UNDERSTANDING SOLAR ENERGY

Light (particularly sunlight) can be used to create heat or generate electrical power. This is referred to as solar energy.
It is a clean form of energy production, which doesn't pollute the environment as some other forms of energy production do.

There are two forms of solar energy. The first is solar thermal conversion, which uses sunlight to create heat and then electrical power. The second is photovoltaic conversion, which uses sheets of special materials to create electricity from the sun. "Photo-" means "light," and "voltaic" means "producing electricity."

Solar Thermal Conversion
Solar thermal conversion systems use reflectors or mirrors to concentrate sunlight to extremely intense levels of heat. (Solar means "of the sun," thermal means "of heat" and conversion means "changing something from one form to another.")
You can understand this better if you consider the example of using a magnifying glass to start a fire. You may have heard of this or even tried it before. You can hold a magnifying glass under the sun, and concentrate the light on a small pile of flammable materials. The magnifying glass will make the sun's heat much stronger, and will light the materials on fire. It has been said that a magnifying glass one meter in diameter, held under the sun, will create a ray hot enough to melt stone.
If you want to experiment, hold a magnifying glass flat under the sun and put your hand under it. Very soon you will need to move your hand away - don't burn yourself.

Solar thermal conversion systems use mirrors or reflectors to concentrate sunlight onto containers full of liquid. Sometimes water is used. Sometimes other liquids are used, which retain heat better than water.

The liquids are heated up to high temperatures, and this produces steam. The steam is used to turn a turbine. The turning motion of the turbine is used to create electricity.

How does a rotating motion create electricity? When you set up a coiled wire or similar device to rotate between two magnets, it generates an electric current. This is how electric generators work, as well as windmills, nuclear power plants, and other energy plants which use such things as coal, gas, or petroleum.
Windmills use the wind to create the turning motion. Nuclear power or fossil fuels are used to heat water up, thus creating steam to turn the turbines.

Solar heating is another form of solar thermal conversion. In solar heating, an absorber is used to take in sunlight and convert it to heat. The absorber could be something simple, like black paint, or it could be a special ceramic material. A heat absorber is considered to a be good one when it collects at least 95 percent of the sun's radiation.

The absorbers are then used to heat a fluid, which is then circulated to warm up buildings or to create hot-water supplies.

Photovoltaic Conversion
As covered above, photo means "light." It comes from the Greek word “phos,” which means "light."

“Voltaic” means, "producing electric current." The word comes from the name of Alessandro Volta, an Italian physicist who was a pioneer in the field of electricity during the 1700's. (His name is also where the word "volt" comes from.)
Photovoltaic means, "creating electrical energy when exposed to light."

A “cell” is a device that produces electricity. An example of an electrical cell is a flashlight battery.

Photovoltaic cells produce electricity when they are exposed to light. They usually consist of panels. The panels contain two layers of different materials.

When light hits these two layers, one of the layers becomes positively charged, and the other becomesnegatively charged.

This works similarly to a regular flashlight battery, which has a positive end and a negative end. When a wire connects the two ends, they produce an electric current.

When the two layers of material in a solar cell are exposed to light, they create an electric current.

The AMOUNT of electricity generated by a solar power cell depends on several factors. Mainly:
-How big is the solar power device, and how much surface is exposed to the sun?

-How strong is the sun? (This depends on time of day, weather, latitude, etc.)

-How long is the solar power device exposed?

-How much impediment is there to the light? (Clouds, mist, dust, dirt, etc.)

In other words, a solar power cell generates electricity faster when the sun (or light) is brighter. A device with larger solar panels will produce more electricity than one with smaller panels. Exposing the cell for a longer period of time will create more electricity than exposing it for a shorter period of time. A panel near the equator will be more effective than one in an arctic region. A solar panel in misty or dusty conditions does not create as much electricity as it would in full, unobstructed sun.
Some solar cells produce only enough current to power small electronic devices, but can be "daisy-chained" (connected together) in order to create more electricity for other items.

Solar cells which produce enough electricity to run larger equipment (such as laptops) may be larger, more expensive, or heavier than the others.

But there are many varieties available. Individuals and companies are consistently striving to create lighter and more efficient portable solar cells.

Solar Energy and the Future

An advantage to solar power is that it can reduce expenses. It can also be portable. When one is backpacking in the wilderness or traveling far from power grids, solar power can provide a means of powering electronic equipment.

Another advantage is, of course, the lack of pollution created by solar energy production. In fact, if all of our electrical energy were produced by such means, we might not be worrying about global warming and the other destructive effects of pollution on our environment.

These threats to our environment also pose a threat to mankind. Solar power could be developed to a point where it, along with other forms of renewable energy, would replace harmful means of electricity production.

Source : http://www.hicow.com/photovoltaic-conversion/solar-thermal/alessandro-volta-1.html