

ENERGY



Nuclear power plant

About 10% of the world's electric power is produced by nuclear power plants. Nuclear power **requires** little **fuel** and causes much less air **pollution** than other power plants, but it can cause severe health and environmental problems when accidents **occur**, with a consequent release of radioactive material. This type of energy is produced by the **splitting** of atoms of uranium, which **releases** heat. This process – called fission – produces large amounts of **steam**, which is used to turn the **blades** of **turbines** thus creating energy. The main problems with nuclear power are linked to the location of the power plants, as people are not **willing** to have these plants near their homes, and the disposal of **waste** material, which stays radioactive for centuries.

Thermoelectric power plant

They provide about $\frac{2}{3}$ of the world's electricity. These plants burn fossil fuels, such as coal, oil or natural gas, which are all non-**renewable** resources. This means that in the future there will be a limited **supply** of these resources. The main advantage of thermoelectric power plants is that they are **reliable** and can meet the demand in peak periods. Electricity is generated by heating water in a **boiler** to create steam, which is then pressurised and used to turn the blades of giant turbines that produce electricity. These power plants cause environmental pollution because of the combustion of fossil fuels which release carbon dioxide.

Hydroelectric power plant

The energy produced by water can be captured and turned into electricity. The use of a **dam** on a river allows hydroelectric power plants to store water in an artificial lake, or reservoir. When released, the force of the water spins the blades of giant turbines, which are connected to a generator producing energy. Hydropower is one of the most important renewable energy resources, because it is reliable, efficient and does not pollute the air. Although it has high initial costs, it is cheap to operate. Unfortunately, it has a great impact on the **environment**, as humans, animals and plants may lose their natural habitats.

Read the texts and decide if the sentences are True or False. Write T or F

- 1 Nuclear power plants do not produce air pollution at all. ☐
- 2 Accidents in nuclear power plants can have terrible consequences for the environment. ☐
- 3 Nuclear power plants produce biodegradable waste material. ☐
- 4 Thermoelectric power is generated by the combustion of renewable resources. ☐
- 5 Thermoelectric power plants are environmentally friendly. ☐
- 6 Dams are built on rivers to store water. ☐
- 7 The water released from the reservoir flows through the generator. ☐
- 8 The only disadvantage of hydropower is its high initial cost. ☐

Reorder the different stages in the distribution system and match them to the numbers in the picture.

a- Transmission lines carry high-voltage electricity to different substations.

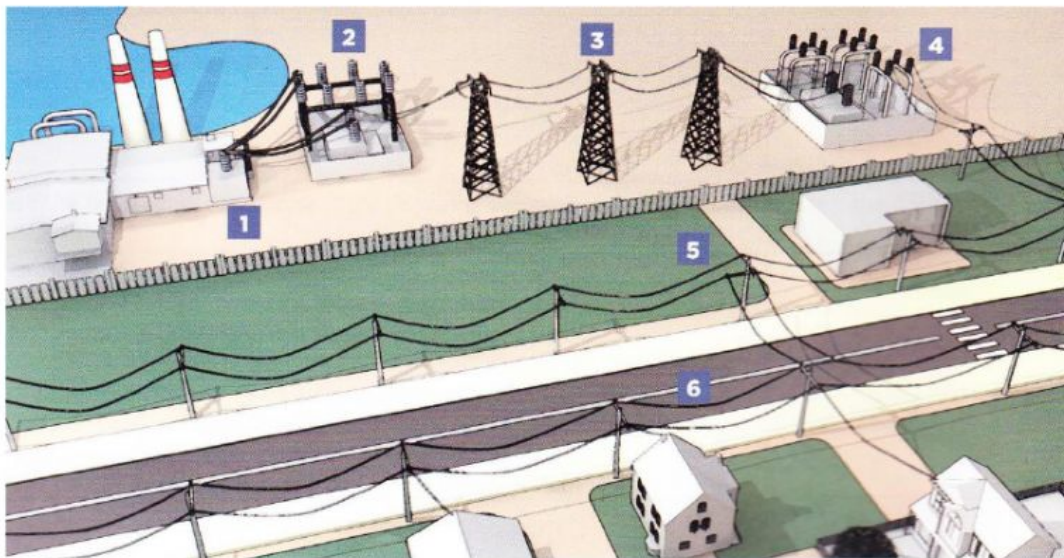
b - Electricity leaves the power plant.

c- Electricity is stepped down by transformers.

d- Current at lower voltages is transmitted to homes and offices.

e -The voltage is increased at a step-up station.

f -Power levels are lowered by small transformers mounted on poles.



Read the text about the electrical distribution system and complete it with the words in the box.

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|--------------|----------|----------------|-----------|--------------|
| POLE | DEMAND | LOWER VOLTAGES | CONSUMERS | HIGH VOLTAGE |
| POWER PLANTS | DELIVERY | APPLIANCES | NETWORK | TRANSFORMERS |

Electricity distribution is the final stage in the of electricity to end users. In order to be able to use electric power for our daily activities, electricity must be transmitted from the to other areas where it can be distributed to different .

The electricity generated by power plants is increased or **stepped up** at substations and distributed through transmission lines, in order to minimize energy **losses** and to economise on the material needed for conductors. Transmission lines use voltages as high as 765,000 volts and they are usually connected in a . This means that if a station receives an unexpected for electric power, it can call on the other stations to help to meet the demand.

Then electrical power is converted from high voltage to thanks to step-down transformers which turn electricity into different power levels. Once it is sent to your neighborhood, another small mounted on a converts the power to even lower levels to be used at home. The final voltage is between 110 volts - for lights, TVs, and other smaller appliances - and 240 volts for larger .