Unit 7 RENEWABLE ENERGY

LEAD-IN

1. What is renewable energy?
2. Can you name any sources of renewable energy?

Task 1

Complete each gap with one word

Oil, natural gas, uranium, water - as power sources, all have the potential to run _____ during the course of human development, possibly in the next couple of hundred years. Renewable sources can sidestep this problem by _____ energy sources that either will last longer than the human race or can be regenerated through agriculture. Most renewable energy sources are also environmentally friendly, fight global warming by _____ carbon emissions, and allow economies to reduce their dependencies on politically turbulent nations. From 2007 to 2008, the market for the top three renewables - wind, solar, and biofuels - _____ from $75.8 billion to $115.9 billion, or about 53%, indicating that these energy sources are getting more and more popular.

Task 2
What types of energy sources are described below?

1. _____

(...) energy uses hot water deep within the earth's crust to spin turbines and produce power 24 hours a day, seven days a week. It produces few carbon emissions and can re-inject used water back into the earth to be used again, making it fully sustainable. Not every part of the planet has (...) resources; usually, they can be found in regions where there is volcanic activity, or where two tectonic plates meet. This is why places like Indonesia and the Philippines, which are situated on the Pacific "Ring of Fire", or California, with its myriad fault lines and hot springs, are such strong markets for (...) technology..

2. _____

The appeal of (...) power is obvious. It is a virtually limitless resource. It's free of greenhouse gas emissions, widely thought to contribute to global climate change. In developed countries using lots of air conditioners, it generates more electricity exactly when you need it-- at times of peak electricity usage. Once installed, (...) systems can function for 25 or more years with little maintenance or oversight.[13]

(...) comes with limitations, however, with poor cost-efficiency being the most notable. (...) is weather dependent and intermittent, requiring storage or back-up systems to supplement during times of weak generation. More importantly, thanks to fast-rising silicon prices, (...)

systems average $8,000 per kilowatt installed[14] - extremely expensive even in comparison to other renewables. Still, the (...) market has exploded over the past year, with electricity generated from (...) systems increasing from 2.5 GW in 2006 to 3.8 GW in 2007[15].

3. _____

(...) is caused by different parts of the earth heating at different rates to different temperatures, creating pressure gradients and leading air molecules to move from areas of higher pressure (density) to areas of lower pressure (density). It would appear that (...) is the ultimate source of energy, but, like all other renewables, it faces some issues. Not every region has (...) year-round; furthermore, turbines are very dangerous for birds, particularly during migrations. (...) parks can also "overproduce" sometimes, creating more electricity than needed by the utilities grid, though there are massive batteries being developed to store some of this excess energy for periods when the (...) is weaker than needed.

(...) turbines have the lowest installation costs of any of the renewables, and with large (...) installations taking advantage of economies of scale to reach lows of $800 per kilowatt installed[16], today it rivals natural gas as a form of cheap, base-load energy.

4. _____

(...) uses the kinetic energy from ocean to generate electricity. Most (...) energy producers are private labs and emerging companies, but Ocean Power Technologies has emerged as the first publicly-traded (...) power producer in the U.S.

5. _____

(...) are sources of energy that are renewable in the truest sense of the word. They are made from plant matter; since plants can be regrown, the energy source can be renewed. Major (...) include ethanol cellulosic ethanol, though there are currently private companies working on refining biogasoline.

