What are renewable energy resources?

Renewable energy resources come from the sun, wind, oceans, rivers and plants. They are the oldest, cleanest and in most cases the most efficient forms of energy humans have at their disposal. Unlike fossil fuels, such as oil and coal, they will never run out and will not pollute the environment.

Right now, only 8 percent of our total energy use comes from renewable energy resources. The other 92 percent is primarily made up of fossil and nuclear fuel sources. Fossil fuels have had damaging effects on the quality of our air, water and soil. In order for people to continue to live healthy lives we must increase the use of renewable energy sources.

The three most common natural renewable energy resources are SUN, WIND and WATER. The first and most important renewable energy is solar energy.

What is solar energy?

Solar energy is energy that is produced by our sun. It is the oldest and most efficient form of renewable energy. Ancient Native American tribes like the Anasazi built their homes so that they could utilize the sun's light and warmth. They did this by building their houses within massive rock cliffs that faced to the southwest, the optimal direction for receiving sunlight. In the summer the sun is very high on the horizon, so its light didn't directly enter their homes, allowing the inside of their houses to stay very cool. But in the winter the sun is lower on the horizon and provided direct sunlight and warmth. Their homes were made out of clay, which absorbed and retained the sun's heat. This helped keep the homes warm and comfortable even in the coldest months of the winter. With an understanding of a free, non-polluting natural energy resource, the sun, these ancient people were able to keep their houses cool in the summer and warm in winter.

Today, because of advances in technology, we can use the sun in many more wonderful and efficient ways. Let's take a look at some of the most important and exciting ways the sun can be used.

The first and probably most important way is the ability of the sun to produce electricity.
This is achieved by the use of photovoltaic panels.

These panels are primarily made out of silicon, phosphorus and boron. When the panels are struck by the sun's rays, the combination of these materials produces electricity. This electricity is sent to a battery where it is stored for use. The stored energy can be used to operate computers, lights, televisions, heaters, air conditioners, cars and even video games. And this all occurs without any damage to our environment!

Another way the sun can be used is to heat water. This simple and efficient way of using the sun is called solar thermal technology. It can and is used to heat water for schools and homes and produce electricity for power companies.

**How does solar thermal technology work?**

When the sun's rays hit certain types of materials such as copper and aluminum, they become very hot. Lining containers with copper and aluminum can produce very high temperatures. As water flows through these containers it is heated. This heated water can be used for pool water, shower water or to heat homes. If the water is heated long enough it will boil, producing steam. This steam can be used to turn a turbine, which can produce electricity.

**What is wind energy?**

Wind Energy, like the sun, is virtually non-polluting. Wind energy is used primarily to produce electricity. This electricity can be used to power homes, schools, video games, etc. Wind energy is more efficient in some parts of the country than others, because some parts of the country are windier than others. As wind technology gets better and better, more and more places will be able to utilize the wind's ability to produce power.

**How does wind energy work?**

As wind passes through the blades of a wind machine, such as a windmill, it begins to spin. This in turn spins an engine called a turbine. The turbine is designed to produce electricity as it spins. The electricity that is produced is then sent to a battery, where it is stored for use.

The last form of renewable energy we will discuss is water, also called Hydro-power.
What is Hydro-power?

Hydro-power is using the movement of water to generate electricity. This moving water is provided by rivers, streams and oceans. Like solar and wind power, hydropower has been used for thousands of years. The ancient Greeks used water to help move large water wheels, which helped grind up grain which was then turned into flour for bread.

How does hydro-power work?

Today, dams are used to control the flow of large quantities of water. When water rushes down a river it produces a great deal of natural energy. As the water is funneled through a dam the energy generated by the water can be made to turn large turbines. As the turbines spin, they can produce large amounts of electricity. This electricity is then stored and sent to cities for use. The use of hydro-electric power can be very beneficial, but there can be problems. Sometimes when a river is dammed, it can hurt the wildlife that depends on the river. Fish like salmon, for example, need to swim up river to reach their spawning grounds. If the dam blocks their way, they cannot reproduce. The result is less salmon, which hurts the fishing industry. The lives of people can also be affected by damming.

Those who live above the dam may have their land flooded while people below the dam may no longer be able to take advantage of the river's bounty. It's very important that when a dam is built, we consider the animals and people who live near the river.

Now that we've finished with our discussion of renewable energy resources it's time to look at how you can become an Earth Dog and help improve the way we use energy.

Be an Earth Dog.... Get involved!

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