

HOW ENERGY IS PRODUCED -KEY TO TASKS

1

1 B 2 A 3 C

2

1 F They produce less air pollution than other power plants.

2 T

3 F They produce waste material which stays radioactive for centuries.

4 F It is generated by the combustion of fossil fuels, which are non-renewable resources.

5 F They cause environmental pollution.

6 T

7 F It flows through giant turbines.

8 F The main disadvantage is its impact on the environment.

3

| Type of energy | How it works | Advantages | Disadvantages |
|-------------------|--|--|--|
| Solar energy | Solar cells made of silicon absorb sunlight, which knocks electrons loose, allowing them to flow freely and produce electricity. | The PV system provides an independent, reliable electrical power source and its routine maintenance is simple and cheap. | high initial costs |
| Wind energy | The wind turns the blades of giant turbines, producing kinetic energy which is then converted into mechanical power and electricity by a generator. | It is one of the cheapest renewable technologies available today. | There are few suitable wind sites. |
| Tidal energy | Underwater turbines capture the kinetic energy of rising and falling tides and turn it into electricity. | It is a natural process because it exploits the potential energy of tides. | Only massive increases in tides can produce energy and there are very few places where this occurs. Moreover the changes in the tidal flow can damage the aquatic ecosystem and the shoreline. |
| Geothermal energy | The hot water stored in the Earth is brought to the surface and used to drive turbines to produce electricity or it can be piped through houses as heat. | It is cheap and has a low impact on the environment. | There are few sites where it can be extracted at low cost. |
| Biomass energy | Plant material and animal waste are burnt in order to release chemical energy as heat. | It is a natural process, is carbon neutral and has low initial costs. | It has a smaller potential than other energy sources and requires excellent maintenance skills. |

4

1 c 2 f 3 h 4 a 5 g 6 d 7 b 8 e

5



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

The electricity generated by power plants is increased or stepped up at substations and distributed through high-voltage 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 network. This means that if a station receives an unexpected demand 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 lower voltages thanks to step-down transformers which turn electricity into different power levels. Once it is sent to your neighbourhood, another small transformer mounted on a pole 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 appliances.

1 delivery

2 power plants

3 consumers

4 high-voltage

5 network

6 demand

7 lower voltages

8 transformer

9 pole

10 appliances

6

1 b 2 e 3 a 4 c 5 f 6 d

7

1 d 2 f 3 c 4 a 5 b 6 e