MAHESH PUBLIC SCHOOL, JODHPUR

REVISION NOTES - 2

CLASS X **Subject : SCIENCE**

Chapter : Sources of Energy

- Conditions of the good fuel
  (i) High calorific value
  (ii) Less smoke
  (iii) Less residue left after burning
  (iv) Easy available
  (v) Inexpensive
  (vi) Easy to store and transport

A Good source of energy should be :

- Safe and convenient to use, For example; energy nuclear can be used only by highly trained engineers with the help of nuclear power plants. It cannot be used for our household purpose.
- Easy to transport, For example; coal, petrol, diesel, LPG etc. have to be transported from the places of their production to the consumers.
- Easy to store, For example; huge storage tanks are required to store petrol, diesel, LPG etc.

Classification of Sources of energy
The sources of energy can be classified as follows :

1. Renewable sources of energy.
2. Non-Renewable sources of energy.

1. Renewable sources of energy: Renewable sources of energy are those which are inexhaustible, i.e., which can be replaced as we use them and can be used to produce energy again and again.
These are available in an unlimited amount in nature and develop within a relatively short period of time.
Example of Renewable Sources of Energy :

- Solar energy.

- Wind energy.
- Water energy (hydro-energy).
- Geothermal energy.
- Ocean energy.
- Biomass energy (firewood, animal dung and biodegradable waste from cities and crop residues constitute biomass).

Advantages of Renewable Sources of Energy

- These sources will last as long as the Earth receives light from the sun.
- These sources are freely available in nature.
- These sources do not cause any pollution.

2. Non-Renewable Source of Energy: Non-renewable sources of energy are those which are exhaustible and cannot be replaced once they have been used. These sources have been accumulated in nature over a very long period of millions of years.
Examples of Non-renewable Sources of Energy :

- Coal.
- Oil.
- Natural gas.
  All these fuels are called fossil fuels.

Disadvantages of Non-renewable Sources of Energy

- Due to their extensive use, these sources are fast depleting.
- It is difficult to discover and exploit new deposits of these sources.
- These sources are a major cause of environmental pollution.

• Conventional sources of energy
  • FOSSIL FUELS: Millions of years ago plants and animals tissues got buried under the ground and were subjected to high temperature and pressure. Coal is a fossil fuel which was formed due to subjection of plant tissues under high pressure and temperature. While petroleum is obtained from the remains of animals between sedimentary rocks.
  These are non-renewable sources of energy and lead to pollution on combustion.
  • THERMAL POWER PLANT: -Thermal power plant use coal, petroleum and natural gas to produce thermal electricity.

-The steam produced is used to run the turbine to generate electricity.
- Electricity transmission is more efficient.

Disadvantages

- Fossil fuels are used which is non- renewable source of energy.
- Leads to water and air pollution.

- HYDRO POWER PLANTS

It is themost conventional renewable source obtained from water falling on from the height

- It Is clean non- polluting source of energy
- Dams are constructed near rivers. As the water level rises, the kinetic energy of water gets changed to potential energy
- The water is released to rotate the turbine and electricity is generated.

Disadvantages

- Highly expensive
- Dams can be made at limited areas
- Large areas of human habitation and agricultural fields are submerged
- Problem of rehabilitation of displaced people

- NON CONVENTIONAL SOURCES OF ENERGY
- WIND ENERGY: - It can be converted to mechanical and electrical energy
- Kinetic energy of wind is used in lifting water from pump, grinding grains etc.

ADVANTAGES

- Eco friendly
- Renewable

DISADVANTAGES

- Wind speed is not uniform
- Need large areas for wind mills
- Need lot of investment
- Output is less
- SOLAR ENERGY: - Solar radiations can be converted to other forms of energy through photovoltaic cells.

- These cells convert solar radiations directly into electricity through silicones solar cells.

- Solar cookers are painted black from outside and a have glass plate to trap solar radiations by greenhouse effect.

ADVANTAGES

- Eco friendly
- Renewable
- Used in rural areas

DISADVANTAGES

- Silicon cells are expensive
- Solar radiation are not uniform over earth's surface
- Can't be used at night or on cloudy day.
- Maximum temperature achieved by solar cooker is 100° C
- GEOTHERMAL ENERGY

Utilization of heat in the interior of earth for power generation is called geothermal energy. In places where hot springs or geysers occur steam trapped in rocks is brought in turbine through pipes to generate electricity.

ADVANTAGES

- Renewable
- Inexpensive

DISADVANTAGES

- Only available in few sites
- NUCLEAR ENERGY

Radioactive elements generate large amount of energy e.g. 1 ton of U-235 provide as much as energy as 3 million ton of coal.

It is sued for heat generation and as fuel for marine vessels.

ADVANTAGES

- Alternative source due to depletion of fossil fuels
- From small amount of fuel large amount of energy is obtained

DISADVANTAGES

- Risk of nuclear wastage
- High cost
- Pollution

ENERGY FROM THE SEA

- Tidal energy: depends upon the harnessing of rise and fall of the sea level due to tidal energy. Dams are constructed across a narrow part of sea and turbine converts tidal energy to electricity
- Ocean thermal energy: the difference in temperature of water at surface and the water at the depths is exploited. The warm surface water is used to boil ammonia and turbine is run by the vapours of ammonia.

WAVE ENERGY

- Waves of sea are used as their kinetic energy is converted into electrical energy
- Turbine is used to produce electricity