ENERGY EFFICIENT BUILDINGS

MADE & PRESENTED BY
-SIDHANT JINDAL

WHAT IS ENERGY EFFICIENT BUILDING?

Energy efficient buildings can be defined as buildings that are designed to provide a significant reduction of the energy need for heating and cooling, independently of the energy and of the equipments that will be chosen to heat or cool the building.

NEED OF ENERGY EFFICIENT BUILDINGS

- Globally the building sector accounts for more electricity use than any other sector: 42%;.
- We spend more than 90% of our time in buildings
- Energy-efficient buildings reduce indoor air pollution because they offer cleaner combustion and better ventilation than traditional buildings.
- Efficient buildings—those that make highly productive use of natural resources—are vital to achieving sustainable development.

WHY IS EE IN BUILDINGS IMPORTANT FOR GOVERNMENTS?

- Capital costs of efficiency are lower than comparable investments in increased supply
- No additional operating costs of efficiency measures compared to substantial operating costs for supply-side options
- Energy efficiency investments have shorter lead times than energy supply investments

By setting energy efficiency targets for buildings, governments share the burden and cost of ensuring the security of energy supply

BENEFITS OF ENERGY EFFICIENT BUILDINGS

Energy efficiency is about much more than saving electricity. Indeed, energy efficient homes and buildings come with many benefits.

- Living in an energy efficient building can lower your heating bills by more than 50%.
- Energy efficient buildings stay more comfortable and safe during a blackout or disaster.
- 13 jobs are created for every $1 million invested in energy efficiency.
- Energy efficiency has direct and indirect benefits to health.

CERTIFYING ENERGY EFFICIENCY

An Energy Efficiency Certificate is a summary of a building's energy audit. It is meant to give information on the building's energy consumption and its energy efficiency rating

- .The purpose of Energy Efficiency Certificates is to
  - Inform tenants and prospective buyers on the expected running costs
  - Create public awareness
  - Acts as a prerequisite of measures to improve its energy efficiency: -
  - To effect incentives, penalties or legal proceedings

CONTINUED……

- Buildings are given two ratings based on the intrinsic and actual energy performance:-
  - Asset Rating: A rating of the standard of the building fabric and building services equipment and is based on theoretical values.-
  - Operational Rating. This will be influenced by the quality of the building (as measured by the Asset Rating), but also by the way the building is maintained and operated. It is based on the normalized actual metered energy consumption.

EE MEASURES FOR BUILDINGS

- Approaches through which the energy consumption of a building can reduced. They can be categorized into:-
  1. Reducing heating demand
  2. Reducing cooling demand
  3. Reducing the energy requirements for ventilation
  4. Reducing energy use for lighting
  5. Reducing energy used for heating water
  6. Reducing electricity consumption of office equipment and Appliances, Good housekeeping and people solutions

POLICIES OF GOVT FOR EE

- The Central Government may issue the energy savings certificate to the designated consumer whose energy consumption is less than the prescribed norms and standards in accordance with the procedure as may be prescribed
- The designated consumer whose energy consumption is more than the prescribed norms and standards shall be entitled to purchase the energy savings certificate to comply with the prescribed norms and standards
- The Central Government may, in consultation with the Bureau, prescribe the value of per metric ton of oil equivalent of energy consumed
- Commercial buildings which are having a connected load of 100 kW or contract demand of 120 kVA and above come under the purview of ECBC under EC Act.

SCHEMES TO PROMOTE ENERGY CONSERVATION AND ENERGY EFFICIENCY

- The Bureau initiated the Standards and Labeling programme for equipment and appliances in 2006 to provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the relevant marketed product.
- The Energy Conservation Building Code (ECBC) was developed by Govt. of India for new commercial buildings on 27th May 2007. ECBC sets minimum energy standards for new commercial buildings having a connected load of 100kW or contract demand of 120 KVA and above. While the Central Government has powers under the EC Act 2001, the state governments have the flexibility to modify the code to suit local or regional needs and notify them.

