

RENEWABLE RESOURCES

- Solar energy
- Wind energy
- Hydro power
- Geo Thermal energy



SOLAR ENERGY

- **Solar energy** is radiant light and heat from the sun harnessed using a range of ever-evolving technologies such as solar photovoltaic cells.
- The Sun is a powerful source of energy that provides the Earth with as much energy every hour as we collectively use in a year worldwide.
- **Energy from the sun is harnessed in two ways:**
 1. Active solar involves capturing and redistributing sunlight through the use of solar panels, pumps or solar fans to generate power usually on a large scale.
 2. Passive solar works to reduce the amount of energy traditionally used to power a location, such as a building or house. An example is building a house in the natural direction of sunlight to trap heat.

WIND ENERGY

- The Electrical energy that is obtained from harnessing the wind with wind mills or wind turbines is called **Wind Energy**.
- Winds are caused by the uneven heating of the atmosphere by the sun, the irregularities of the earth's surface, and rotation of the earth.
- Wind turbines convert the kinetic energy in the wind into mechanical power.
- Large wind farms consist of hundreds of individual wind turbines which are connected to the electric power transmission network.

HYDRO POWER

- **Hydro power** is the energy derived from the falling water or running water.
- Falling water is channeled through water turbines.
- The pressure of the flowing water on turbine blades rotates a shaft and drives an electrical generator, converting the motion into electrical energy.
- But hydroelectric power doesn't necessarily require a large dam. Some hydroelectric power plants just use a small canal to channel the river water through a turbine.

GEO-THERMAL ENERGY

- **Geothermal energy** is thermal energy generated and stored in the Earth.
- Thermal energy is the energy that determines the temperature of matter.
- The geothermal energy of the Earth's crust originates from the original formation of the planet (20%) and from radioactive decay of minerals (80%).
- The geothermal gradient, which is the difference in temperature between the core of the planet and its surface, drives a continuous conduction of thermal energy in the form of heat from the core to the surface.
- Resources of **geothermal energy** range from the shallow ground to hot water and hot rock found a few miles beneath the Earth's surface, and down even deeper to the extremely high temperatures of molten rock called magma.