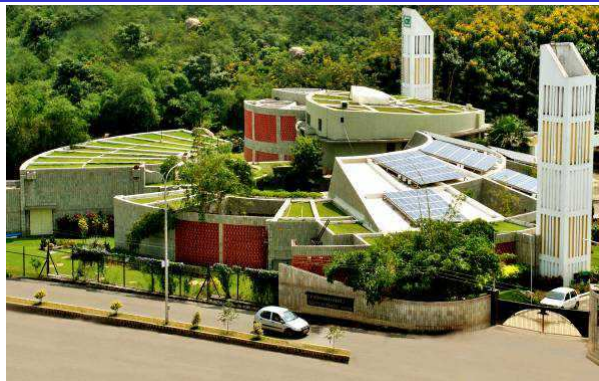


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## CII – Sohrabji Godrej Green Business Centre, Hyderabad

A unique Public – Private Partnership  
( CII, Govt of Andhra Pradesh, USAID and Pirojsha Godrej Foundation )



Centre of "Excellence" for Energy, Environment, Green Buildings, Renewable energy, Water & Climate change activities in India



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## Indian Green Building Council (IGBC)

❖ **IGBC formed by CII in 2001**

❖ **Vision of IGBC**

- **Enable 'sustainable built environment for all'**
- **India to be one of the global leaders in sustainable built environment by 2025**



Indian Green Building Council  
*Greening India since 2001*



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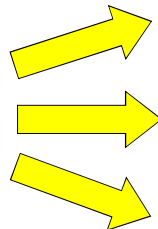


## Green Building Movement in India



2001, 1 Green Building, 20,000 sq. ft.

**In 2001,  
1 Green Building  
20,000 sq.ft.**



**(3,976 Green Projects)  
4.5 Billion sq.ft.**



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## Green Building Movement in India

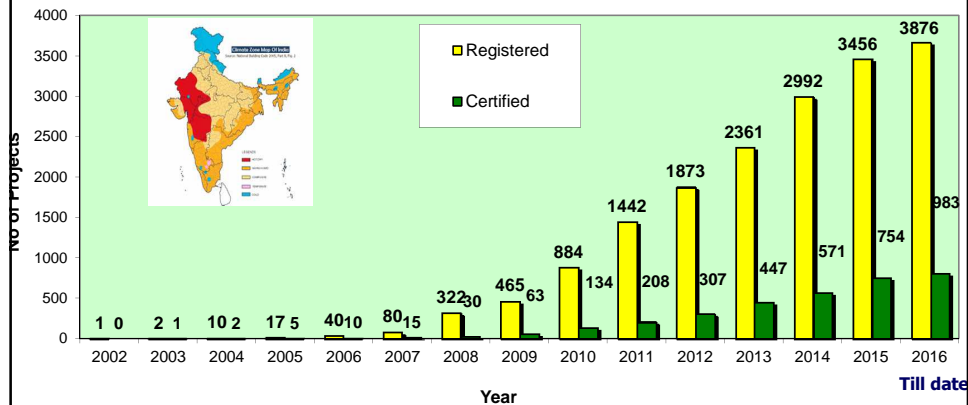
S No	Criteria	2001	→ Till date
1	CEOs & senior people involved	50	≈ 12,000
2	No. of professionals trained on Green Building concepts	10	≈ 25,000
3	No. of registered Green Buildings Built – in Area (sq.ft)	1 20k	3,976 4.5 Billion
4	Green Building products & equipment	5	150
5	IGBC Member Organisations <i>(Founding Members)</i>	0	1,809 <i>(147)</i>
6	IGBC Local Chapters	0	22
7	IGBC Accredited Professionals	0	2,323



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## Growth of Green Buildings over the years



### All types of buildings over the country :

**Airports, Banks, Colleges, Convention Centres, Factories, Hospitals, Hotels, Institutions, IT Parks, Offices, Residential, Schools, SEZs, Townships . . .**



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## What is Green?

Pursuit of an activity ...



Energy Efficiency



Use of Recycled/recyclable Products



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## What is Green?



