Energy Conservation Through Green Buildings

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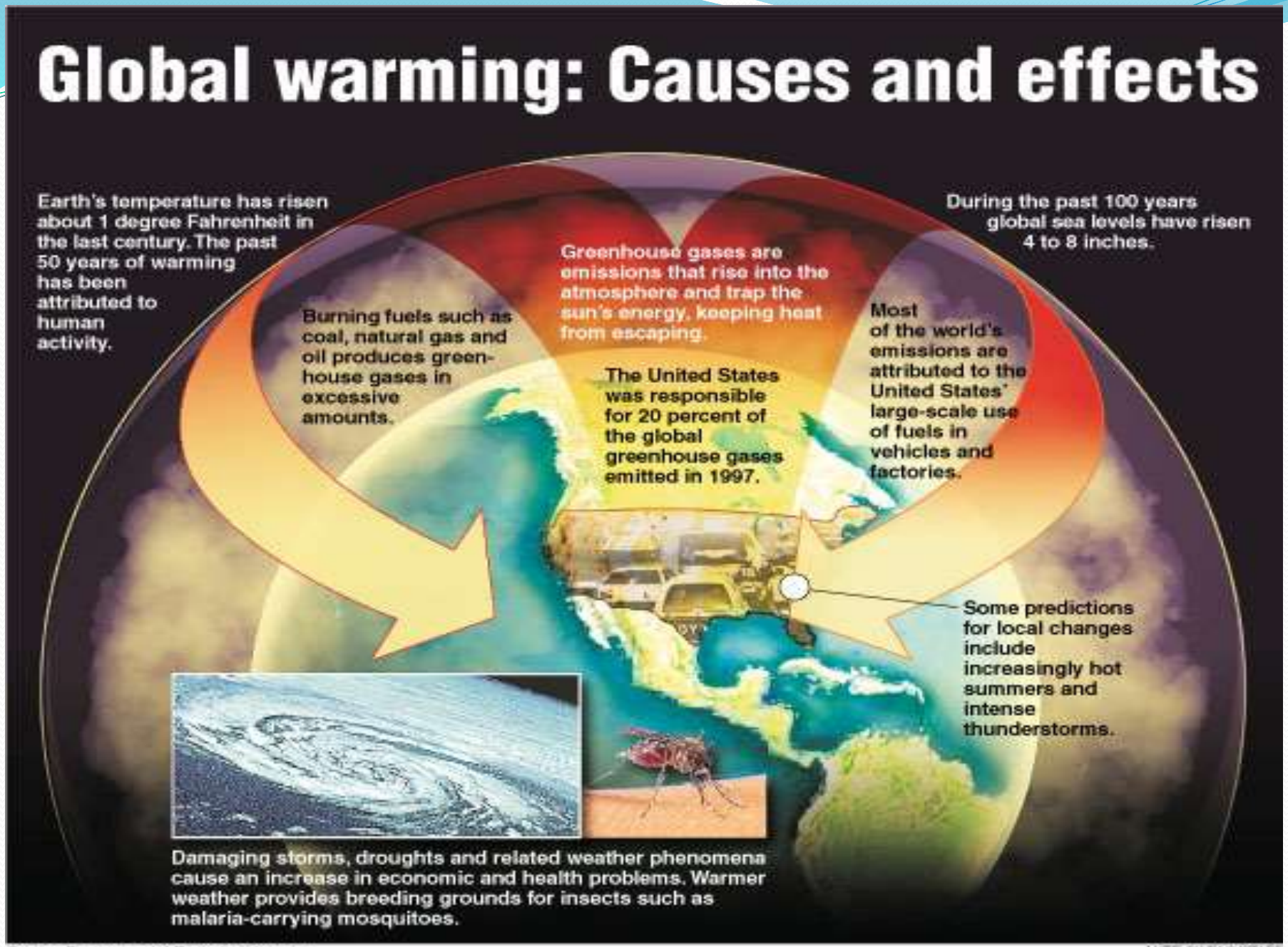
Global warming: Causes and effects



Source: Environmental Protection Agency

NATE OWENS/STAFF

Impacts Of Construction on environment

- ✓ Consume nearly 40% of raw materials.
- ✓ Consume 32% of total energy produced.
- ✓ Consume 17% of the fresh water.
- ✓ Consume 25% of global wood harvest.
- ✓ Responsible for Acid Rain.
- ✓ Generates
  - 25-40% of municipal solid waste.
  - 50% of world CFC production.
  - 30% of world CO_2 production.

