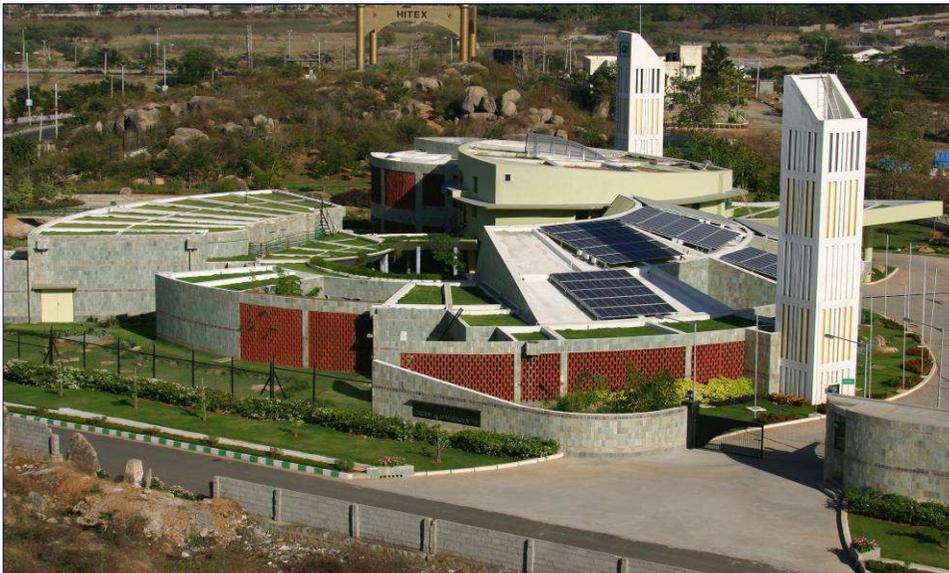


Green Building Movement in India

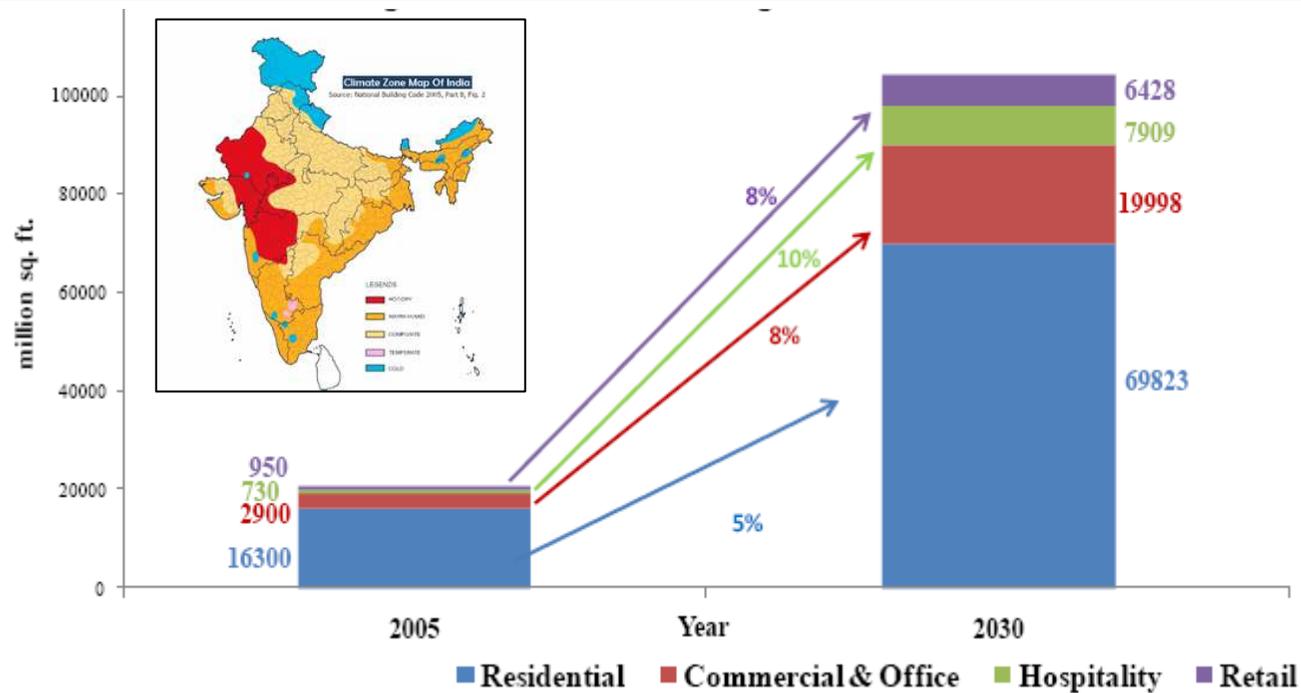
Seminar on Application of Glass in Green Buildings