Match the highlighted words with their definitions below

1. equipment that can be used when extra help is needed
2. a public service such as gas, water or electricity that is used by everyone
3. at its highest or greatest level
4. happening sometimes, but not regularly
5. capable of continuing for a long time at the same level
6. a set of wires that carries the electricity supply

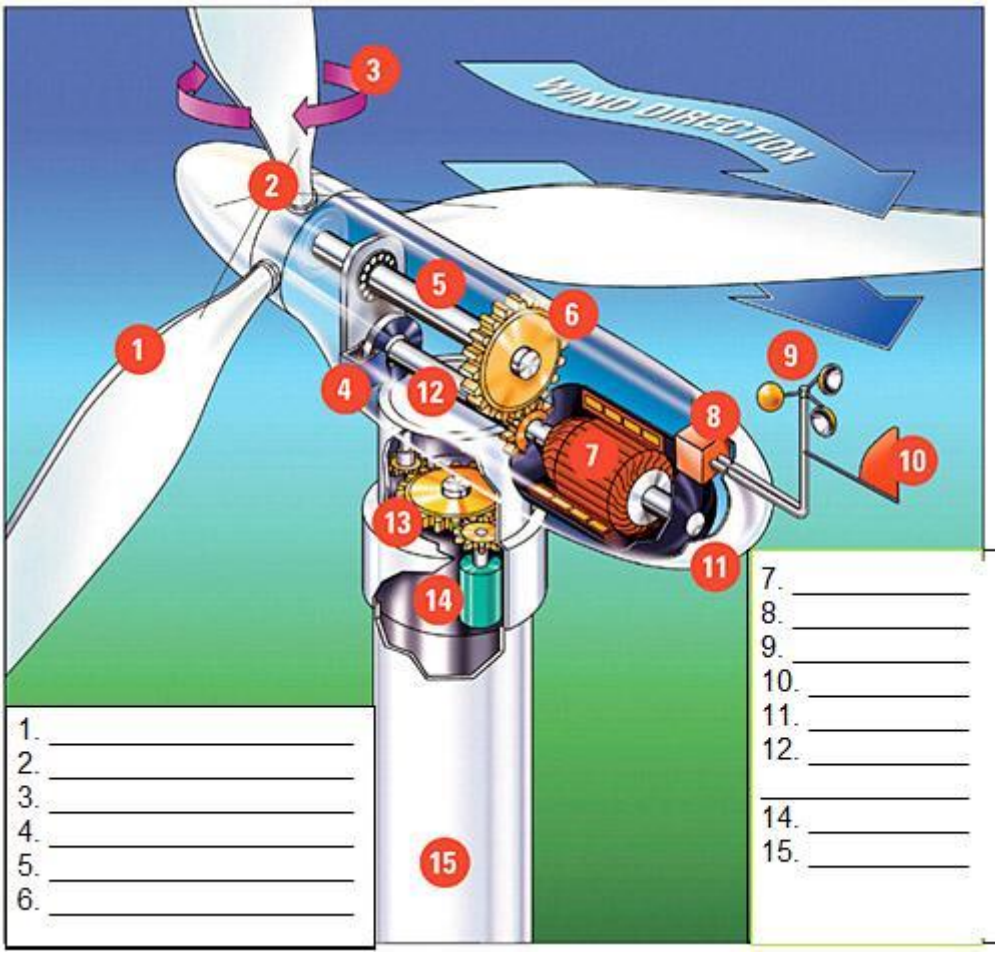
Task 3

Match the terms with their Polish equivalents.

1. Nacelle	A. Wał wysokoobrotowy
2. Gear box	B. Wieża
3. Pitch	C. Hamulec
4. Wind vane	D. Wał niskoobrotowy
5. Generator	E. Łopaty wirnika
6. Blades	F. Napęd ustawienia kierunku
7. Brake	G. Skrzynia przekładniowa
8. Tower	H. Urządzenie sterujące
9. Controller	I. Wirnik
10. Yaw motor	J. Generator
11. Yaw drive	K. Wiatrowskaz
12. Anemometer	L. Nastawny skok
13. Rotor	M. Gondola
14. High speed shaft	N. Silnik ustawienia kierunku
15. Low-speed shaft	O. Anometr

Task 4

Now use the words above to describe the picture of a wind turbine



Task 5

Try to guess what the missing words are. Then listen and check

Attached to the nacelle are three propeller- like (1) _____.