THINGS THAT WE SHOULD KEEP IN MIND WHILE MAKING ENERGY EFFICIENT HOUSE

- Start with Smart Design
- Use the Sun for Solar Tempering
- Optimize with Energy Modeling
- Super-Insulate the Building Envelope
- Use Highly Insulated Windows and Doors
- Create an Energy Efficient, Fresh Air Supply
- Select an Energy Efficient Heating and Cooling System
- Install Energy Efficient Lighting
- Select Energy Efficient Appliances and Electronics
- Use the Sun for Renewable Energy

HOW TO MAKE EXISTING HOMES ENERGY EFFICIENT

- Seal All Windows
- Turn Off Unnecessary Water
- Replace Incandescent Bulbs
- Unplug Unused Chargers
- Install Solar Panels
- Buy Energy Star Products
- Replace Your Desktop Computer

IMPORTANT FEATURES

Energy efficiency is not just for older homes. Even if your home is relatively new, you could be saving valuable energy and money with some simple steps. Improving your home's efficiency with features such as insulation, water heaters, high efficiency heating and cooling equipment and even pool pumps, will help you:

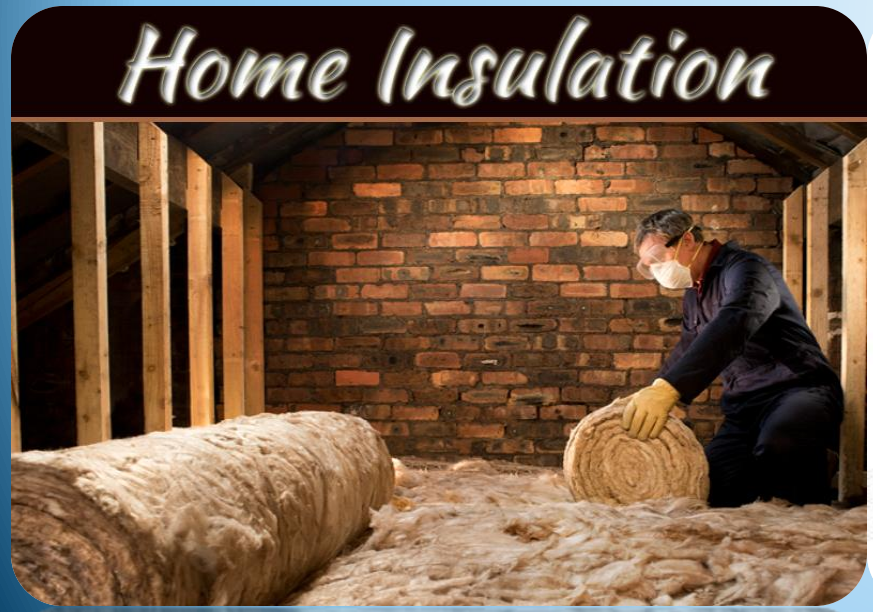
- **Save money** on energy bills and may qualify for certain rebates.
- **Increase the comfort level** in your home with better air distribution and less noise.
- Create a **healthier living environment** as it prevents pollutants.
- **Contribute to a cleaner environment** by using less energy and increased efficiency of energy production.