Use of Renewable Energy



Water efficiency

**Ultimately leads to  
Sustainable Development**



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## Sustainable Development

Use of Resources to meet our needs without depriving the resources for future generations



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## Green Building Vs Conventional Building

- ❖ Externally : Both look alike
- ❖ Building Use : Both are same
- ❖ Differences
  - Conserve natural resources
  - Concern for human comfort & indoor environment
  - Operational savings



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## Tangible Benefits

- ❖ Reduce operating costs
- ❖ Optimize life cycle economic performance



- Sustained savings

- ❑ Energy savings: 30 – 50 %
- ❑ Water savings: 20 – 30 %
- ❑ Reduction in initial investment



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## Benefits Experienced in Green Buildings

- ❖ First 3 Platinum buildings monitored to validate tangible benefits
- ❖ Benefits far exceeding the initial estimates

Building	Sq.ft	Normal Building (kWh)	Actual Building (kWh)	% Reduction	Annual Energy Savings (Rs in Lakhs)
Wipro	1,75,000	48,00,000	31,00,000	40%	102
ITC	1,70,000	35,00,000	20,00,000	45%	90
CII Godrej GBC	20,000	3,50,000	1,30,000	63%	9

- ❖ Energy consumption depends on
  - Local climate, Density of occupancy, Occupancy schedule, Orientation of the building, Internal loads



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## Intangible Benefits of Green Design

### ❖ Environmental benefits

- Reduce impact on the environment

### ❖ Health and Safety benefits

- Enhance occupant comfort

### ❖ Improve Productivity of occupants



TCS Technopark, Chennai  
Gold rating

**World Class Standards & Procedures**



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## Do Green Buildings Cost More?

### ❖ Depends on green features already considered & level of rating

### ❖ First cost Vs Life cycle cost

**Operational savings offset incremental cost**



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## Cost of Green Buildings Indian Experiences

Building	Year awarded	Built-in Area (sq.ft)	Rating Achieved	% increase in cost	Payback (Yrs)
CII-Godrej GBC, Hyderabad	2003	20,000	Platinum	18 %	7 years
ITC Green Centre, Gurgaon	2004	1,70,000	Platinum	15 %	6 years
Wipro, Gurgaon	2005	1,75,000	Platinum	8 %	5 years
Technopolis, Kolkata	2006	72,000	Gold	6%	3 years
Spectral Services Consultants Office, Noida	2007	15,000	Platinum	8%	4 years
Kalpataru Square	2008	3,00,000	Platinum	2%	2 years
Suzlon One Earth, Pune	2010	8,00,000	Platinum	2%	2 years

- ❖ Cost showing a decreasing trend over the years
- ❖ Incremental Cost lower if base design has already factored normal Green features



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## What Green buildings did differently

- ❖ **Integrated design**
  - Team effort
- ❖ **Holistic approach**
  - Focus on Materials, IAQ, Site
  - Not only Energy & Water
- ❖ **Bettering the standards**
  - NBC, ECBC / ASHRAE, IPMVP, SMACNA
- ❖ **A/C & Indoor air comfort**
  - 600 sq.ft /TR in IT Parks
    - Infosys, Hyderabad
  - Chiller CoP higher than initial design
    - > 6.1 (ITC, etc.,)
  - Solar air-conditioning
    - Turbo Energy, Chennai
  - Passive cooling
    - Aquamall, Dehradun



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## What Green buildings did differently

### ❖ New Technologies / Products

- Waterless urinals
- Root Zone treatment systems
- Light pipes
- Wide-spread use of flyash blocks
- Insulated walls, roof, glazing
- Low emitting materials – Paints, Sealants, Adhesives



### ❖ Resource reuse

- Reuse of used furniture
  - Eg., ITC Green Centre, Wipro, Turbo Energy



### ❖ Use of specialised tools

- Simulation – Energy, Lighting



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## IGBC Green Buildings Rating Systems

- ❖ Defines Green Building
- ❖ Recognizes achievement on Green
  - Considers Local conditions
- ❖ Transform Markets to Green & Green products



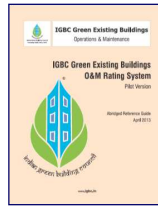
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# IGBC Green Rating Systems



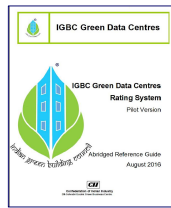
**Green New Buildings**



**Green Existing Buildings**



**Green Interiors**



**Green Data Centres**



**Green Healthcare**

## Commercial



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# IGBC Green Rating Systems



**Green Schools**

## Educational

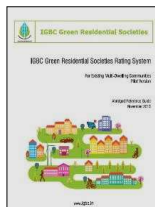


**Green Factory**

## Industrial



**Green Homes**



**Green Residential Societies**

## Residential



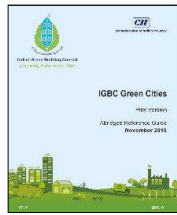
**Green Township**



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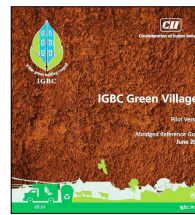
# IGBC Green Rating Systems