Hyderabad, 26 June 2012



Building Sector - Expected Growth

Year	2012	2020	2030
Built-up Area (Billion Sq.ft.)	25	50	100



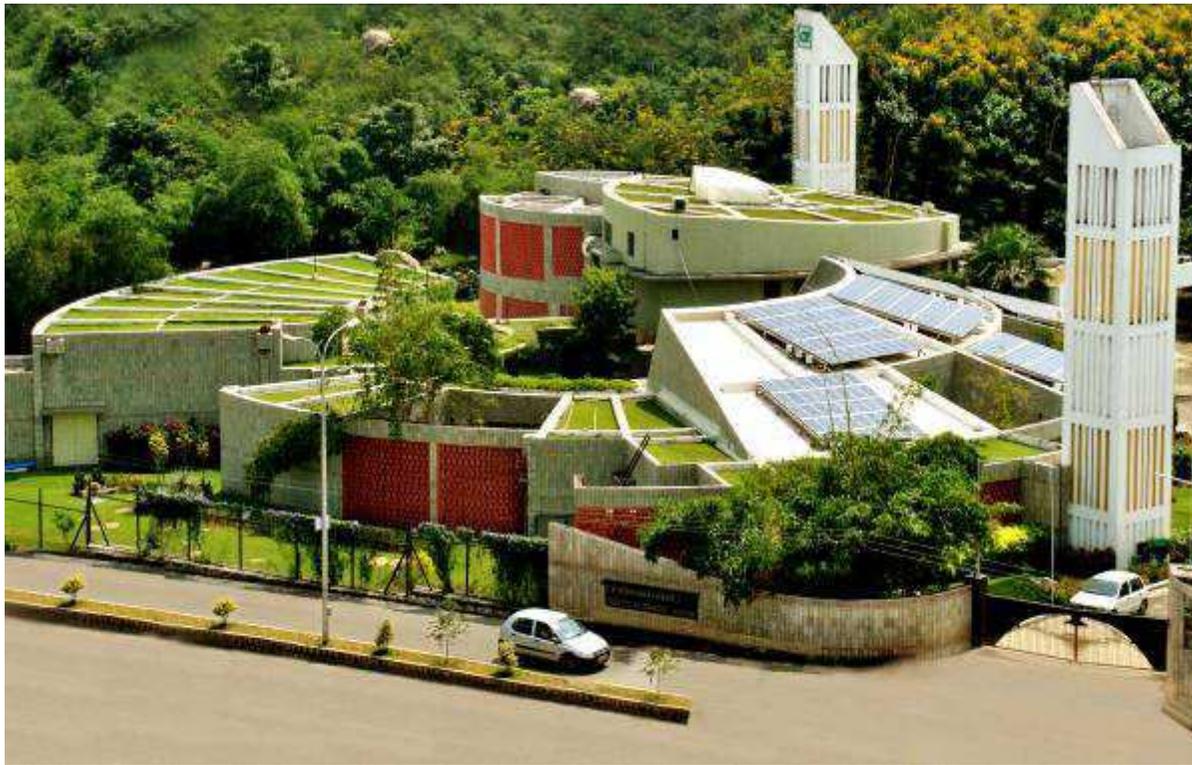
(Source – Climate Works Foundation)

