

A glass globe with a green landscape inside, resting on moss in a forest. The globe is transparent, showing a lush green scene with trees and a body of water. It sits on a bed of green moss, surrounded by various green plants and foliage. Sunlight filters through the trees in the background, creating a soft, glowing effect.

Design & Development of Green Buildings in India

LEADERSHIP WORKSHOP ON
SMART CITIES SUSTAINABLE CONSTRUCTION

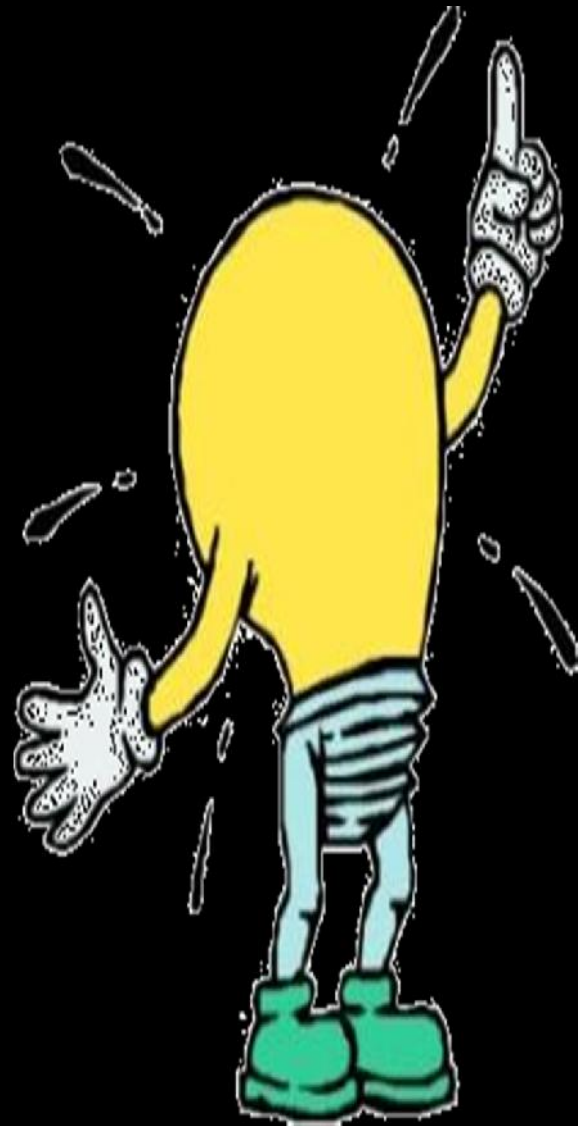
By: ASHISH JAIN, Director, AEON Integrated Building Design Consultants

What is a Green Building?

