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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

**What is a Green Building?**

- ❖ **Conventional & Green Building**
  - **Functionality & appearance - both are same**
- ❖ **Difference is in approach**
  - **Concern for Resource conservation & human productivity**



**Green Building Features**


**Incorporates several Green Features**

1. **Efficient Use of Water**
2. **Energy Efficient & Eco Friendly Equipment**
3. **Use of Renewable Energy**
4. **Building automation**
5. **Use of Recycled/Recyclable Materials**
6. **Indoor environment quality**



**Benefits Experienced**


- ❖ **Tangible**
  - **Energy upto 50%**
  - **Water upto 35%**
- ❖ **Intangible**
  - **People spend 90% of their time inside building**
    - ❑ **Productivity improvements upto 10% possible**
      - ☑ **Day-lighting**
      - ☑ **Views**
      - ☑ **Air quality (CO2 monitoring)**



**Change is Necessary**

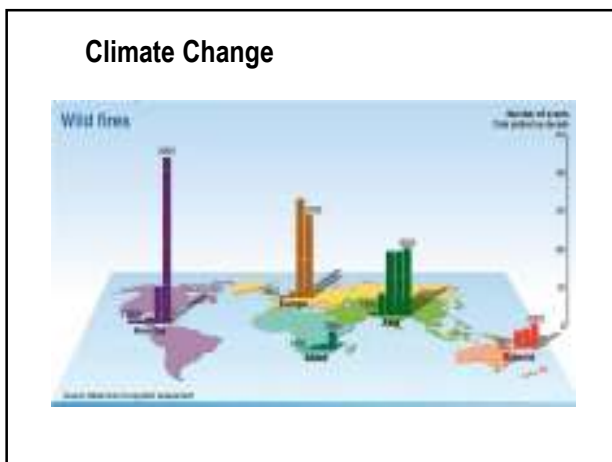
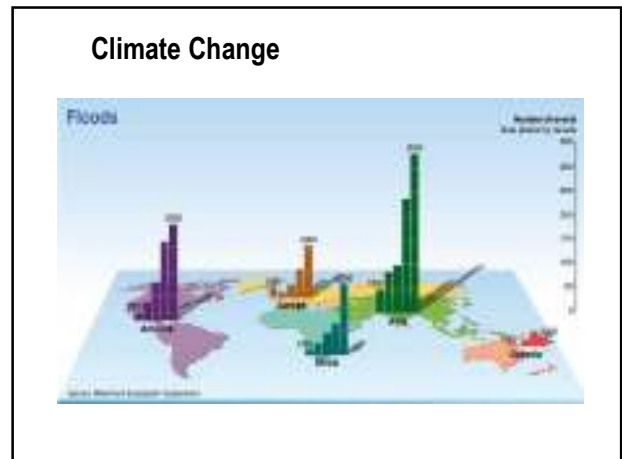
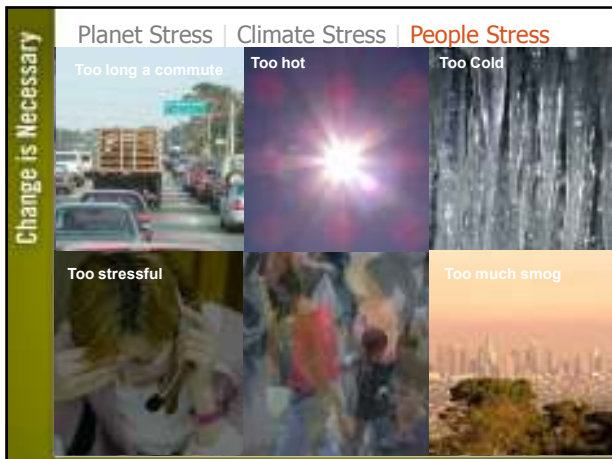
Planet Stress | **Climate Stress** | People Stress

Climate Change Implications



Drought | Arctic Ice Melt

Flood | Heat Wave | Hurricanes



### Construction industry - Impact on environment

- ❖ 20% landfill is from construction industry
- ❖ 10 % of total energy generated in the country
- ❖ 10 % of total water consumption

**Construction industry should go 'Green'**

### LEED provides a solution

Scores are tallied for different aspects of efficiency and design in appropriate categories.