© Confederation of Indian Industry



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

IGBC Vision

❖ Vision for 2025

- **Enable Sustainable Built-Environment for ALL**
- **Facilitate India to be one of the world leaders in Sustainable Built-Environment by 2025**



Green building registration crosses 1 billion sq.ft

Our Bureau

Pune, March 15

The Indian Green Building Council (IGBC) has achieved a major milestone by crossing one billion sq.ft of registered building area comprising 1,505 projects. Of these, 436 are green home projects (2,96,000 houses) amounting to a built-up area of over 443 million sq. ft, Mr V. Suresh, former CMD, HUDCO & Principal Executive Officer HIRCO, said.

He was speaking at the CII National Conference on 'Green Homes here. He added that the past 3-5 years had witnessed major growth in Indian building sector and the demand for constructed space is expected to rise from 20 billion sq. ft to 100 billion sq. ft in next 20 years.

The conference also saw the launch of the advanced IGBC Green Homes Rating System

(Version 2.0) of CII by Mr Naresh Zurmure, Additional Municipal Commissioner (Gen.) Pune Municipal Corporation. The rating system comes into effect immediately.

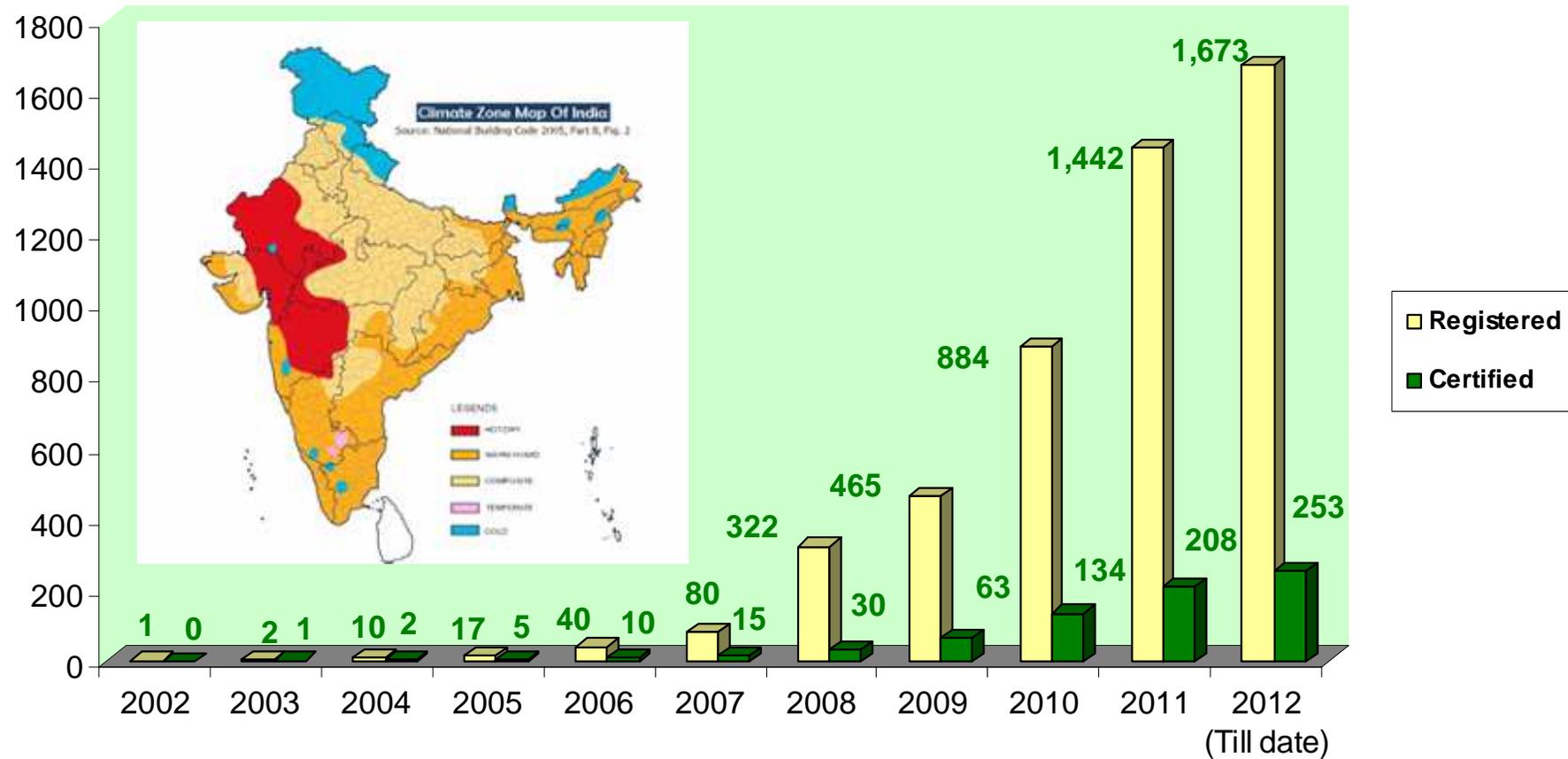
In his keynote address, Mr Lalit Kumar Jain, Chairman, IGBC Pune Chapter and President, CREDAI, said that an MoU has been inked between CREDAI and IGBC to strengthen the green building movement in India. "Within the last one week in Pune, over 10 CREDAI members have registered 21 projects over 15 million sq.ft with IGBC," he said.