A green
Building
is not
just
green in
colour



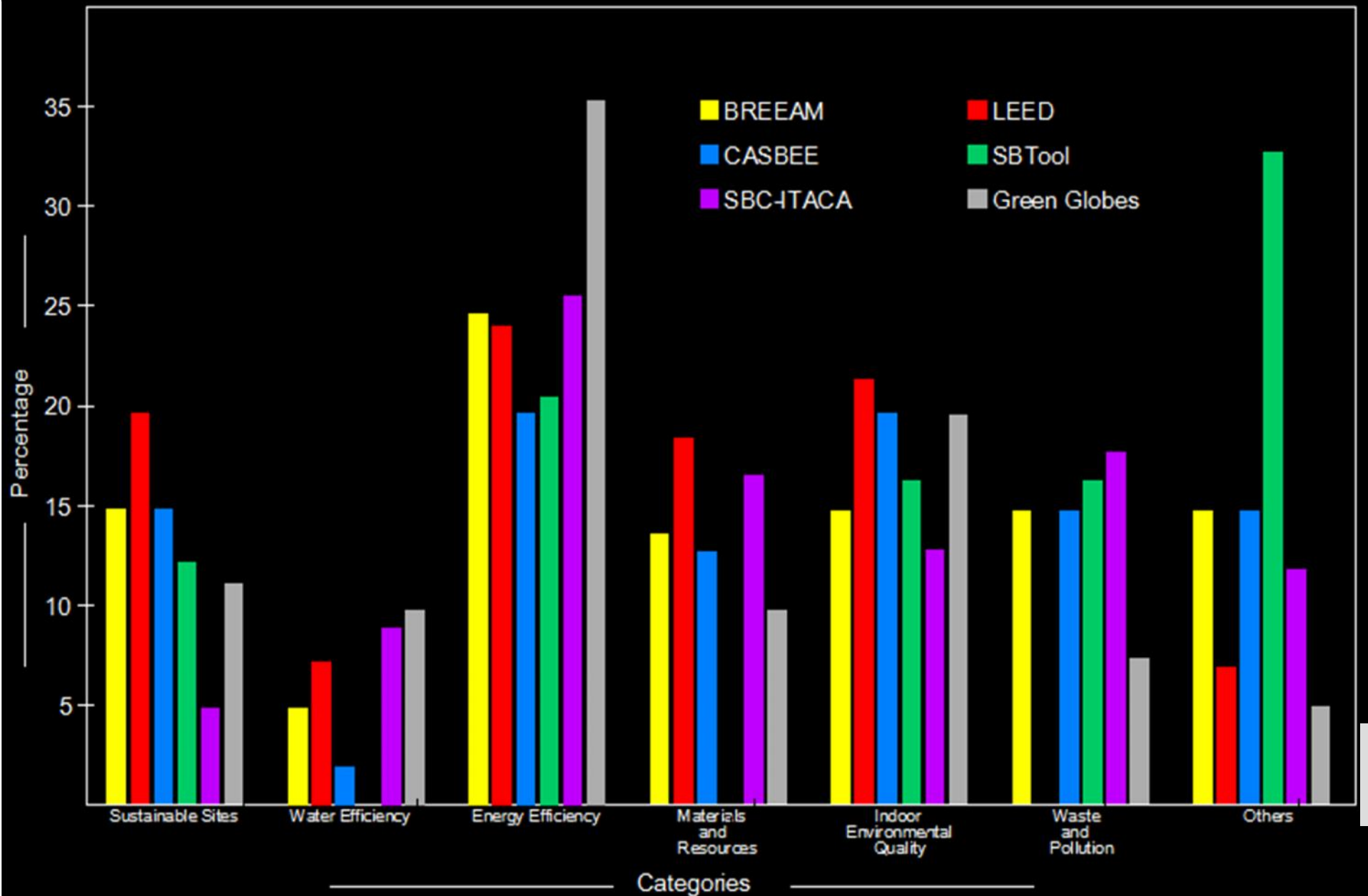
A **green**
building is
good for
your **health**
your **wallet** and
our **planet**



GREEN BUILDING RATING SYSTEMS AROUND THE WORLD



COMPARISON of GREEN BUILDING RATING SYSTEMS AROUND THE WORLD



Green Building Rating Systems providing A Framework



GREEN BUILDING RATING SYSTEMS



Part of CII which got formed in 2001.

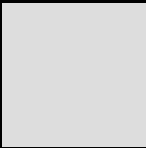


Developed by the US Green Building Council and LEED New Construction was first launched in 2000



Green Rating for Integrated Habitat Assessment
Conceived by TERI & developed jointly with the MNRE