What is Green building?

“ A building designed to conserve resources and reduce negative impacts on the environment – whether it is energy , water , building materials or land.

Advantages Of Green Buildings

Green buildings are designed for -

•Efficiently using energy.

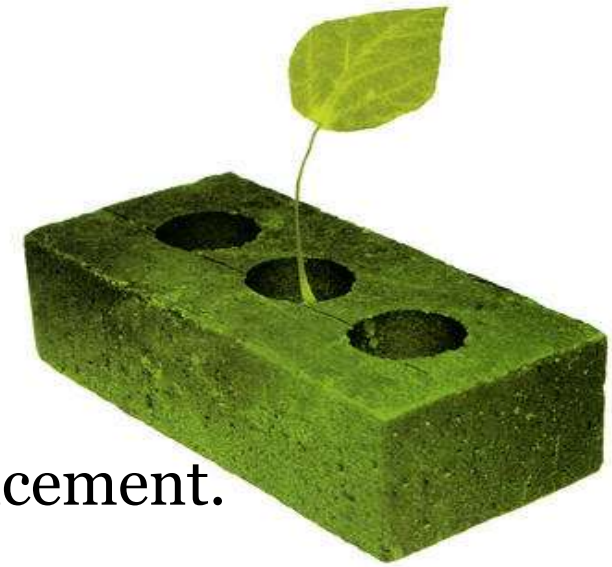
•Improving occupant health & productivity.

•Reducing waste, pollution etc.

Various Energy Saving Concepts

Fundamental Principles

The fundamental principles should be kept in mind while designing a green building :