The Conference on Green Homes 2012 is organised in partnership with the Ministry of New and Renewable Energy (MNRE), Confederation of Real Estate Developers' Associations of India (CREDAI), and Indian Institute of Architects (IIA).



India stands Second in the global green building footprint

Growth of Green Buildings



All types of buildings, all over the country :

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

Green Building Movement in India

S No	Criteria	2001	→ Till date
1	CEOs & senior people involved	50	≈ 10,000
2	No. of professionals trained on Green Building concepts	10	≈ 17,000
3	No. of registered Green Buildings Built – in Area (sq.ft)	1 20k	1,673 1.19 Billion
4	Green Building products & equipment	5	120
5	IGBC Member Organisations <i>(Founding Members)</i>	0	1,262 <i>(113)</i>
6	IGBC Local Chapters	0	12
7	IGBC Accredited Professionals	0	820

Rating Programmes to Suit Different Building Types

❖ One single rating cannot be applied to suit all building types

❖ Programmes launched

- IGBC Green Homes
- IGBC Green Factory Buildings (Pilot)
- IGBC Green SEZs (Pilot)
- IGBC Green Townships (Pilot)
- LEED 2011 for India

New Construction

Core & Shell

❖ Other Programmes on the anvil

- IGBC Landscape *

* Rating under development



Rating programs aligned with:



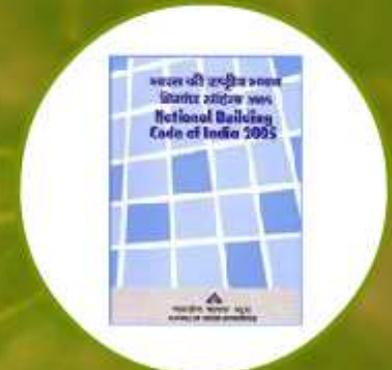
MoEF
Government of India



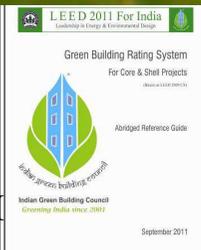
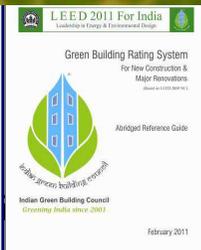
BEE
Star Rating Programme



Energy Conservation Building Codes (ECBC)



National Building Code of India



Key Drivers for Green Buildings

Study by McGraw-Hill Construction

❖ Motivation for Green Buildings

➤ Business reasons

- The right thing to do
- Market and client demands

➤ Social reasons

- Encourages sustainable building practices
- Promotes greater health and well-being