In India, Green
Building Movement
had been started in
2001





LEED-India New Construction Rating System

- Owner Occupied Buildings

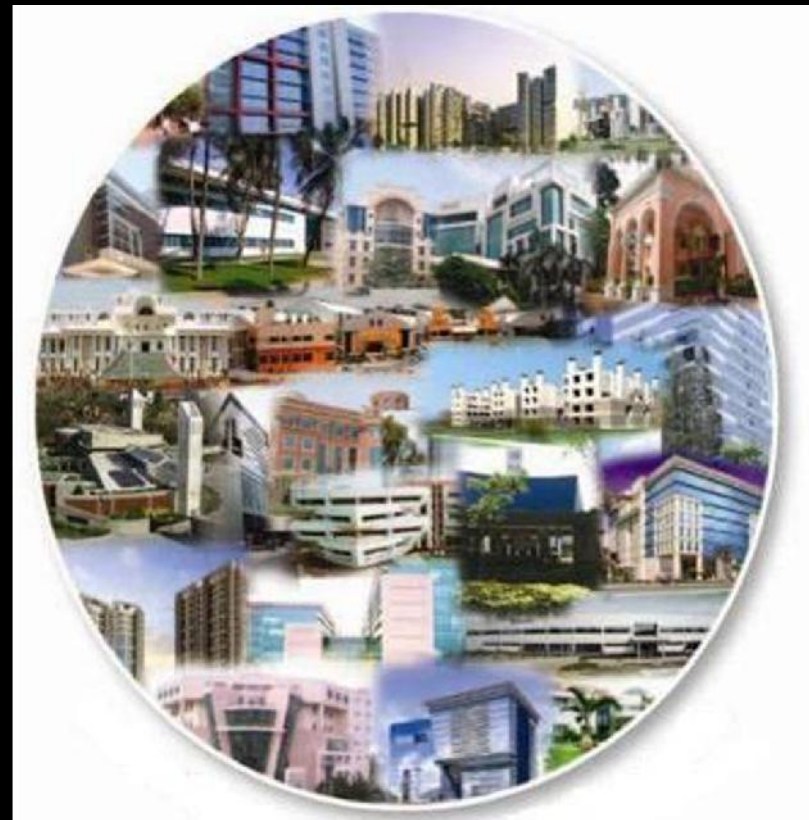
LEED-India Core & Shell Rating System

- Tenant Occupied Buildings

Growth of Green Buildings in India



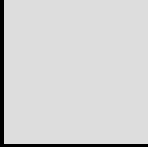
In 2001,
1 Green Building
20,000 Sq.ft.



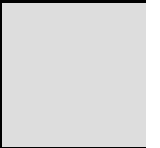
2016 Green Building Projects,
3+ Billion Sq.ft

Green Building Movement in India

IT PARKS, OFFICES, BANKS, AIRPORTS
CONVENTION CENTRE , EDUCATIONAL
INSTITUTIONS, HOTELS, RESIDENTIAL
COMPLEXES , HOSPITALS, FACTORIES
SCHOOLS, TEMPLES, UNIVERSITIES
INSTITUTES, GOVERNMENT BUILDINGS

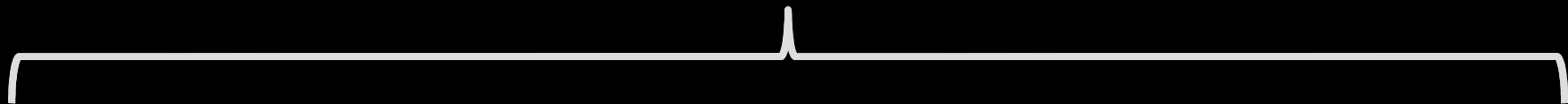


Green Building Rating Systems Available Today





- **IGBC Green New Buildings** : Owner Occupied & Leased Out
- **IGBC Green Homes** : Residential Buildings
- **IGBC Green Factories** : Industrial Buildings
- **IGBC Green Existing Buildings** : Existing Buildings
- **IGBC Green SEZ** : Special Economic Zones
- **IGBC Green Townships** : Townships and Large developments
- **IGBC Green Landscapes** : Landscapes, Amusement Parks, Heritage Bldgs
- **IGBC Green Mass Transit** : Metro, Railways etc.
- **IGBC Green Societies** : Residential Societies
- **IGBC Green Interior** : Building interiors
- **IGBC Green Cities** : Cities



Building Design
and Construction



Interior Design
and Construction



Building Operations
and Maintenance



Neighborhood
Development



Homes



Reference Guide

**GREEN BUILDING DESIGN &
CONSTRUCTION
2009 Edition**

**Green Interior Design &
Construction
2009 Edition**

**Green Building
Operations & Maintenance
2009 Edition**

LEED for Homes

LEED for Neighborhood Development

Rating System

LEED for New Construction

LEED for Core & Shell

LEED for Schools

LEED for Healthcare*

LEED for Retail*

LEED for Commercial Interiors

LEED for Retail Interiors*

LEED for Existing Buildings

LEED for Existing Schools*

LEED for Homes

LEED Neighborhood Development*



SVAGRIHA

- LESS than 2500 sq. mtr. built up area
- Any building, except for a factory building

