

CBSE Class 10 Science
NCERT Solutions
Chapter -14
Sources of Energy

Page No. 243

1. What is a good source of energy?

Ans. A good source of energy should have the following qualities:

- (a) It should be easily available.
 - (b) It should have high calorific value.
 - (c) It should be easy to store and transport
 - (d) It should be economical
 - (e) It should not cause environmental pollution
-

2. What is a good fuel?

Ans. A good fuel is that which release more heat on burning, is easily available at the economical rate and do not cause environmental pollution.

3. If you could use any source of energy for heating your food, which one would you use and why?

Ans. We shall use LPG/PNG gas or electricity for heating your food because these are pollution free and have high calorific value.

Page No. 248

1. What are the disadvantages of fossil fuels?

Ans. There are following disadvantage of fossil fuels:

- (a) Burning of fossil fuels causes' pollution.
 - (b) Oxides of Sulphur and nitrogen produced on burning of fossil fuel causes acid rain.
 - (c) Carbon dioxide causes greenhouse effect.
 - (d) Fossil fuels are non-renewable sources of energy.
-

2. Why are we looking at alternate sources of energy?

Ans. Fossil fuels are non-renewable sources of energy and their reserves are limited one. Hence, we need to conserve them. If we continue consuming these sources at same rate as presently, we may soon run out of energy. To avoid such a situation, we are looking for alternative sources of energy.

3. How has the traditional use of wind and water energy been modified for our convenience?

Ans. To use energy of flowing water large dams are built in hilly regions to store huge amount of water at a height. This water is used to produce hydroelectricity.

Wind energy is used to generate electricity by using windmill that converts the wind energy into electricity.

Page No. 253

1. What kind of mirror –concave or convex or plain –would be best suited for use in a solar cooker? Why?

Ans. Large sized concave mirrors are best suited for use in solar cooker, because they focus large amount of solar radiation on a small surface area so temperature will rise quickly.

2. What are limitations of the energy that can be obtained from the oceans?

Ans. Limitations of energy obtained from oceans:

- (a) There are very few locations where dams to utilize tidal energy can be built.
-

(b) Cost of installation of power houses is extremely high and efficiency of plants is comparatively small.

(c) Power plants built in oceans will need high continuous maintenance.

3. What is geothermal energy?

Ans. Geothermal energy is the heat energy present inside the earth in certain regions called hot spots. When underground water comes in contact with the hot spot, steam is generated. This steam is routed through a pipe to a turbine and used to generate electricity.

4. What are the advantages of nuclear energy?

Ans. Main advantages of nuclear energy are as follows:

(a) For given mass fuel consumed the amount of energy released is very large.

(b) Nuclear power plants can be designed and constructed at any place.

(c) If proper precautions are taken while running nuclear power plants, a major fraction of energy need can be obtained from nuclear energy sources.

Page No. 253

1. Can any source of energy be pollution free? Why or why not?

Ans. No, source of energy is completely pollution free. A source of energy to be pollution free if neither it causes any pollution during its actual operation nor there any pollution during assembly of devices utilizing that source of energy. Solar cell device may have caused some pollution.

2. Hydrogen has been used as rocket fuel; would you consider it a clear fuel than CNG? Why or why not?

Ans. Hydrogen can be considered a cleaner fuel because its burning produces water vapour which is non-polluting. However, due to explosive nature of hydrogen, its storage and

transportation is difficult.

Page No. 254

1. Name two energy sources that you would consider to be renewable. Give reasons for your choices.

Ans. Solar energy, wind energy, ocean energy etc. are renewable sources of energy due to the following reasons:

- (a) These forms of energy are available in plenty in our natural environment.
 - (b) These energy sources will not be depleted because their supply is large and extraction of usable energy from these sources is negligible.
-

2. Give the names of two energy sources that you would consider to be exhaustible. Give reasons for your choices.

Ans. Coal and petroleum are two exhaustible sources of energy. These fuels were formed over million for years ago and there are only limited reserves. If we continue to use them as at present, these reserves will be exhausted soon.

TEXTBOOK EXERCISES

1. A solar water heater cannot be used to get hot water on

- (a) a sunny day
- (b) a cloudy day.
- (c) a hot day
- (d) a windy day.