➤ Environmental Reasons

- Reduce energy consumption
- Lower green house gases
- Indoor air quality



MICROSOFT CAMPUS, Hyderabad
LEED Gold Rated



Innovative & Emerging Trends



© Confederation of Indian Industry



Solar Air-conditioning

- ❖ **90 TR hot water fired VAM system**
 - **36,000 sq.ft**
- ❖ **Reduction in HVAC electrical load**
 - **117 kW**



Turbo Energy Limited, Chennai

© Confederation of Indian Industry

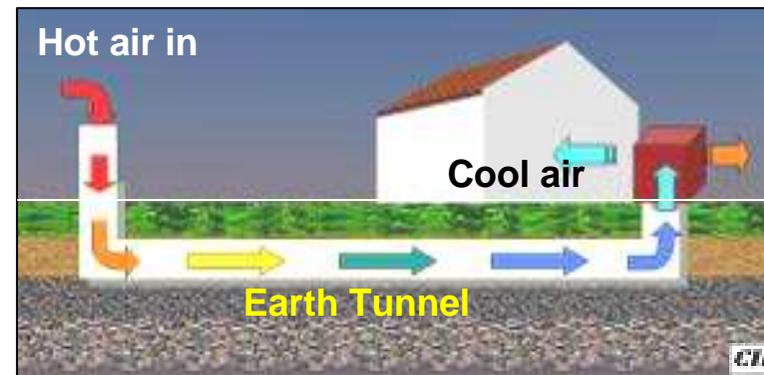


Earth Air Tunnels & Passive Cooling

- ❖ **Office-cum-assembly unit**
 - **30,000 sq.ft**
- ❖ **Extension of Geothermal cooling**
- ❖ **Temperature reduction up to 8-10 deg C, possible**

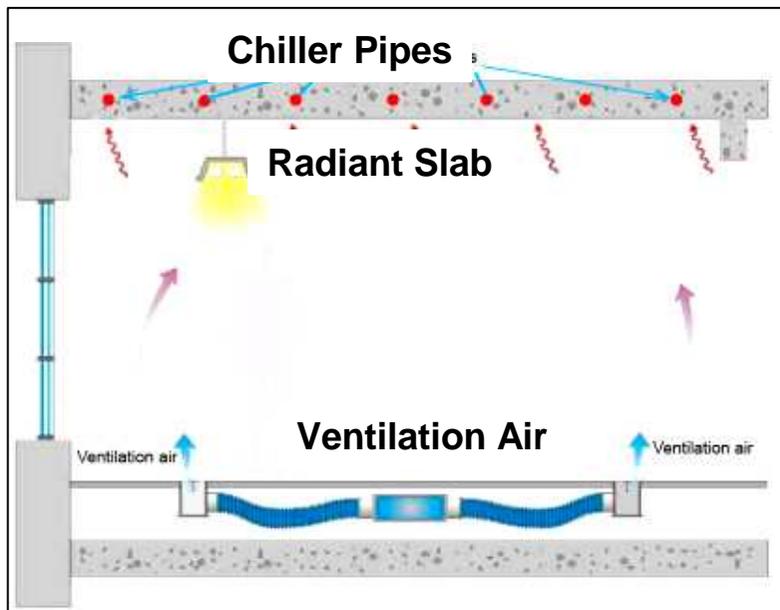


Earth Tunnel Cooling Aquamall, Dehradun



Radiant Cooling Technology

- ❖ **IT complex**
 - **160,000 sq.ft**
- ❖ **30-40% better efficiency**
 - **Possible CoP : 8**



