

CLASS 10 -PHYSICS

SOURCES OF ENERGY

- A source of energy is that which is capable of providing enough useful energy at a steady rate over a long period of time.
- A good source of energy should be-
 - (a) Safe and convenient to use.
 - (b) Easy to transport.
 - (c) Easy to store.

Characteristics of a good fuel-

- (a) Less smoke.
- (b) Less residue after burning easy availability.
- (c) High calorific value.
- (d) Inexpensive.
- (e) Easy to store and transport.

Classification of sources of energy:-

Renewable sources of energy:- 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 ultimate amount in nature and develop within a relatively short period of time.
Example:- solar energy, wind energy, hydro energy, geothermal energy, ocean energy etc.

Advantages:-

- 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.

Non-Renewable sources of energy:- 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.

Example:-coal, oil, natural gas etc.

Disadvantages:-

- 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.

Fossil fuels:- Fossil fuels are the remains of prehistoric plants and animals which get buried deep inside the earth millions of years ago due to some natural processes.

- These fossil fuels are non-renewable sources of energy and cause problems due to pollution.

FORMATION OF FOSSIL FUELS:-

During its formation an entire organism or its parts often get buried in sand or mud. These then decay and disintegrate leaving no signs of their existence. In fact the harder part of organisms after their death settle down and are covered by sediments and subjected to extreme pressure and temperature or the earth converts them into fossil fuels, this process is known as fossilization.

Sources of energy are also classified as:-

(A) Conventional sources of energy:- Which are used extensively and meet a market portion of our energy requirement and these are:-

- ❖ **FOSSIL FUELS.**
- ❖ **HYDRO ENERGY**
- ❖ **BIOMASS ENERGY AND WIND ENERGY.**

(B) Non-conventional sources of energy:- Which are not used as extensively as the conventional ones and meet our energy requirement only on limited scale.

Geothermal energy and nuclear energy belongs to this category.

(1) SOLAR ENERGY:-

- The energy produced by the sun in the form of heat and light energy is called as solar energy.
- Solar radiations can be converted electricity through solar cells (photovoltaic cells).
- Photovoltaic cells convert solar radiations directly into electricity through silicon solar cells.
- Solar cookers are painted black from outside and a large glass plate to trap solar radiations by green house effect.

Advantages:-

- (a) Eco friendly.
- (b) Renewable.
- (c) Used in rural areas.
- (d) Retains all the nutrients in food to slow cooking.

Disadvantages:-

- (a) Silicon cells are expensive.
- (b) Solar radiations are not uniform over the earth's surface.
- (c) Cannot be used at night or on cloudy days.
- (d) In solar cooker maximum temperature of 100 degree Celsius can be achieved.

(2) WIND ENERGY:-

- When large masses of air move from one place to another then it is referred to as wind . During this process kinetic energy gets associated with it which is referred as wind energy.
- It can be converted into mechanical and electrical energy.
- Kinetic energy of wind is used in running of windmills, which are used to lift water, grind grains etc.

Uses of wind energy:-

- It is used to drive windmills, water lifting pumps and flour mills etc.
- It is used to propel sail boats.
- It is used to fly engine fewer airplanes or gliders.
- It is used to generate electricity.

Advantages:-

- Eco-friendly.
- Renewable.

Disadvantages:-

- Wind speed does not uniform always.
- Needs a large area to set up series of windmills.
- Big amount of investment is needed.
- The output is less as compared to investment.

Assignment for you... In your own language try to do question of NCERT text book.