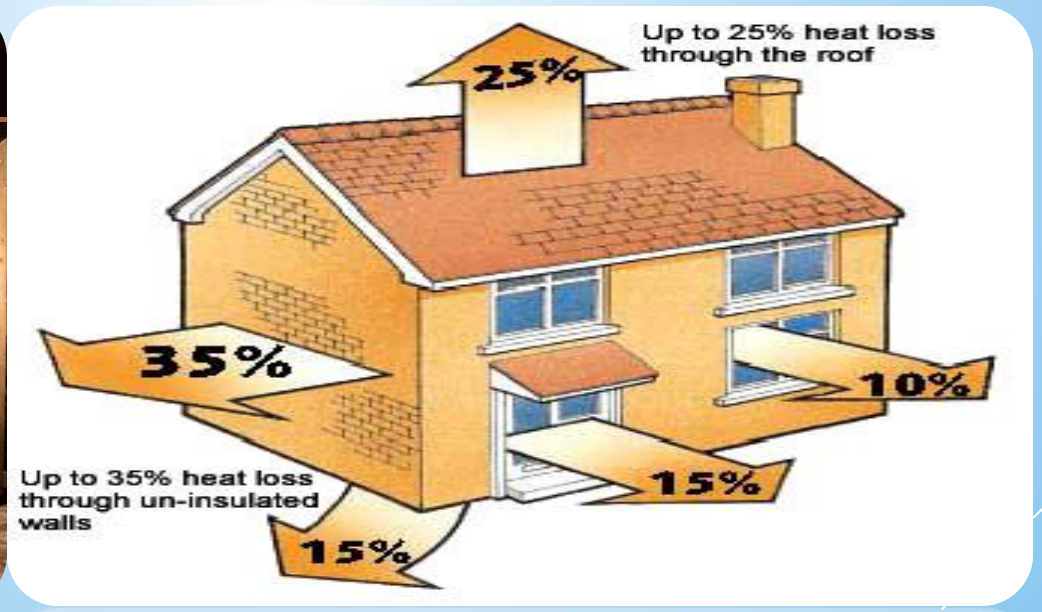
SOME KEY FEATURES OF EE BUILDINGS

- Home insulation
- Window replacement
- Solar thermal
- Air sealing
- Solar electric panels
- Energy efficient lighting
- Energy star appliances

HOME INSULATION

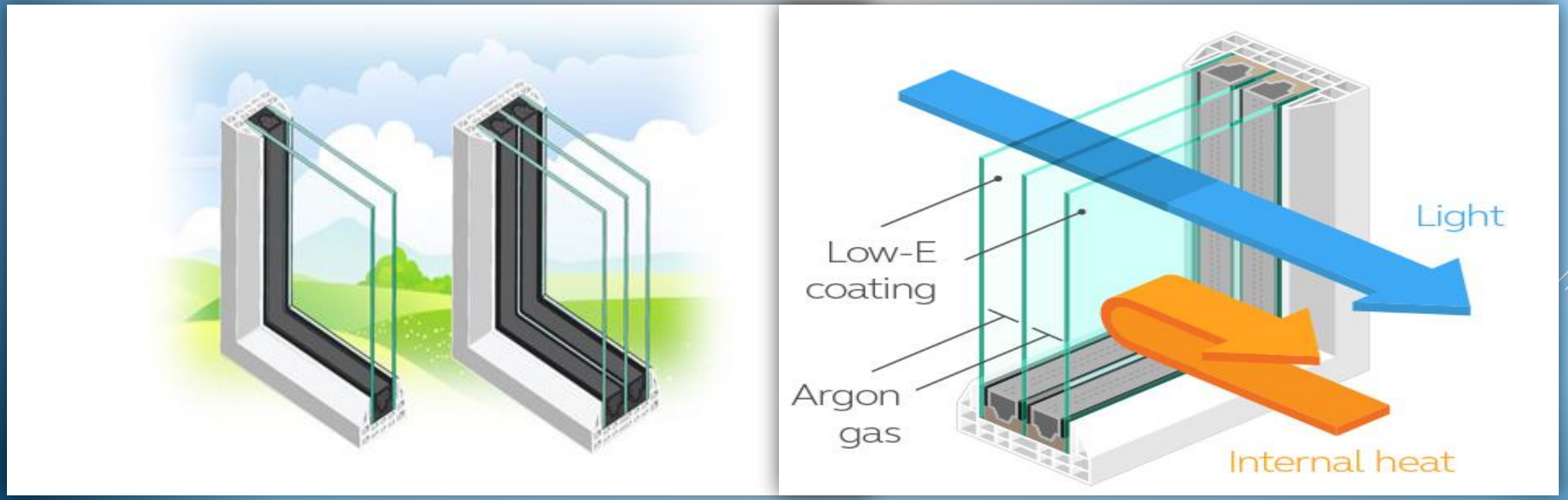
- In Home insulation, insulation is material used that reduces heat loss or heat gain by providing a barrier between the inside of your home and the significantly different temperature outside and it will reduce your heating and cooling energy costs.





