NATURAL RESOURCES

RENEWABLE & NON-RENEWABLE

WHAT ARE NATURAL RESOURCES?

Resources that occur in our nature are known as Natural Resources.

These can not be produced by our man-kind.

Examples:

1. Sun light
2. Minerals

CLASSIFICATION OF NATURAL RESOURCES

Natural Resources can be classified into ***TWO*** categories:

1. Renewable resources
2. Non-Renewable resources

WHAT ARE RENEWABLE RESOURCES?

- Resources that can be replenished naturally in the course of time are called Renewable Resources.

- **Examples:**

i. Air
ii. Water
iii. Sunlight
iv. Wind

WHAT ARE NON-RENEWABLE RESOURCES?

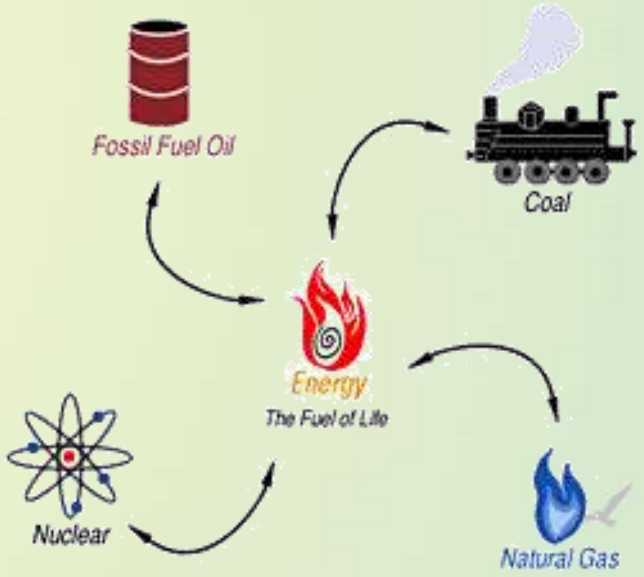
- Resources that exist in limited supply and cannot be replaced if they are used up are called Non-Renewable Resources.

- Examples:

i. Oil
ii. Natural gas
iii. Coal
iv. Nuclear fuels

Renewable Energy

Non-Renewable Energy



RENEWABLE RESOURCES

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

SOLAR 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

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

- **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

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.

PROS & CONS
OF
RENEWABLE RESOURCES

SOLAR ENERGY

- **Pros:**

Save Money: A lot of money can be saved as the money paid in the form of Power bill will be reduced.

Green energy: Pollution produced by the burning of fossil fuels like petrol, cutting trees for timber can be decreased to a great extent.

- **Cons (mostly mythical):**

Upfront cost: Some people hold off on purchasing solar panels because they imagine that they can't afford the initial expense. But, the amount spent on installing Solar panels can be gained in a few years, as they save on Electricity produced from traditional sources such as coal, wood etc.

Maintenance: Homeowners unfamiliar with solar technology sometimes fear that complex repairs will be needed. In fact, solar panels have no moving parts, so there's no wear and tear. Rain is generally sufficient to keep the panels free from dust and grime.

WIND ENERGY

- **Pros:**

- Wind energy is a green energy source and does not cause pollution.
- The potential of wind power is enormous – 20 times more than what the entire human population needs.
- The operational costs associated with wind power are low.

- **Cons:**

- Wind is a fluctuating (intermittent) source of energy and is not suited to meet the base load energy demand unless some form of energy storage is utilized (e.g. batteries, pumped hydro).
- The manufacturing and installation of wind turbines requires heavy upfront investments – both in commercial and residential applications.
- Wind turbines can be a threat to wildlife (e.g. birds, bats).

HYDRO POWER

- **Pros:**

- Hydroelectricity is very reliable energy. There are very little fluctuations in terms of the electric power that is being by the plants, unless a different output is desired
- Adjusting water flow and output of electricity is easy. At times where power consumption is low, water flow is reduced and the magazine levels are being conserved for times when the power consumption is high.

- **Cons:**

- Hydroelectric power plants may affect fish is a complex interaction between numerous physical and biological factors.
- Building power plants in general is expensive.
- Electricity generation and energy prices are directly related to how much water is available. A drought could potentially affect this.

GEO-THERMAL ENERGY

- **Pros:**

- No fuel required (no mining or transportation)
- Not subject to the same fluctuations as solar or wind.
- Smallest land footprint of any major power source.
- Virtually limitless supply.

- **Cons:**

- Prime sites are often far from population centers
- Losses due to long distance transmission of electricity
- Sulfur dioxide and silica are emitted.

NON-RENEWABLE RESOURCES

NON-RENEWABLE RESOURCES

1. Oil
2. Natural gas
3. Coal
4. Nuclear resources

OIL

OIL

- Liquid petroleum -crude **oil**- is the only nonrenewable resource in fluid form.
- A fossil fuel that is being used up faster than new reserves are discovered, the oil supply may only last through the middle of this century.
- Industrial nations, with the U.S. far in the lead, are the biggest consumers of crude oil.
- Gasoline, heating oil, and diesel fuel are the primary uses of the resource, although manufacturers utilize oil as the base for such products as plastics and industrial chemicals.

NATURAL GAS

NATURAL GAS

- **Natural gas** is a fossil fuel formed when layers of buried plants, gases, and animals are exposed to intense heat and pressure over thousands of years.
- The energy that the plants originally obtained from the sun is stored in the form of chemical bonds in natural gas.
- It is primarily composed of methane, but contains ethane, propane and butane as well.
- Once drillers extract natural gas, processing plants remove the propane and butane for use as liquefied petroleum gas (LPG), a household and industrial fuel.
- According to the current usage statistics and the volume of world reserves, the supply of natural gas should last another century.

COAL

COAL

- **Coal,** which is a primary resource of energy in India, is the product of millions of years of pressure on original organic matter from plants buried underground.
- It is a combustible black or brownish-black sedimentary rock usually occurring in rock strata in layers or veins called **coal beds** or **coal seams.**
- Anthracite, the purest form of coal, contains about 94 - 95% of carbon.
- At the power plant, coal is commonly burned in a boiler to produce steam. The steam is run through a turbine to generate electricity.
- The global supply of coal, given the current rate at which it is used, should last at least two more centuries.

NUCLEAR ENERGY

NUCLEAR ENERGY

- Nuclear power, or nuclear energy, is the use of exothermic nuclear processes, to generate useful heat and electricity.
- The term includes nuclear fission, nuclear decay and nuclear fusion.
- Presently the nuclear fission of elements in the actinide series of the periodic table produce the vast majority of nuclear energy in the direct service of humankind.
- In nuclear fission, neutrons smash into the nucleus of Uranium atoms and release energy in the form of heat. Water is converted to steam by this heat and it is used to drive the turbines.
- Nuclear (fission) power stations, excluding the contribution from naval nuclear fission reactors, provided about 5.7% of the world's energy and 13% of the world's electricity in 2012.

Steps to be taken for conservation of natural resources

- Use various resources only when needed.
- Avoid the wastage of resources.
- Avoid the use of material from wild life sources.
- Use energy efficient electrical appliances.
- Use pressure cooker for cooking which saves 75% of the LPG used in homes.
- Old vehicles should not be used as they are less fuel-efficient and also cause pollution.
- Utilize renewable energy sources as much as possible. Encourage use of solar cooker, pump etc
- We should recycle the waste and waste water for agriculture purposes.

Thank You..