GRIHA

- MORE than 2500 sq. mtr. Built-up area
- Any building, except for a factory building

GRIHA For Large Developments

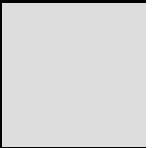
- MINIMUM built-up area 150000 sq. mtr. OR
- Minimum Site Area of 50 hectares

GRIHA PRAKRITI

- EXISTING School Buildings in India

While Green Building Rating Systems
provide **Guidelines**,

those **DO NOT LIMIT TO GO BEYOND**
for achieving higher levels of
Sustainability



FUTURE TRENDS

- Net Zero Energy Buildings
- Occupant Comfort
- Occupant Health
- Enhanced Microclimate
- Outdoor Comfort
- Building Commissioning
- Building Operation And Maintenance
- Building Integrated Modeling





Energy



Water



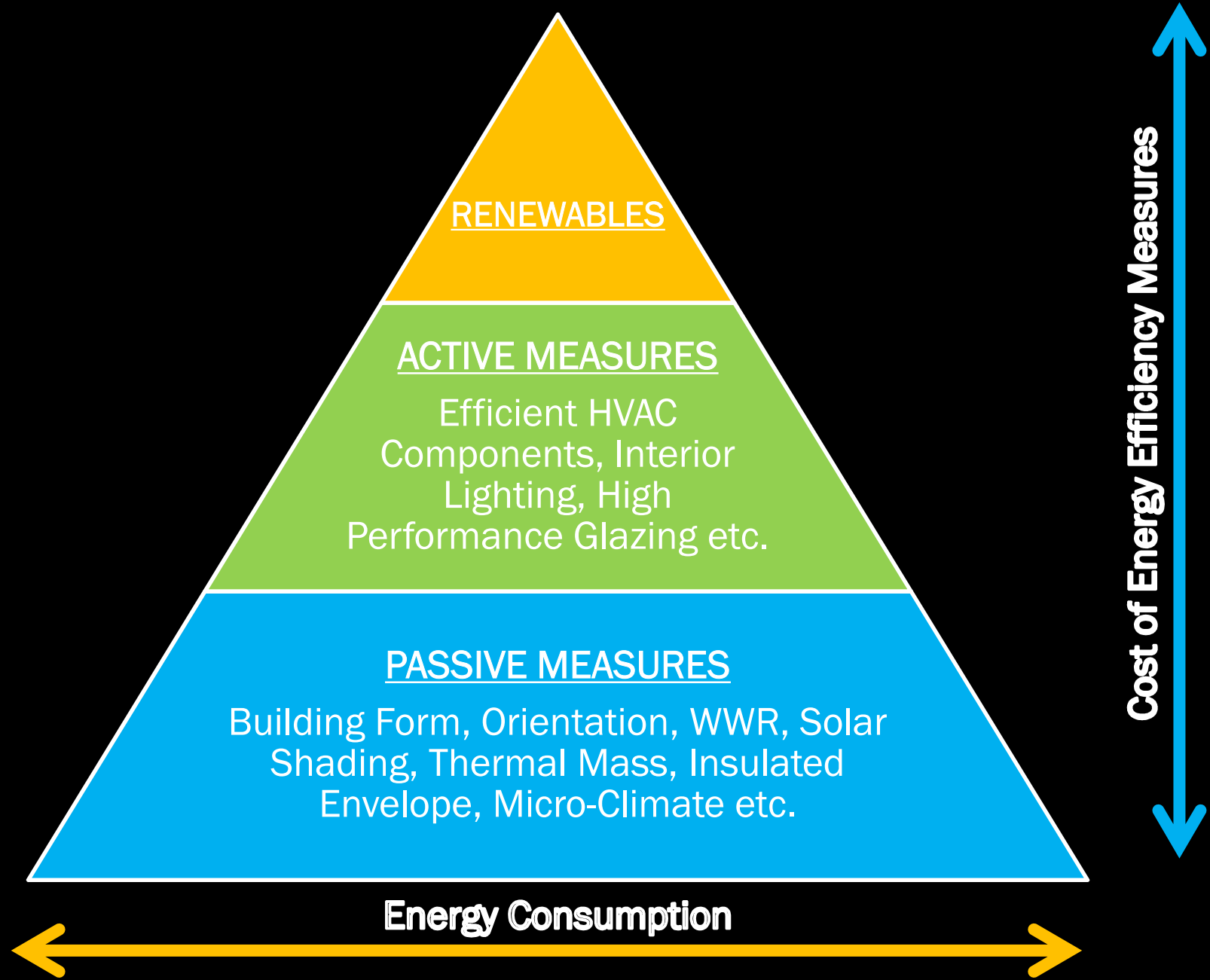
Embodied Energy

THE
WELL
BUILDING STANDARD®



Combining Nature (**Passive**) with Systems (**Active**)





For Smart & Sustainable Buildings

**INTEGRATED DESIGN
APPROACH....**

need of the hour

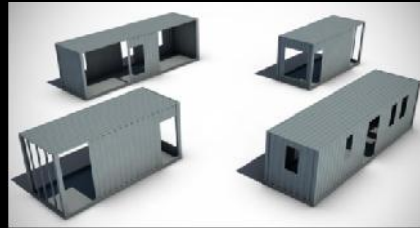
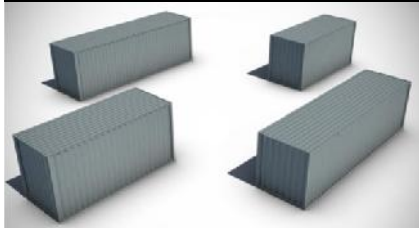


SHUNYA – NET ZERO ENERGY HOME

- India's **FIRST NET ZERO HOME**
- A house with **Minimal Carbon Footprint**
- **ZERO** Electricity Bills



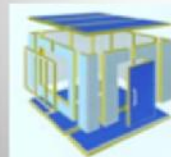
SHUNYA – NET ZERO ENERGY HOME



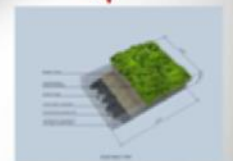
SOLAR PHOTOVOLTAIC PANELS



CENTRAL COURTYARD FOR OPTIMIZED NATURAL VENTILATION AND DAYLIGHT



HIGH PERFORMANCE INSULATED WALL AND ROOF PANELS



GREEN ROOFING



