**Alternative power sources**

 **Read the texts about alternative power sources and complete the table with the missing information.**

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| --- | --- |
| Environmental problems such as the **greenhouse****effect** and air pollution have led scientists to findalternative power sources which are renewable andless polluting.**SOLAR ENERGY**Sunlight can be directly converted into electricity bysolar cells made of silicon. When light strikes thecells, a part of it is absorbed by the semiconductormaterial. The energy of the absorbed light **knocks**electrons loose, allowing them to flow freely andproduce electricity. The process of converting light(photons) into electricity (voltage) is known as thephoto-voltaic process (PV). Solar cells are usuallycombined into panels and grouped into **arrays.** Evenif the initial costs can be high, the PV system providesan independent, reliable electrical power source. Itcan produce energy for more than 15 years and itsroutine **maintenance** is simple and cheap.**WIND ENERGY**Wind energy is one of the cheapest renewabletechnologies available today. The wind turns theblades of giant turbines, producing in this way kineticenergy which is then converted into mechanicalpower and electricity by a generator. The maindisadvantage of wind energy is that there are fewsuitable wind sites where it is possible to have aconstant production of electricity.**TIDAL ENERGY**This alternative power source, which is typically usedin coastal areas, turns the potential energy of **tides**into electricity. Tidal power generators use rising andfalling tides in much the same manner as hydroelectric | power plants. Large underwater turbines are placedin areas with high tidal movements and are designedto capture the kinetic energy of rising and fallingtides. The turbines are driven by the power of the seaboth when the tide comes in and when it goes out.The problem with tidal power is that only massiveincreases in tides can produce energy and there arevery few places where this occurs. Moreover, theaquatic ecosystem and the **shoreline** can be **damaged** by the changes in the tidal flow.**GEOTHERMALENERGY**In the past, people used **hot springs** for bathing,cooking and heating. Geothermal energy is based onthe fact that the Earth is hotter below the surface.The hot water which is stored in the Earth can bebrought to the surface and used to drive turbines toproduce electricity or it can be **piped** through housesas heat. This energy is cheap and has a low impacton the environment, but there are few sites where itcan be extracted at low cost.**BIOMASS ENERGY**Biomass is a renewable energy source deriving fromplant material and animal waste. When it is burnt, itreleases its chemical energy as heat. Biomass fuelsinclude forest residues (such as dead trees, branchesand tree **stumps), straw, manure** and even municipalsolid waste. Biomass energy is a natural process, it iscarbon neutral and has low initial costs. It used to bethe main source of heating at home in the past and itcontinues to be highly exploited in the developingworld. The main disadvantage of biomass is that ithas a smaller potential than other energy sources andrequires excellent maintenance skills. |

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| **Type of energy** | **How it works** | **Advantages** | **Disadvantages** |
|  |  |  | High initial costs |
| Wind energy |  |  |  |
|  |  | It is a natural process because it exploits the potential energy of tides |  |
|  |  |  |  |
|  |  |  |  |

**Match the words with their definitions.**

1 array

2 kinetic

3 tide

4 hot spring

5 to pipe

6 manure

7 waste

8 maintenance

**A** a spot where hot water comes up naturally from the ground

**B** unwanted material left after using

**C** a group of things arranged in a particular way

**D** waste material from animals used as fertiliser

**E**  the process of keeping something in good condition by regularly checking it

**F**  produced by motion

**G**  to send a liquid or a gas through a tube

**H** the regular change in the level of the sea caused by gravitational attraction of the

 moon and the sun