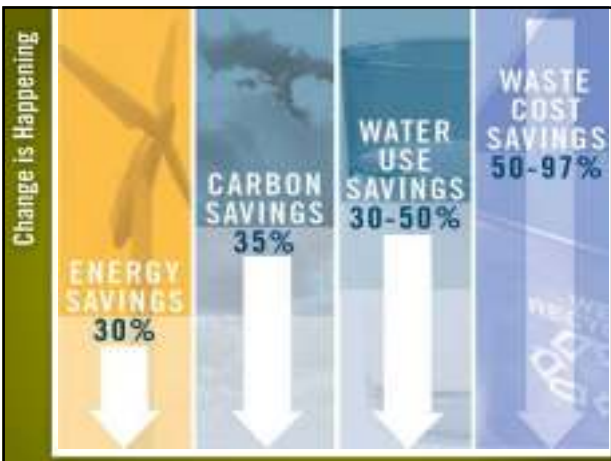
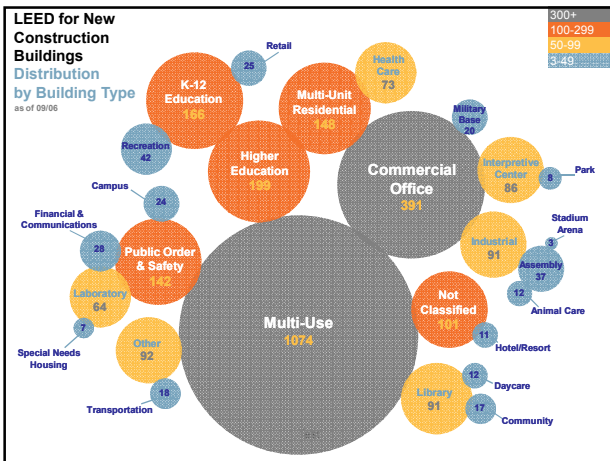
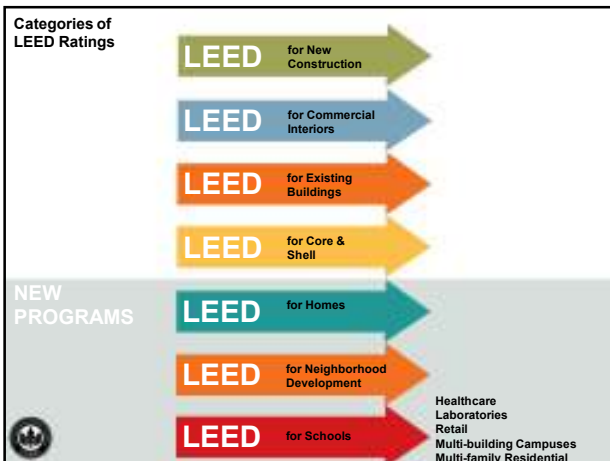
For instance, LEED-NC (New Construction) is assessed in detail for its:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Quality
6. Innovation & Design Process

**LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN**

A leading-edge system for certifying DESIGN & CONSTRUCTION of the greenest buildings in the world

Green Facts	
LEED-NC (New Construction)	100
LEED-NC (Core & Shell)	90
LEED-NC (Retail)	80
LEED-NC (Office)	70
LEED-NC (Government)	60
LEED-NC (Manufacturing)	50
LEED-NC (Healthcare)	40
LEED-NC (Education)	30
LEED-NC (Residential)	20
LEED-NC (Transportation)	10
LEED-NC (Data Center)	0





### Why Stakeholders Preferring Green Buildings

- ❖ Green Image
- ❖ Operational savings
- ❖ Above all... a sense of pride & achievement



CI-I-Godrej GBC



ITC Green Centre

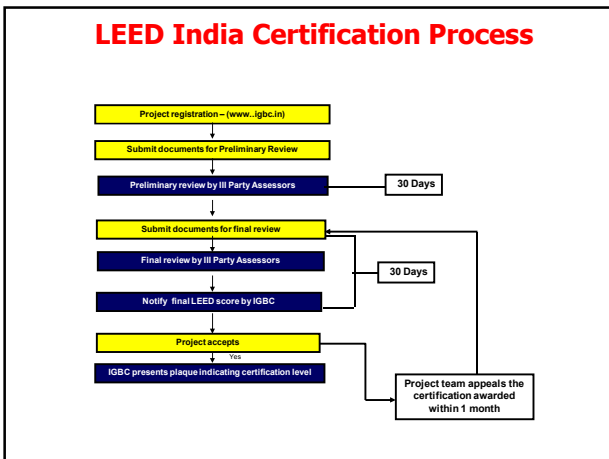
### Green Building Rating System – Certification Levels

Rating	New Construction (NC)	Core & Shell
LEED Certified	26-32	23-27
LEED Certified Silver level	33-38	28-33
LEED Certified Gold Level	39-51	34-44
LEED Certified Platinum Level	52-69	45-62

