

## Just The Basics!!

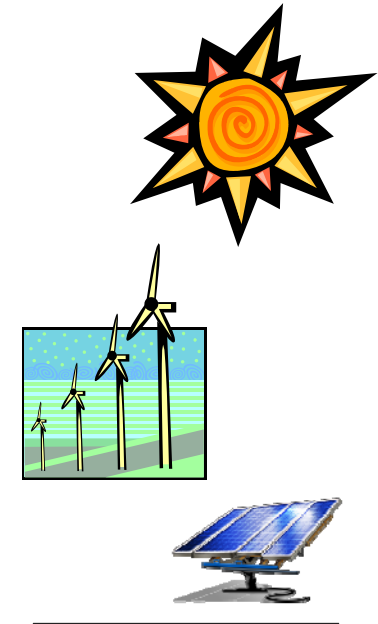
Renewable energy is a phrase most people hear frequently these days. But what are the common types renewable energy?

How do they work?  
Where can you find more information about the technology?

This pamphlet should provide a quick overview of several common forms of renewable energy.

The information contained in this article is from a trustworthy source, however, it has not been subjected to a peer-review process.

UNIVERSITY  
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*What is  
Renewable  
Energy??*

## Wind Energy

**Wind:** Wind is the sun's energy being converted to a kinetic, or moving, form of energy. This occurs because of the inconsistent nature of the planet and the uneven warming that occurs across it.

“Small Wind” – Small wind is the term typically used to describe residential or farm scale wind energy production. Generally this means less than ten kilowatts of electricity being generated by one relatively small wind turbine. This electricity is mainly used on site by the homeowner or farmer whose property it is on. This can be a wind powered water well or a turbine in place to power a house or shop. In some situations excess electricity produced can go onto the main power grid if the equipment is in place to do so.



“Community Wind” – Community wind is the term typically used to describe a medium sized wind turbine that produces electricity for a school, community building or whole community in the case of a remote village.

“Big Wind” or “Wind Farm” – This term usually refers to utility scale wind energy production. They are typically a grouping of many extremely large wind turbines that produce many megawatts of energy. These big projects are of a similar scale to traditional power plants.

For more information regarding wind energy take a look at the following links:

American Wind Energy Association

<http://www.awea.org/>

Wind Powering America

<http://www.windpoweringamerica.gov/>

## Geothermal

**Geothermal:** Geothermal energy is the heat of the earth. Far beneath the earth's surface are hot water or steam reservoirs that can be drawn upon to generate electricity by spinning a turbine. Nearer the Earth's surface the ground temperature remains a fairly consistent 50-60 degrees Fahrenheit. There are several ways that this energy can be harnessed to generate either heat or electricity.

Direct Use Geothermal – Direct use involves drilling a deep well and using the hot water directly piped from the ground for things like heating.

Geothermal Electricity Production – Most traditional electricity producing facilities boil water to create steam which rotates a turbine that runs a generator which produces electricity. There are now several ways to produce the steam necessary for this process through the use of underground hot water reservoirs.



Geothermal Heat Pumps – This system uses the consistent temperature of the ground just below the Earth's surface to help regulate a building's temperature. In the winter the heat exchanger draws on the ground heat and a system of pipes and duct circulates it through the building. In the summer, the process is reversed and warm air from the home is pumped into the heat exchanger. When there is excess heat, this system can also be used to heat water.

For more information about geothermal energy check out:

The National Renewable Energy Laboratory at [http://www.nrel.gov/learning/re\\_geothermal.html](http://www.nrel.gov/learning/re_geothermal.html)

## Solar Energy

**Solar Energy:** Solar energy is the energy of the sun. There are several ways being used to harness this energy for direct or passive use. Here are a few of the most common applications.

Concentrating Solar Power – The sun's heat is concentrated by reflecting surfaces that use solar energy to heat up fluid which is then used to either drive a steam turbine or the moving components of a generator creating electricity.

Passive Solar Heating – A building can be designed to take advantage of the heat produced by the sun every day. This approach does not create electricity, but it may decrease the need for other heating systems.

Photovoltaic – Solar cells, also known as photovoltaics or (PV) absorb sunlight and convert it directly into electricity. Solar energy knocks electrons loose from the material the cells are made from and they flow through the material creating electricity.

Solar Hot Water – Water, or another fluid, is run through a series of tubes inside a solar collector heating the liquid. The liquid is then stored for use at a later time. If the storage facility is designed well the amount of absorbed heat lost can be minimal.

For more information about solar energy check out:

The National Renewable Energy Laboratory at

[http://www.nrel.gov/learning/re\\_solar.html](http://www.nrel.gov/learning/re_solar.html)