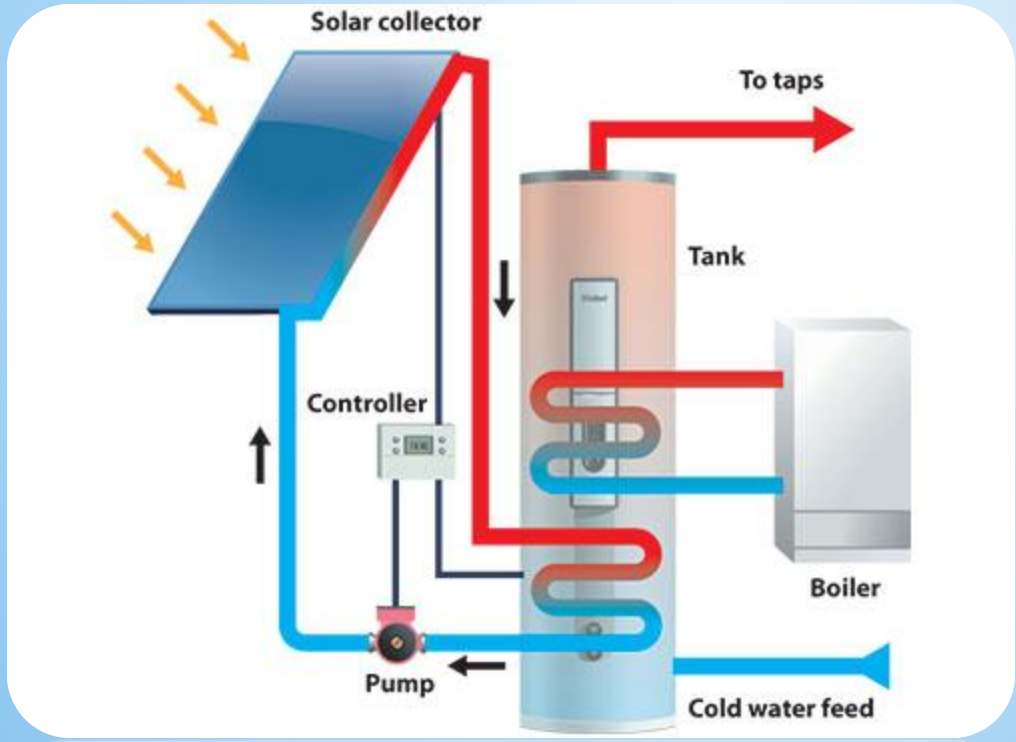
WINDOW REPLACEMENT

- **Window replacement.** Double pane or triple pane low emissivity (low-e) windows can also reduce outside noise, drafts and heating and cooling costs