### Green Building Rating System

Points for individual Credits

S No	Credits	New Building	Core & Shell
	<b>Prerequisites</b>	<b>7</b>	<b>7</b>
1	Sustainable Sites	14	14
2	Water efficiency	5	6
3	Energy and Atmosphere	17	15
4	Materials and Resources	13	9
5	Indoor Environmental quality	15	11
6	Innovation and Accredited Professional points	5	5
	Total	69	62



### Sustainable Sites

Credit	Title	Point(s)
Prereq 1	Erosion and Sedimentation Control	Required
Credit 1	Site selection	1
Credit 2	Development Density & Community Connectivity	1
Credit 3	Brownfield redevelopment	1
Credit 4	Alternative transportation	1-3
Credit 5	Site development	1-2
Credit 6	Storm water Design	1-2
Credit 7	Heat Islands Effect	1-2
Credit 8	Light pollution reduction	1
	Total	13

## Water Efficiency

Credit	Title	Point(s)
Credit 1	Water Efficient landscaping	1-2
Credit 2	Water Efficiency in A/C systems – Reduce by 50 %	1
Credit 3	Innovative wastewater technologies	1
Credit 4	Water use reduction	1-2
	<b>Total</b>	<b>6</b>

## Energy

Credit	Title	Point(s)
Prereq 1	Fundamental system commissioning	Required
Prereq 2	Minimum Energy Performance	Required
Prereq 3	CFC reduction	Required
Credit 1	Optimize energy performance	10
Credit 2	On site Renewable Energy – 2.5%, 7.5% & 12.5%	3
Credit 3	Additional Commissioning	1
Credit 4	Ozone Depletion	1
Credit 5	M&V	1
Credit 6	Green Power-35%	1
	<b>Total</b>	<b>17</b>

## Materials and Resources

Credit	Title	Point(s)
Prereq 1	Storage and collection of recyclables	Required
Credit 1	Building reuse	1-3
Credit 2	Construction waste management	1-2
Credit 3	Resource reuse	1-2
Credit 4	Recycled content	1-2
Credit 5	Local/regional materials	1-2
Credit 6	Rapidly renewable materials	1
Credit 7	Certified wood	1
	<b>Total</b>	<b>13</b>

## Indoor Environmental Quality

Credit	Title	Point(s)
Prereq 1	Minimum IAQ performance	Required
Prereq 2	Environmental tobacco smoke control	Required
Prereq 3	Emission reduction in Captive Power Plants	Required
Credit 1	Outdoor Air Delivery Monitoring	1
Credit 2	Increased ventilation	1
Credit 3	Construction IAQ management plan	1-2
Credit 4	Low-emitting materials	1-4
Credit 5	Indoor chemical & pollutant source control	1
Credit 6	Controllability of systems, Lighting and Thermal comfort	1-2
Credit 7	Thermal comfort-Design and Verification	1-2
Credit 8	Daylighting and views	1-2
	<b>Total</b>	<b>15</b>

## Innovation & Design Credits

Credit	Title	Point(s)
Credit 1	LEED Innovation Credits	1-4
Credit 2	LEED Accredited Professional	1
	<b>Total</b>	<b>5</b>

## Suggestive Measures

### ❖ Energy Efficiency

- > High COP chillers
  - Water cooled with COP >6.4
  - Air cooled with COP > 3.0
  - VFD for Sec pumps, CT pumps, CT Fans & AHU fans
- > Heat Recover Wheels
- > Lighting power density
  - <0.80 watts/sft
  - Use LEDs, CFLs & TS lamps
- > Over Deck insulation with 75 mm Extruded polystyrene
  - R15 insulation to meet ECBC and ASHRAE
- > High performance DGU with SHGC of 0.18

Anticipating around 30% energy savings over conventional buildings

## Suggestive Measures

### ❖ Water Efficiency

- > High efficiency water fixtures
  - ❑ Dual flush toilets
  - ❑ Sensor based urinals
  - ❑ Ultra low flow taps, etc
- > Use of recycled waste water for
  - ❑ CT make up
  - ❑ Irrigation
  - ❑ Toilet flushing
- > Sprinkler and drip irrigation
- > Native plants to minimize the water requirements

Anticipating around 30% water savings over conventional buildings

## Suggestive Measures

### ❖ Indoor Environmental Quality

- > Treated fresh air with
  - ❑ MERV 13 filters (or)
  - ❑ Electrostatic filters
- > Demand controlled ventilation with CO2 sensors
- > Low VOC paints, adhesives, sealants and carpets
- > Eco friendly house keeping chemicals
- > Natural lighting is possible
- > Temperature and Humidity control

Improves productivity of occupants up to 15%



Go Green . . .