



CLEAN ENERGY: HOW DOES THAT WORK?

Clean energy is a term mentioned a lot in the news. What does it mean? Clean energy is energy produced from **easily renewable or natural resources**, such as sunlight, wind, water, etc. Clean energy can be large-scale operations, as well as alternatives for the residential household.

Ever wonder how a wind turbine works? How an LED differs from a compact-fluorescent lightbulb? How a tidal fence produces energy? If you have ever wondered about clean energy technologies and how they work, check out the **U.S. Department of Energy's Energy Basics website**. Below are some highlights of energy technologies that might be new to you:

Tidal Fences

Tidal fences look like giant underwater turnstiles. The turnstiles spin via ocean currents in coastal waters to create electricity. They can reach across channels between small islands or across straits between the mainland and an island. Currents may travel 5–9 miles per hour and generate as much energy as winds of much higher velocity. Because seawater has a much higher density than air, ocean currents carry significantly more energy than air currents (wind).

Concentrating Solar Power (CSP)

CSP technologies use mirrors to reflect and concentrate sunlight onto receivers that collect solar energy and convert it to heat. This thermal energy can then be used to produce electricity with a steam turbine or heat engine that drives a generator.



Mirrors used in CSP technology

Light-Emitting Diode (LED)

LEDs are light sources that differ from more traditional sources of light in that they are mini semiconductor devices that produce light when a small electrical current is applied. Applying an electrical current causes electrons to flow from the positive side of a diode to the negative side. At the positive/negative junction of the diode, the electrons slow down to orbit at a lower energy level. The electrons emit the excess energy as photons of light. Because of their long life, durability, and efficiency, LEDs are becoming more common in residential, commercial, and outdoor area lighting applications.

Did You Know?

The 2007 Oregon Legislature created a renewable portfolio standard that requires the largest utilities in Oregon to provide 25 percent of their retail sales of electricity from newer, clean, renewable sources of energy by 2025. How are utilities doing so far?

The two investor-owned utilities, which provide almost 65 percent of Oregon's energy, are on their way to meeting the goal: PacifiCorp will have about 9.1 percent renewables by 2011 and PGE estimates 9.9 percent (source: climatesolutions.org)



Dig Deeper - Clean Energy Technology for your Home

The State of Oregon has a wealth of information for **homeowners or landowners** on alternatives such as **solar power**, **residential wind turbines**, or **micro hydroelectric** options.