HIGH PERFORMANCE, AUTOMATED SOLAR FIN, UPVC FRAMED, DOUBLE GLAZED WINDOW PANELS

Solar Photovoltaic

3KW solar array on the roof to meet energy requirements of the home

Insulated Roof Panels

Cuts on heat gain to provided optimized indoor temperature

Double / Triple Glazed Windows Panels

For optimized daylight factor and cut down on heat gain

Green Wall

Promoting vertical gardening to offset horizontal green

Water Harvesting

Optimized water management including recycling of waste water and rain water harvesting

Insulated Roof

Helps reduce solar heat gain and provide more thermal comfort by reducing radiant temperature in natural ventilated space.

Solar Shading

Louvers at optimized angle filters in daylight with the glare inside the house

Wooden Deck

Made out of reclaimed wood cuts the demand for virgin wood thus saving forests

Fencing

Made out of reclaimed wood cuts the demand for virgin wood thus saving forests

Landscape Green

Horizontal coverage to reduce heat island effect around building

Floor Tiles

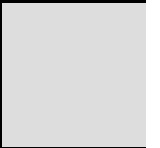
Made of recycled contents including glass in the range of 20 - 80%

Insulated Wall Panels

Cuts on heat gain to provide optimized indoor temperatures

NET ZERO ENERGY HOME

**Integration of
Passive & Active Strategies
in the building design
promises a
Green and Sustainable
Future...**



AEON

INTEGRATED BUILDING DESIGN CONSULTANTS LLP