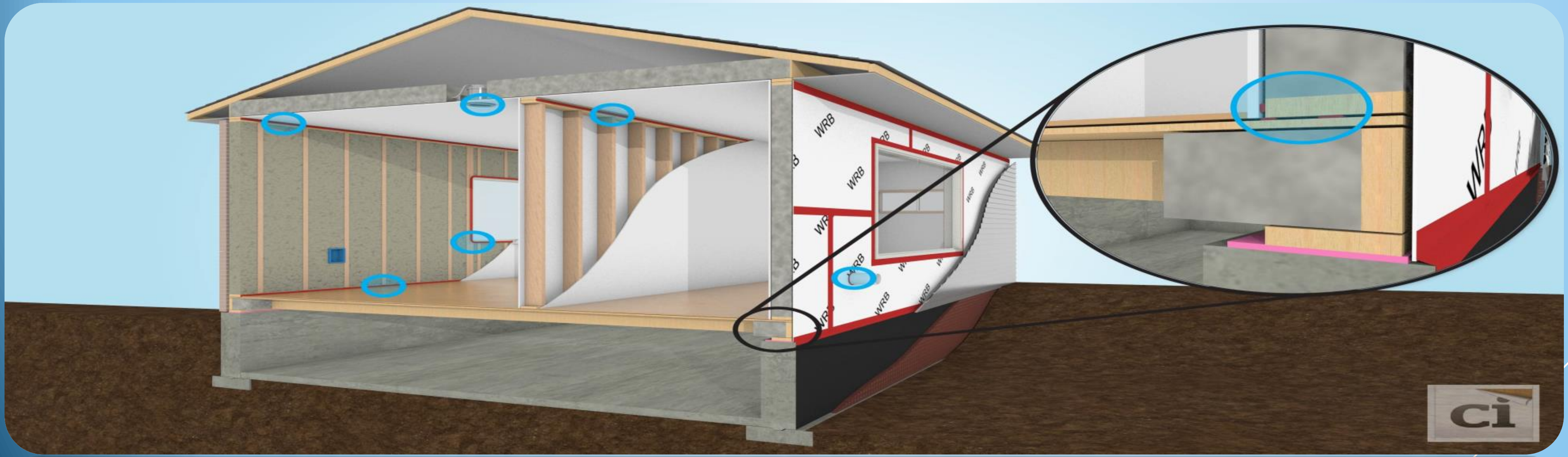
SOLAR THERMNAL

- **Solar thermal.** These systems harness the power of the sun to both heat water and the home.



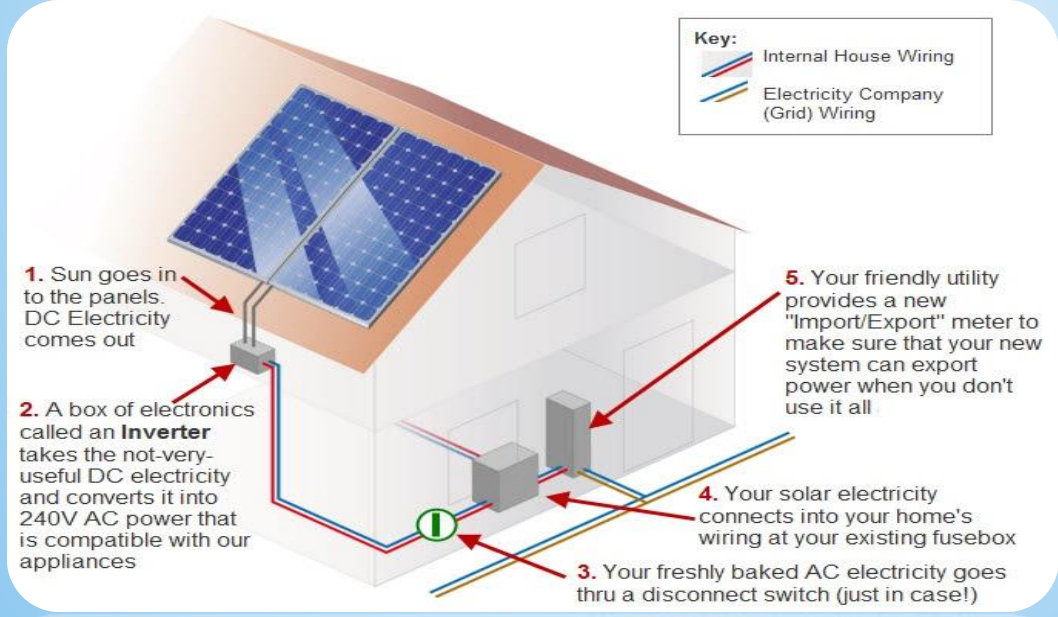
AIR SEALING

- **Air sealing.** Reduces drafts, saves energy costs, and keeps must, mold and allergens out.



SOLAR ELECTRIC PANELS

- **Solar electric panels.** Converting sunlight into electricity reduces the collective dependence on fossil fuel. Solar can immediately lower your energy costs and protect from rising electricity rates.



ENERGY EFFICIENT LIGHTING

- **Energy efficient lighting.** Replacing incandescent bulbs with more energy efficient CFLs and LED lighting can reduce energy use in homes by 50-75%.

ENERGY STAR APPLIANCES

ENERGY STAR certified appliances help consumers save money on operating costs by reducing energy use without sacrificing performance.

THANK YOU