Ans. (b) cloudy day.

2. Which of the following is not an example of a bio-mass energy?

- (a) wood
- (b) gobar-gas
- (c) nuclear energy
- (d) coal

Ans. (c) nuclear energy

3. Most of the sources of energy we use represent stored solar energy. Which of the following is not ultimately derived from the Sun's energy?

- (a) geothermal energy
- (b) wind energy
- (c) nuclear energy
- (d) bio-mass

Ans. (c) nuclear energy

4. Compare and contrast fossils fuels and the Sun as direct sources of energy.

Ans. Distinction between fossils fuels and Sun energy:

| Fossil fuels | | Sun energy | |
|--------------|--|------------|---|
| i. | These are non-renewable and exhaustible sources of energy. | i. | Sun is a renewable and inexhaustible source of energy. |
| ii. | Combination of these causes pollution. | ii. | It does not cause pollution or degradation of environment. |
| iii. | Fossil fuels are costly but energy can be obtained easily. | iii. | It is freely available but devices used to harness it are costly. |

5. Compare and contrast bio-mass and hydro electricity as sources of energy.

Ans. Difference between bio-mass and hydroelectricity:

| Bio-mass energy | | Hydro electricity | |
|------------------------|---|--------------------------|--|
| i. | Bio-gas plant is cheap, small in size and can be installed anywhere. | i. | It can be generated only at few places in hilly terrain by constructing dam over river. |
| ii. | These utilize wastes bio-mass materials like cow dung, plant residue, vegetable waste and sewage etc. | ii. | These utilize kinetic energy of flowing water or potential energy of water stored at a height. |

6. What are the limitations of extracting energy from:

(a) the wind?

(b) waves?

(c) tides?

Ans. Limitation of extracting energy from the wind:

- i. It can be established at those places only, where wind blows for the greater part of a year.
- ii. Wind speed should be higher than 15 km/h.
- iii. It requires high level of maintenance.

Limitation of extracting wave energy and tidal energy:

- i. It can be harnessed by trapping the sea waves in a dam. Only very few suitable sites exist where dams can be constructed.
- ii. It is not a continuous and reliable source of energy.
- iii. it is extremely costly and difficult to use.

7. On what basis would you classify energy sources as

(a) renewable and non-renewable?

(b) exhaustible and inexhaustible?

Are the options given in (a) and (b) the same?

Ans. (a) Renewable sources of energy are those sources which can be regenerated again. Non-renewable sources of energy are those sources which would get depleted some day and cannot be regenerated.

(b) Exhaustible sources of energy are those which will be exhausted some day and cannot be regenerated. Inexhaustible sources of energy are those which can be regenerated again due to some continuing or repetitive currents of energy and are inexhaustible.

Options in both cases are exactly same.

8. What are the qualities of an ideal source of energy?

Ans. The qualities of ideal sources of energy are:

(a) It should be easily accessible, inexhaustible and a renewable source of energy and cost of harnessing energy should be reasonably small.

(b) It should be easily stored and transported.

(c) It should have high calorific value.

(d) It should be pollution free.

9. What are the advantages and disadvantages of using a solar cooker? Are there places where solar cookers would have limited utility?

Ans. Advantage of solar cooker:

a. There is no cost of fuel.

- b.** It is environment friendly and there is no residue like ash etc.
- c.** Cooking is hygienic and nutritious.

Disadvantage of solar cooker:

- a.** The cooking is slow.
 - b.** It cannot be used at all times.
 - c.** A solar cooker can perform only limited functions.
-

**10. What are the environmental consequences of the increasing demand for energy?
What steps would you suggest to reduce energy consumption?**

Ans. The increasing demand for energy is largely being met by the use of fossil fuels. But these fuels are exhaustible and non-renewable sources of energy. Moreover, burning of fossil fuels cause air pollution. Release of acidic oxides leading to acid rain that affect our water and soil resources. These gases also produce greenhouse effect leading to increase the temperature of earth.

To reduce energy consumption we should lead a simple and a natural life. As an example, instead of using an air conditioner in a closed room we should live in an airy room having appropriate number of windows.