Also on the nacelle is an (2) _____ to measure wind speed and direction.

The wind direction (3) _____ the nacelle.

The rotor connects to the main (4) _____

The energy in the wind, called (5) _____ energy, turns the turbine blades around the (6) _____.

For this wind turbine, a step-up (7) _____ inside the nacelle increases electrical generation.

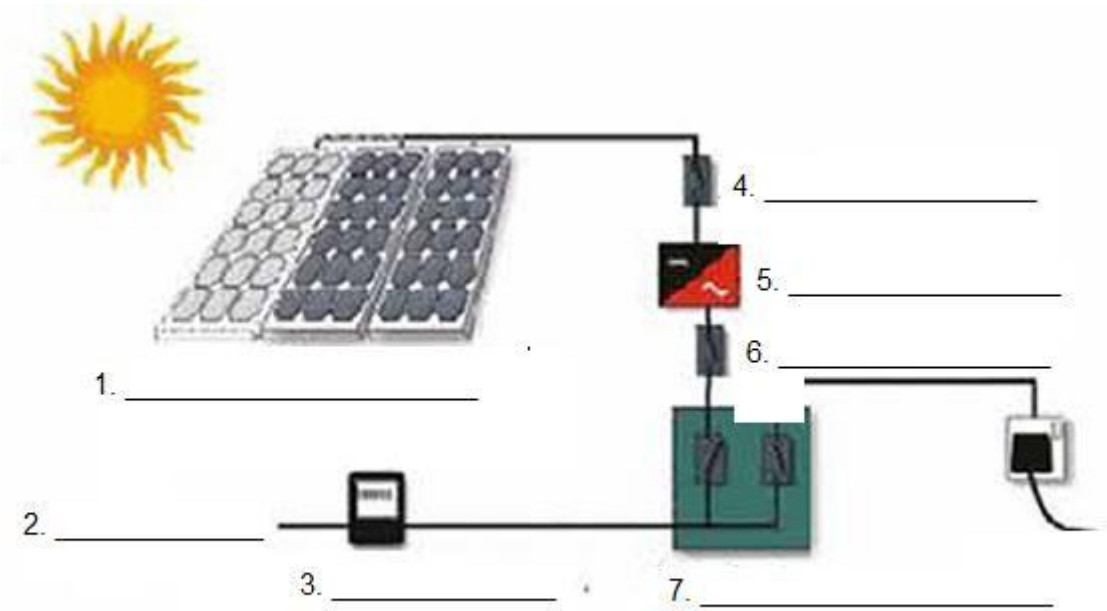
The electricity generated then travels down large cables from the nacelle through the (8)_____ and into underground cables.

The cables take the electricity generated from all wind turbines to a (9)_____

Task 6

Describe the picture using the terms below

AC mains supply, AC side isolation switch, DC side isolation switch, meter, PV array, inverter, main fuse box



Task 7

Can you guess what terms the sentences define?

1. A collection of photovoltaic modules electrically wired together in one structure to produce a specific amount of power. _ r _ _ _
2. Any device or appliance in an electrical circuit that uses power, such as a light bulb. L_ _ _
3. Electrical current (flow of electrons) in which the direction of flow is reversed at constant intervals, such as 60 cycles per second.
4. Electric current (flow of electrons) in which the flow is in only one direction.
5. A substance that allows some of electricity to pass through it _ _ _ i _ _ _ _ _ _ _ _ _

Task 8

Now use the words above to fill in the gaps

Photovoltaics (PV) or solar cells as they are often called, are (1) _____ devices that convert sunlight into (2) _____ electricity. Groups of PV cells are electrically configured into modules and(3) _____, which can be used to charge batteries, operate motors, and to power any number of electrical (4) _____. With the appropriate power conversion equipment, PV systems can produce (5) _____ compatible with any conventional appliances, and can operate in parallel with, and interconnected to, the utility grid.