Infosys, SDB-1, Pocharam campus, Hyderabad



Energy Efficient – Equipment & Systems

The Trend

Past



COP 3-4
100 sq.ft / TR

Present



COP 5-6
450 sq.ft / TR

Future



COP 8-10
700 sq.ft / TR



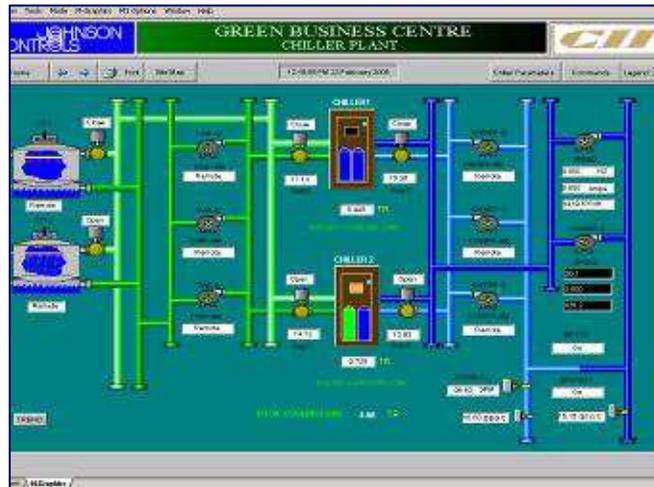
Controls & Monitoring system

Past



Manual Controls

Present



BMS

Future



**Remotely
Operated
& Monitored**

Net-Positive Energy Buildings



Present

High Performance building



Future

Net Positive ! Export Power



Net-Zero Energy Building

- ❖ **Project : Eco-Commercial Building, Greater Noida**
 - **20,000 sq.ft**
- ❖ **Solar PV Capacity : 56 kW**
- ❖ **Energy Demand & Supply :**
 - **Requirement : 79,000 kWh / year**
 - **RE Generation : 89,000 kWh/ year**



Eco-Commercial Building, Greater Noida



Installation of Solar PVs



"Green Cities"



**Present:
Green Buildings**



**Future:
Green Cities**

Government & IGBC



© Confederation of Indian Industry



Government & IGBC...

❖ Ministry of Environment and Forests (MoEF) Notification on Green Buildings

- **Faster Environmental Clearance to projects applying for IGBC Green Building Certification**



No. 19-58/2011-IA.III
Government of India
Ministry of Environment & Forests

Paryavaran Bhavan,
C.G.O. Complex, Lodi Road,
New Delhi-110003.
Telefax. 2436 2434

Dated the 27th June, 2011

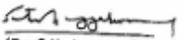
OFFICE MEMORANDUM

Sub: Out of turn consideration for environmental clearance in respect of Building and Construction Sector Projects having green rating – Regarding.

Ref: Office Memorandum no. 19-58/2011-IA.III dated 10.5.2011 issued by Ministry of Environment & Forests

In continuation to this Ministry's earlier Office Memorandum of even no. dated 10.5.2011 regarding the subject mentioned above, it has been decided that the proposals for obtaining environmental clearance in respect of Building and Construction Projects which have obtained Green Building rating (Pre-Certification or Provisional Certification) under the rating programmes of GRIHA, IGBC including LEED India etc by integrating high level of environmental norms into their building plans, shall get priority for their consideration, out of turn, by the Expert Appraisal Committee / State Level Expert Appraisal Committee, as the case may be. A copy of this certificate along with the details of examination done by above agencies shall be submitted along with the project. Therefore, such projects will be listed for their consideration by the EAC / SEAC concerned, out of turn, as compared to other cases.

This issues with the approval of the Competent Authority.


(Dr. S.K. Aggarwal)
Director

To

1. All the Officers of IA Division
2. Chairpersons / Member Secretaries of all the SEIAs/SEACs
3. Chairman, CPCB
4. Chairpersons / Member Secretaries of all SPCBs / UTPCCs

Copy to:-

1. PS to MEF
2. PPS to Secretary (E&F)
3. PPS to SS(JMM)
4. Advisor (NB)
5. Website, MoEF
6. Guard File



Government & IGBC...

