Fun Facts about Solar Energy

The sun gives off more energy in one second than people have used from the beginning of time. The sun is amazing. Without it, none of us would be here, and there would be no life on earth. It is bigger than anything we can really imagine—-a million planet earths would fit inside it! It takes millions of years for the energy from the center of the sun to reach the sun's surface, and then just eight minutes for it to travel the 93 million miles to earth! The sun is so powerful that it gives off more energy in one second than people have used since the beginning of time.

Without the sun, there'd be no life on earth. Plants make food out of sunlight, and then animals eat plants, and then we eat animals (or maybe we just eat plants, if we're vegetarians). Either way, without sunlight, plants couldn't make food, and there would be nothing for us to eat. Not only could plants not make food without the sun, they also couldn't make oxygen, and no animals could breathe, including us!

The sun produces nearly all the heat on the planet. Without the sun, the earth would be freezing cold--minus hundreds of degrees Fahrenheit, almost as cold as space. The sun also makes the wind blow and the ocean currents flow. Its heat makes clouds, rain, snow, and all the weather on our planet, too.

Solar energy just means energy in the form of light or heat that comes from the sun. Solar energy affects us every day. What makes you feel hot lying on the beach on a summer day? Solar energy. What gets your car hot when it's parked in the sun with the windows closed? Solar energy. What makes your solar calculator go? Solar energy. What makes the giant solar panels on satellites work? Solar energy. What makes plants grow? Rain and... solar energy.

Solar energy is not new. Solar energy has existed for five billion years, since the sun was born. And humans have been using solar energy, in its simplest forms, for thousands of years. People used simple magnifying glasses to concentrate the light of the sun into beams so hot they caught wood on fire. The Greeks were the first to use solar architecture, over 2,000 years ago. They built their houses so the sun's rays entered during the winter, but weren't able to enter during the summer. Entire cities were built this way! (They were way ahead of us.) The Romans got the idea to put glass in windows, which allowed the sun's light to pass through but trapped its heat. They even built glass greenhouses so they could have fruit and vegetables all winter.

Some forms of solar energy are relatively new. In the early 1900s, someone in Europe figured out you could make water boil by collecting the sun's heat behind a few panes of glass. That was the first solar hot water heater! Today, more and more people are using special solar panels to turn the sun's light directly into electricity. That technology was only invented only 50 years ago.

Using the sun to heat hot water is called solar thermal energy. Thermal means heat. Basically, solar thermal involves using mirrors to focus the sun's rays onto one central area to collect the heat, and that heats water.

Solar hot water is "regular" hot water. It's the same water we use to wash our hands, our clothes, and dishes, and to take baths and showers.

Turning light into electricity is called solar electricity. Solar electricity is when light from the sun is turned directly into electricity using solar panels on our houses (or businesses and other buildings, even schools). Collecting the sun's light and turning it into electricity is also called photovoltaics, PV for short. "Photo" means light and "voltaic" means electricity.

Solar panels are made out of silicon. Solar electric (PV) panels are made up of something called silicon, basically the same thing as sand. There is more silicon on the planet than almost anything else. Even though you can find silicon almost everywhere, making a solar panel is complex and expensive. The silicon has to be heated to super high temperatures in a big factory, and then formed into very thin wafers. When sunlight hits a solar panel, it makes electrons in the silicon move around. (Electrons are teeny tiny specks—they're way too small for us to see, even under a microscope.) The electrons flow through wires that were built into the solar panel. And presto! We have electricity!

Solar electricity is "regular" electricity. It's the same electricity we use every day to light rooms in our homes and schools, run refrigerators, computers, televisions....and, we want with this electricity, if we have enough solar panels, even a satellite in space!

Solar panels don't work when it's cloudy or at night. When the sun stops shining on a solar panel, its electrons stop moving and electricity stops flowing. So what do you do if you want to be able to read or watch television at night? You use electricity that is stored for you by the electric company. And that's exactly what people do with solar panels on Long Island do. They have the electric company store any extra solar energy they don't use on very sunny days so they can use it on a cloudy day or at night. If the solar panels don't generate enough electricity, they can then go back to buying a little extra from the electric company if they need to, so the electricity never stops.