**Green Cities**

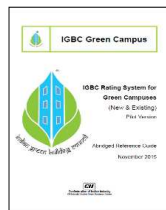


**Green Landscape**



**Green Villages**

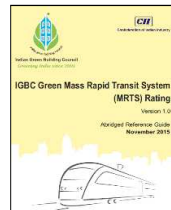
## Infrastructure



**Green Campus**



**Green SEZ**



**Green MRTS**



**Green Existing MRTS**

## Campus

## Transit



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# IGBC Green New Buildings

## Points for Individual Modules

	Modules	Possible Points
1	<b>Sustainable Architecture and Design</b>	<b>5</b>
2	<b>Site Selection and Planning</b>	<b>14</b>
3	<b>Water Conservation</b>	<b>18</b>
4	<b>Energy Efficiency</b>	<b>28</b>
5	<b>Building Materials and Resources</b>	<b>16</b>
6	<b>Indoor Environmental Quality</b>	<b>12</b>
7	<b>Innovation and Development</b>	<b>7</b>
	<b>Total</b>	<b>100</b>

**Complying with Prerequisites is mandatory for all IGBC Green New Buildings**



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## National Standards as Baselines

- ❖ National Building Code
- ❖ Energy Conservation Building Code
- ❖ Renewable Energy Certificates (RECs)
- ❖ MoEF Guidelines
- ❖ Uniform Plumbing Code of India
- ❖ Central Ground Water Board guidelines
- ❖ Central Pollution Control Board guidelines



## IGBC Green New Buildings Certification Levels

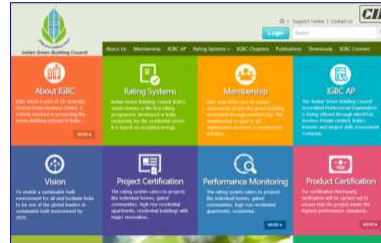
Rating	Points	Recognition
Certified	40 – 49	Best Practices
Silver	50– 59	Outstanding Performance
Gold	60 – 74	National Excellence
Platinum	75– 100	Global Leadership



# Project Registration

## ❖ Online Registration

➤ [www.igbc.in](http://www.igbc.in)



## ❖ Resources for Registered projects

- Free Reference Guide
- Master Templates
- 2 Free CIRs (Credit Interpretation Rulings)

## ❖ When to register

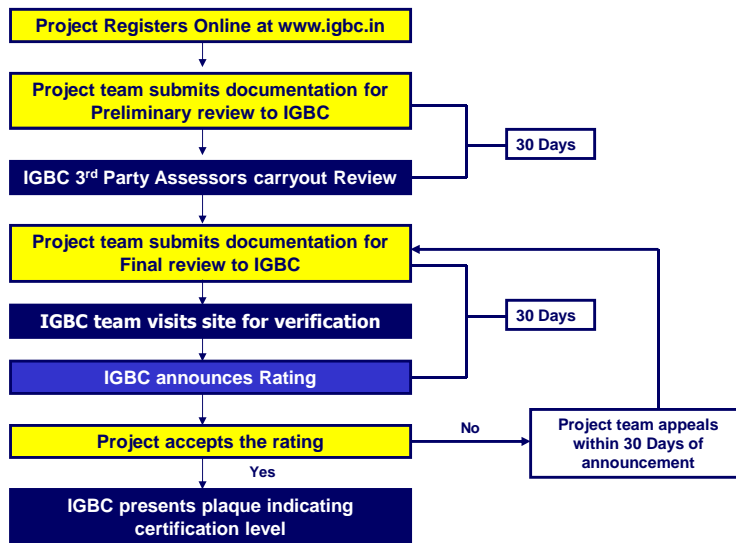
- Can register at any stage
  - Registration at early phase – maximum potential for achieving certification



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# IGBC Certification Process



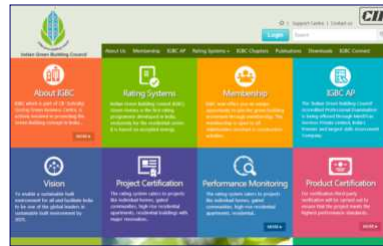
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## IGBC Online

### ❖ Project Registration to Certification

- Simple and user-friendly
- Paper less work
- Display of review timelines



### ❖ Online payment process



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## IGBC Accredited Professional Exam

### ❖ Objective

- Recognise holistic understanding of green building concepts
- Meet the demand for qualified Indian Green building professionals



### ❖ On-line Examination

- Registration to Result
- 2,323 qualified professionals
- 500 professionals taking up in next 5-6 months



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## To Sum Up

### ❖ Green Buildings

- Excellent opportunity to reduce operating costs from day one

### ❖ Tremendous benefits

- Tangible & Intangible

### ❖ Long term benefits



**"Green makes Business Sense"**

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**Go Green!**  
**Visit [www.igbc.in](http://www.igbc.in)**