❖ Additional FAR of 5% for IGBC rated Green Buildings by NOIDA

- Plot size of 5,000 sq.m and above
- To achieve a minimum of Gold rating

Uttar Pradesh Shasan
Audyogik Vikas Anubhag-4

In pursuance of the provisions of clause (3) of Article 348 of the Constitution, the Governor is pleased to order the publication of the following English translation of notification no **2159 /77-4-10-284 Bha./91**, dated 20 December, 2010

Notification

No- 2159/77-4-10-284bha/91

Lucknow : Dated 20 December, 2010

(14) The applicant who shall construct Green Building on a plot of 5000sqmtrs and above may be allowed an additional FAR of 5% of the permissible/ awailed FAR (excluding additional 15% FAR for services), free of cost, provided that the applicant fulfils the following conditions:-

- (i) The Building is completed and rated by Leadership in energy and Environmental Design (LEED) as 'Gold or Platinum'.
- (ii) The Building is recommended by the Bureau of Energy Efficiency Government of India for the provision of energy efficiency.
- (iii) The Building has been completed fulfilling the parking and landscaping norms of the prevailing regulations.
- (iv) The applicant has made sufficient provisions for using the additional FAR.

Note : The applicant has to submit a certificate of compliance of green building from Leadership in energy and Environmental Design (LEED)/ Bureau Energy of Efficiency after every three years. In case he fails to submit this certificate the Authority, after giving him one month notice, may charge the compounding fees of the FAR given free of cost at the rate of 200% of the cost of purchasable FAR.



Govt of Maharashtra

❖ Green Building Guidelines for Maharashtra

- Projects with built-up area more than 20,000 sq.m to get fast track MoEF clearance

EXPRESS NEWS SERVICE
MUMBAI, MARCH 9

ALL development of areas in excess of 20,000 sq ft will have to follow norms on green and eco-friendly buildings, Chief Minister Prithviraj Chavan announced on Friday.

After a presentation on 'green buildings' at state guest house Sahyadri, Chavan said the state government would incentivise construction of green buildings by rewarding those developers who minimise use of electricity through optimum use of sunlight, install water and rain-water recycling systems and use eco-friendly materials in construction. Detailed guidelines would be drafted soon, he said.

Representatives of the Confederation of Indian Industry (CII), which signed an agreement with the government in 2010 for a 'Green Card' project, made a presentation on the subject to the chief minister. Chavan later said that to boost the adoption of eco-friendly measures in the construction industry, the government will start with ensuring that all construction and repairs to public offices and government buildings adhere to the green building norms. While some green-building rules would be made mandatory for all developers, others would be optional, with incentives promised to builders adopting the optional measures as well.

The state, which has a little over 350 such buildings, accounts for 30 per cent of the country's green buildings.

PRITHVIRAJ CHAVAN

Green Building Congress 2012

10th Edition

Green Building Congress 2012

India's Flagship Event on Green Buildings

International Conference & Exhibition on Green Buildings

30 Oct - 1 Nov 2012

HICC, Hyderabad, India

Asia's Largest Green Building Conference & Exhibition



30 Oct – 01 Nov 2012, Hyderabad



© Confederation of Indian Industry



To Sum Up

❖ Green Buildings

- Excellent opportunity to reduce operating costs from day one

❖ Paradigm shift in building design

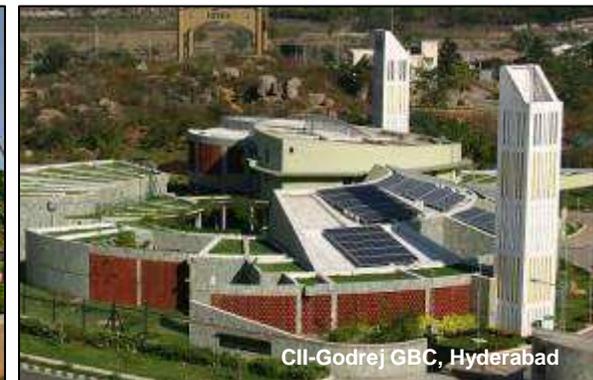
❖ Tremendous benefits

- Tangible & Intangible



***'A Green building creates
Delight when you enter,
Serenity and health when occupied &
Regret while you depart'***

– 'Natural Capitalism'





Go Green!

Visit www.igbc.in

Need for Green Buildings

❖ **Building & Construction sector – a major contributor to global warming**

- **25 – 40% of global energy consumption**
- **30 – 40% of Global Green House Gas Emissions**
- **30 – 40% of solid waste generation**

Source: UNEP Sustainable Building and Construction Initiative 2006

