



SpeedLabs
Science

CBSE 10th

TEEVRA EDUTECH PVT. LTD.

Source of energy

Example

1. What is a good source of energy?

Ans. A good source of energy fulfils the following criteria.

- (i) It produces a lot of heat per unit mass.
- (ii) It does a huge amount of work per unit mass.
- (iii) It is easily accessible.
- (iv) It is easy to store and transport.
- (v) It is economical.
- (vi) It produces less amount of smoke.

2. What is a good fuel?

Ans. A good fuel produces a huge amount of heat on burning, does not produce a lot of smoke, and is easily available.

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

Ans. Natural gas can be used for heating and cooking food because it is a clean source of energy. It does not produce huge amount of smoke on burning. Although it is highly inflammable, it is easy to use, transport, and it produces a huge amount of heat on burning.

4. What are the disadvantages of fossil fuels?

Ans. The disadvantages of fossil fuels are as follows.

- (a) Burning of coal and petroleum produces a lot of pollutants causing air pollution.
- (b) Fossil fuels release oxides of carbon, nitrogen, sulphur, etc. that cause acid rain, which affects the soil fertility and potable water.
- (c) Burning of fossil fuels produce gases such as carbon dioxide that causes global warming.

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

Ans. Fossil fuels, which have been traditionally used by human beings as an energy sources, are non-renewable sources of energy. These sources of energy are limited and cannot replenish on their own. They are being consumed at a large rate. If this rate of consumption continues, then the fossil fuels would be exhausted from the Earth. Therefore, we have to conserve the energy sources. Hence, we should look for alternate sources of energy.

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

Ans. Traditionally, waterfalls were used as a source of potential energy which was converted to electricity with the help of turbines. Since waterfalls are few in number, water dams have been constructed in large numbers. Nowadays, hydro-dams are used in order to harness potential energy of stored water. In water dams, water falls from a height on the turbine, which produces electricity.

Earlier, the windmills were used to harness wind energy to do mechanical work such as lifting/drawing water from a well. Today, windmills are used to generate electricity. In windmills, the kinetic energy of wind is harnessed and converted into electricity. The rotatory motion of the blades turns the turbine of the electric generator to generate electricity.

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

Ans. No source of energy can be pollution-free. It is considered that solar cells are pollution-free. However, even their making causes environmental damage indirectly.

Also, in the case of nuclear energy, there is no waste produced after the fusion reactions. However, it is not totally pollution-free. To start the fusion reactions, approximately 10^7 K temperature is required, which is provided by fission reactions. The wastes released from fission reactions are very hazardous. Hence, no source of energy is pollution-free.

8. Hydrogen has been used as a rocket fuel. Would you consider it a cleaner fuel than CNG? Why or why not?

Ans. Hydrogen gas is cleaner than CNG. CNG contains hydrocarbons. Therefore, it has carbon contents. Carbon is a form of pollutant present in CNG. On the other hand, hydrogen is waste-free. The fusion of hydrogen does not produce any waste. Hence, hydrogen is cleaner than CNG.

9. What is geothermal energy?

Ans. Geothermal power plants use heat of the Earth to generate electricity. This heat energy of the Earth is known as geothermal energy.

When there are geological changes, the molten rocks present in the core of the earth are pushed to the earth's crust. This forms regions of hot spot. Steam is generated when the underground water comes in contact with these hot spots forming hot springs. This trapped steam is used to generate electricity in the geothermal power plants.

10. What are the advantages of nuclear energy?

Ans. The advantages of nuclear energy are as follows.

- (a) Large amount of energy is produced per unit mass.
- (b) It does not produce smoke. It is a clean energy.

(c) Fission of one atom of uranium produces 10 million times the energy released by burning of one atom of carbon.

(d) Fusion of four hydrogen atoms produces huge amount of energy approximately equal to 27 MeV.

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

Ans. Two renewable sources of energy are as follows.

(a) Sun. The energy derived from the Sun is known as solar energy. Solar energy is produced by the fusion of hydrogen into helium, fusion of helium into other heavy elements, and so on. A large amount of hydrogen and helium is present in the Sun. Therefore, solar energy can replenish on its own. The Sun has 5 billion years more to burn. Hence, solar energy is a renewable source of energy.

(b) Wind. Wind energy is derived from air blowing with high speed. Wind energy is harnessed by windmills in order to generate electricity. Air blows because of uneven heating of the Earth. Since the heating of the Earth will continue forever, wind energy will also be available forever.

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

Ans. Two exhaustible energy sources are as follows.

(a) Coal. It is produced from dead remains of plants and animals that remain buried under the earth's crust for millions of years. It takes millions of years to produce coal. Industrialization has increased the demand of coal. However, coal cannot replenish within a short period of time. Hence, it is a non-renewable or exhaustible source of energy.

(b) Wood. It is obtained from forests. Deforestation at a faster rate has caused a reduction in the number of forests on the Earth. It takes hundreds of years to grow a forest. If deforestation is continued at this rate, then there would be no wood left on the Earth. Hence, wood is an exhaustible source of energy.