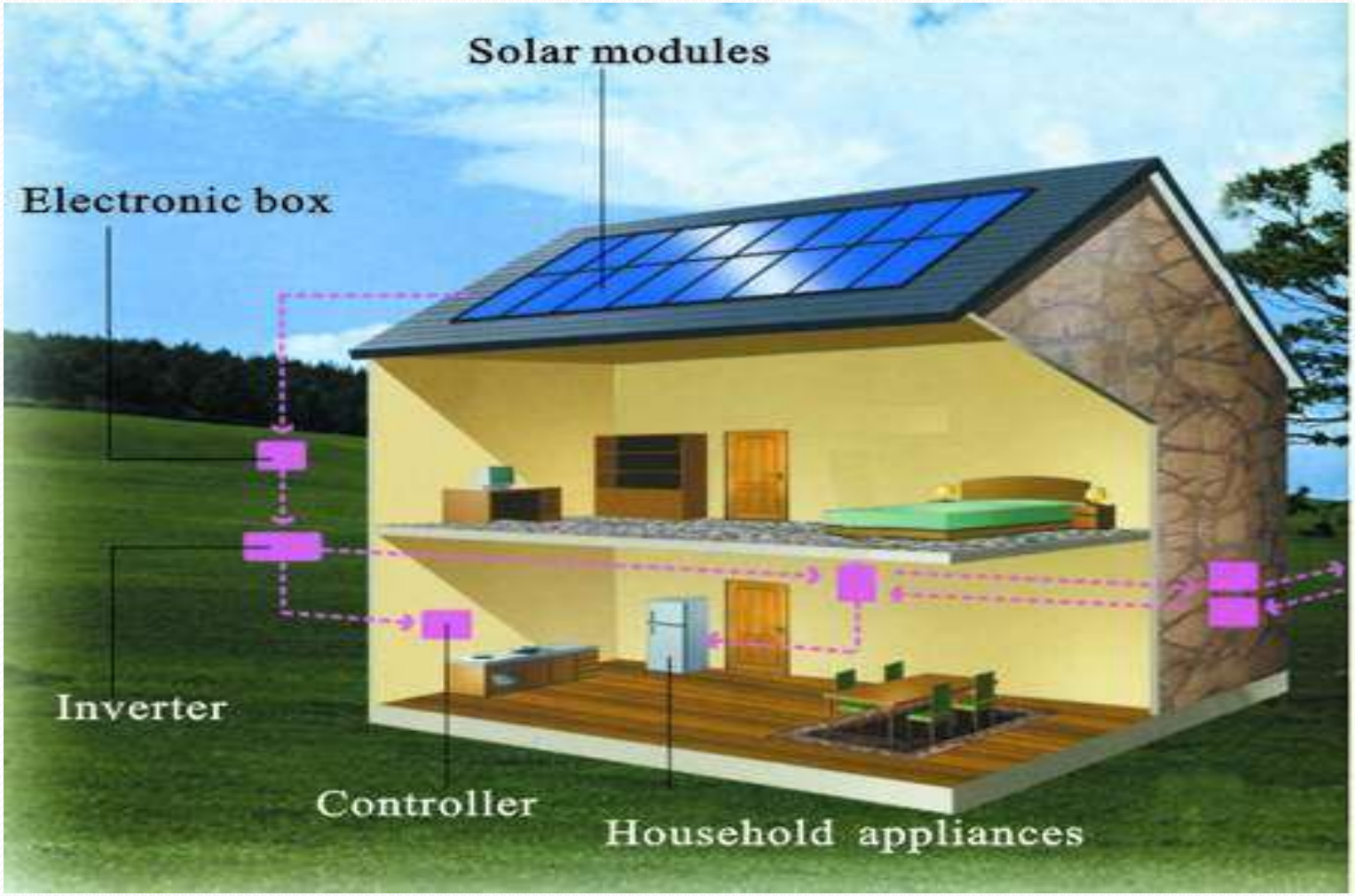


- Orientation.
- Energy efficiency.
- Waste and Toxics Reduction.
- Indoor environment quality enhancement.
- Materials and resource efficiency.

Orientation Of A Building

- Maximum daylight.
- Poly carbonated sheets.
- Glass frames with nanotechnology .

Solar Electricity Generation



Solar Energy Utilization

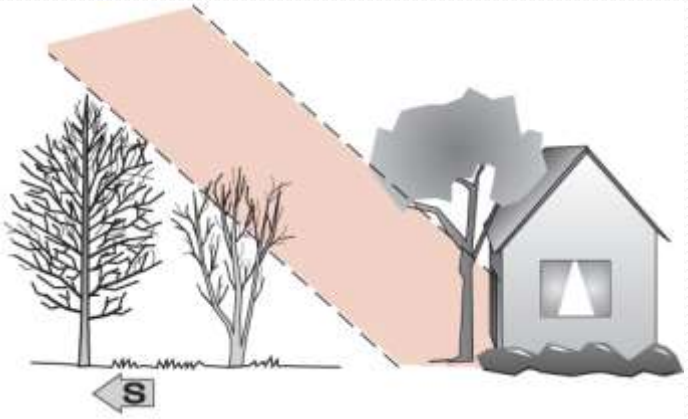
It can be used for –

- Lighting
- Cooling
- Heating
- Drying
- Cooking
- Sensors in washrooms
- Electronic Gadgets

Rain Gardens

- Planted Depression .
- Reduces Rain Run off.
- Prevents Soil Erosion .
- Prevents Pollution .

Role of Landscaping



Deciduous trees

Helps in maintaining temperature inside building by keeping greener in summers and falling leaves in winters hence allowing sun glare to enter the building in winters but not in summers.
e.g. Amaltas, champa etc.

Green Roofs

Green roof is a roof of a building that is partially or completely covered with vegetation.

Green roofs are used to:

- Grow flowers and fruits.
- Reduce heating and cooling.
- Reduce storm water run off.
- Filter pollutants.
- Sound Insulation.

Rain Water Harvesting System

The water is conserved by harvesting and storing the rainwater. The water harvested may be used in two ways:

1) Direct use
2) Ground water recharge.

