Introduction

Without electricity our daily lives would be considerably different. We use it from the moment we wake up to the moment we go to bed. But what is electricity, basically speaking it is the flow of electrons (1). In general when we think of electricity that we use, we are usually thinking of current electricity; however there is also static electricity which is what we experience when we get a shock from walking across a carpet or when we see lightening. Current electricity on the other hand is what we use to power our clocks, stoves, lights, computers, phones and almost every other modern convenience that we use today.

Current electricity is the flow of electrons through a complete circuit. We use this electron flow to generate electrical energy that can be used to do work. We can covert solar energy, mechanical energy, chemical energy and many others sources of energy into electrical energy that we can in turn use to either power electrical devices. Electrical devices often convert electrical energy into another form of usable energy such as heat, light or sound.

There are many ways of generating electrical energy, but many of them are harmful to our environment. We can use hydroelectricity to convert mechanical energy into electricity, but we usually build dams to do this, changes our habitats significantly. We can burn fossil fuels to generate heat that can be turned into electricity but this releases harmful gases into our environment. We are working on new ways of generating electricity that are less harmful to the environment including solar power and wind power, both of which do not produce harmful by-products but as of yet are not quite efficient enough to power everything that we need them to.

Solar power works by converting photons (light) into electrical energy by releasing the electrons from their orbits and creating a flow of electrical current (2). Wind turbines on the other hand produce mechanical (rotational) energy that is converted by a motor into electrical energy.

In the past most household lights were incandescent, made of tungsten filament bulbs. As the electricity moves through the filament, electrons are displaced up one electron orbital (3). As the electrons falls back down to its natural orbital photons of light is produced. Unfortunately a significant amount of heat is also produced, which is wasted energy. New Light emitting Diode (LED) bulbs produce almost no heat and are tremendously more energy efficient.

A combination of a solar cell(s) and an LED bulb is the ideal situation for production useful light without harmful environmental costs.

References: (formally written in the references section, informally included in this section)

1. Science Probe 9
2. <http://www.solarpanelinfo.com/solar-panels/how-solar-panels-work.php>
3. http://www.pa.msu.edu/sciencet/ask\_st/061792.html