Solar panels are all around you! Have you seen those big orange signs along the highway with flashing messages about an exit being closed or a traffic jam ahead? Guess what's on top of those signs? There are big solar panels up there. Also, little solar panels are used on solar calculators (the panel is usually in a little strip across the top). Plus, you might have seen solar panels along highways lighting up signs or powering emergency

equipment or roadside telephones. And, more and more you can see solar panels on the rooftops of people's houses. Hundreds of homes just like the one you live in, get their electricity from the sun. There are thousands of homes on Long Island doing just that!

The number of solar panels needed depends on how much electricity is needed.
To figure out how many solar panels a house needs, you have to find out how much electricity you use. First, it's best to try to cut down on your electricity use in other ways, by changing to CFL light bulbs or buying Energy Star efficient appliances, and by turning off lights, TVs and other electronics when not using them. The average size of a solar system that completely powers a house is about 6,000 to 10,000 watts (also called 6 or 10 kilowatts). To make that kind of solar power, you need solar panels on your roof, usually facing south and not shaded by too many trees. And, once you have the solar panels up there, since they have no moving parts, they almost never break, and they last for well over 25 years..

Right now, most electricity comes from power plants powered by fossil fuels. Have you ever thought about what happens when you flip on the light switch and the light turns on? Electricity is flowing to the light bulb, but where does it come from? In the U.S., most of our electricity is made in giant power plants that burn fossil fuels, such as coal, oil or natural gas, or are powered by nuclear energy. Energy from burning coal, oil or natural gas, and even energy used in burning gas our cars, produces a lot of pollution. Per person, people in the United States produce way more "greenhouse gases" than any other people on the planet. Greenhouse gases are substances in the air that trap heat in the atmosphere. As those are increasing at higher levels, it is creating global warming, a change in climate that can affect all living creatures.

Aside from solar energy, there are ordinary ways to use less energy and help the planet. If you're not using a light, or if you're not using the computer, or if you're not watching the TV, turn them off!! Riding your bike or walking or taking the bus or the train instead of getting in a car and driving somewhere saves a lot of energy, too. So does taking shorter showers (that makes me very sad, because I love long showers). Once you start trying to save energy, you'll find that there are some things in your home that you might not have to use at all. Instead of using a clothes dryer, for example, you can dry your clothes outside in the sun. Instead of playing a computer game, you can go do the dishes. (Just kidding! Sort of.) Eating food from your own garden, or food that's grown and put into packages near your home also saves energy. (The label on the package usually says where the food comes from.) Reusing and recycling things saves energy, but it saves even more if you don't use them in the first place! Once you start thinking about it, you'll find there are lots of ways to use less energy. It's even a fun thing to try and do.

Do you wonder if solar energy is so cool, why isn't everybody using it? Even though humans have been using the sun's energy for thousands of years, photovoltaic (solar-electric) technology is still very new, and sometimes it takes time for new things to catch on. And, since solar energy technology has gotten even better in the last ten years, some adults do not realize that it's become as cool as it has. Even if grownups know it works well and want to try new things, it's very hard to switch to a new system once you have another system working already. (We have all those giant coal and oil burning plants already that cost a lot to build, so it may take some time to change to solar power.)

Although it may take a lot of grownups, including those running big businesses and the government, to change power plants to solar, individuals can generate electricity for their own homes and other buildings from the sun today. And, all of us — even kids! — can do our part to help the environment in other ways. Remember we can all try to save energy by turning out lights and turning off computers and televisions, etc., etc. And, we can all recycle. And, we can spread the word about putting solar energy on more buildings.

The exciting news is: People today are just starting to use solar power...YOUR generation will probably use it all the time, almost everywhere. And that will be really cool because it will help our planet a lot more.

Keep learning and thinking more about energy and how you use it... and learning and thinking more about not wasting it (walk or bike ride instead of driving with your family, for example)...and learning about solar energy as a good way to help the planet. And don't forget to talk to your parents and your teachers and other grownups about it. **Maybe by the time you grow up, everyone will be using solar energy!**

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Sources: Solar Energy International and howstuffworks.com.