

Wind Energy



Renewable Energy:

When we speak of renewable energy, we are talking about energy that constantly replenishes itself over a short period of time. Generally, these sources are always (or almost always) available to us and will never run out. Some common examples include solar, wind, water, geothermal, etc. These energy sources are much more environmentally friendly compared with non-renewable sources such as fossil fuels and nuclear which produce very harmful byproducts and take billions of years to be created. These harmful byproducts include carbon dioxide and nuclear waste.

Wind Turbines:

In 5,000 BC, the Egyptians used the power of the winds to move their ships across the Mediterranean Sea. This was the first recorded use of wind energy. In 2,000 BC, the civilization of Babylon was the first to use windmills to grind grain, water crops and livestock and carry out other arduous tasks.

The familiar multi-blade windmills were invented in 1850 by the U.S Wind Engine Company and by the year 1889, there were more than 77 windmill factories in America. In 1890, wind turbines were first used to create electricity for homes and businesses. The wind energy business has seen considerable development over the last 80 years and today, wind energy accounts for approximately 4% of the global energy production (Dodge, 2014).



Windmill

Reading Sample

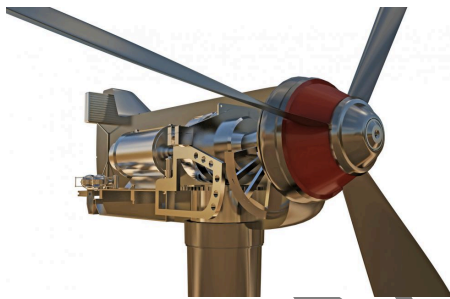


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Wind turbines are mainly used by farms, which are located in far off areas without any direct contact with the electrical grid, and by utilizing the wind turbines; the farms are able to produce free electricity for themselves without relying on the grid.

How they work:

Wind turbines are engineering masterpieces with blades 50 – 60 metres (164 - 197 feet) long that can spin at 15-20 revolutions per minute and power between 1,500 and 3,000 homes each. They



work by harnessing the power of wind to rotate a turbine; this turbine then rotates the shaft of an electric generator that converts the mechanical energy into electrical energy.

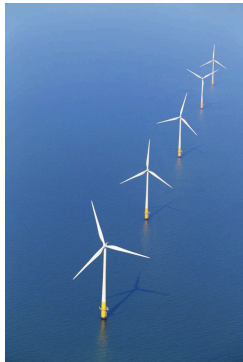
The applications of wind turbines are limitless as they can be built on any geographical location that has winds that are powerful enough to turn the blades. The wind energy is a

renewable source of energy and produces no greenhouse gas in its operation.

Wind Farms:

A wind farm or wind park is a group of wind turbines in a certain location. They can have upwards of several hundred individual wind

turbines or as few as a few dozen. Many wind farms are located offshore so that they can take advantage the strong winds found there.



Wind farms are located all around the world with some of the biggest in Germany, China and the U.S. Specifically, the Gansu Wind Farm in China can produce 6,000 megawatts of power and the largest offshore wind farm in



California can produce 1,020 megawatts! In comparison, the largest nuclear plant in Japan has a capacity of 8,000 megawatts and the largest fossil fuel burning plant produces 22,500 megawatts and is located in China.

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The Controversy:

A lot of controversy is associated with wind turbines, numerous people who reside near wind farms have complained that the wind turbines disrupt their local environment, kill migrating birds and cause noise pollution. Although their claims are in dispute, this fear can cause considerable hindrance in the successful implementation of wind turbines in new areas (Gray, 2010). Furthermore, wind farms take up an enormous amount of space, with hundreds of square miles needed for a large farm. However, most of that land is available for other purposes as the wind turbines themselves only take up approximately 1% of the land.

Reading Comprehension Questions

1. What
2. Other
3. How do wind turbines create electricity?
4. Why
5. What is a wind farm?
6. How much more energy can the Japanese fossil fuel plant produce compared to the Gansu Wind Farm?
7. What

Extension Questions

For the next three questions, please go to the following site using the provided URL or the QR code.



<http://goo.gl/MOUXIA>

8. What
9. Why are
10. How do bladeless wind turbines work?
11. What

Reading Sample



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References

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