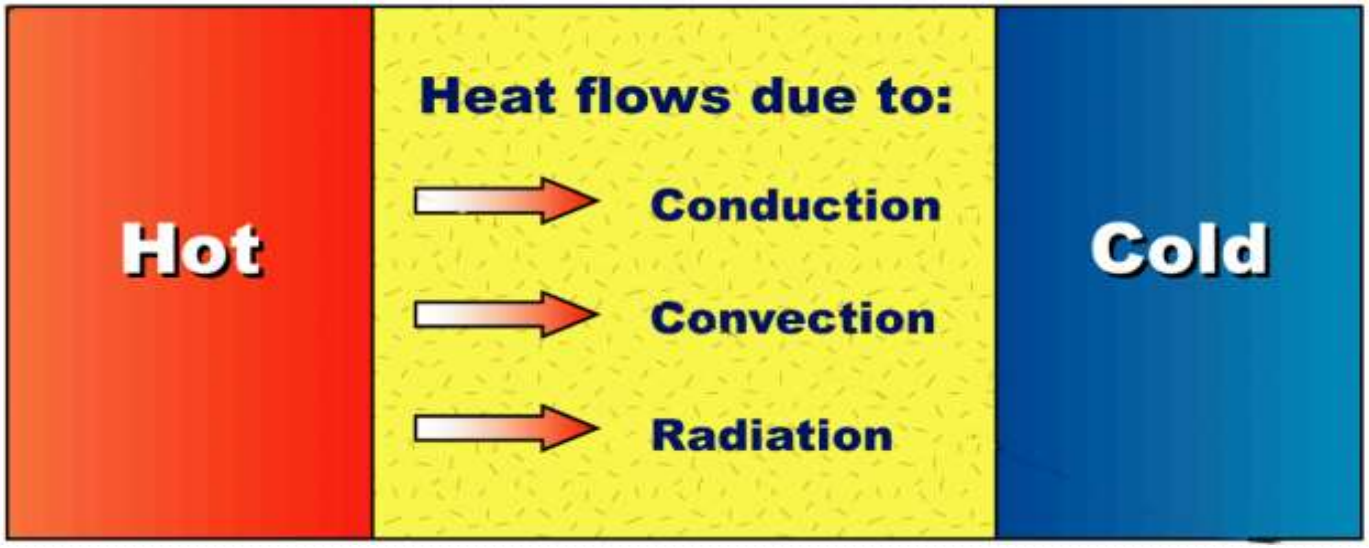
Direct use

Ground Water Recharge

Roof Top Or Pole Mounted Wind Turbine

- Cuts electricity bills…….
- Performance depends upon type of the turbine and location.

Insulation Of Exterior Walls



- Prevents heat transfer.
- Reduces movement of sound waves and dust.
- The house is quieter and cleaner.

Solid Waste Reduction

4-R Principle Should be Adopted for reducing solid waste –

- ✓ *Reduce*
- ✓ *Recycle*
- ✓ *Reuse*
- ✓ *Recover*

Low VOC Paints

It helps to -

- Lower ozone pollution.
- Fewer smog-forming emissions.
- Reduced incidents of eye and respiratory irritation.
- Better air quality.

Benefits Of Green Buildings

- Enhance and protect biodiversity and ecosystems.
- Improve air and water quality.
- Reduce waste streams.
- Conserve and restore natural resources .
- Reduce operating costs

Green Building Materials

Green building materials should meet the following criteria:

- Natural, plentiful or renewable
- Resource efficient manufacturing process
- Locally available
- Reusable or recyclable.
- Durable
- Low-VOC assembly
- Moisture resistant
- Healthfully maintained

Different Agencies involved in certifying green buildings :

- **USGBC –** United States Green Building Council.
- **GBCI –** Green Building Certification Institute.
- **TERI –** The Energy Resource Institute.
- **LEED –** Leadership in Energy & Environmental Design.

Environmentally sustainable construction

The rating system addresses these major areas :

- **Sustainable sites**
- **Water efficiency**
- **Energy and atmosphere**
- **Materials and resources**
- **Indoor environmental quality**

Lewis and Clark State Office Building
Jefferson City, Missouri

Some Certified Green Buildings of India:

NEG Micon Building, Chennai
(Gold Rating)

Suzlon One Earth, Pune
(LEED – Platinum Rating)

L & T EDRC I, Chennai
(Silver Rating)

Wipro Technologies, Gurgaon
(Platinum rating)

Ist LEED CERTIFIED BUILDING OF INDIA
GODREJ

START THINKING GREEN

"Follow GREEN shastra before VASTU shastra"

Any Questions ???

Thank You!