Solar Power

We are a power hungry world. We burn coal and natural gas to make electricity and use oil to heat our homes and run our machines. We even split atoms to create nuclear power. But all of these energy sources have a cost to the environment. Burning fossil fuels pollute the air, create acid rain and contribute to global warming issues. Yet we need energy. What can we do?

Solar energy comes from the sun. Because the sun never stops shining, it is called a "***renewable resource.***" We use it and more is being made all the time. Solar energy can be collected to heat buildings and water (for washing and bathing). Solar power can charge emergency phones on the highways, streetlights and flashing road signs.

When solar power is made into electricity it is called "***photovoltaics***." Photovoltaic energy is sunlight collected by a "***solar cell***" and passed through a special "***semiconductor***" to create an electrical flow. Most solar semiconductors are a layer of *silicon*. Many solar cells are connected together into larger arrays to collect more power. The more solar cells there are, the more "***watts***" of energy they collect. Solar cells are not mechanical. They take no energy to run and no water or cooling to change the sunlight into electricity. They make no waste. This is a clean and renewable energy.

The only problem with solar power is that though the sun shines all the time, it doesn't shine everywhere on the planet at one time. Also some places have more cloud cover that blocks sunlight. The best place for solar power is a place where there are few clouds, like a desert. There must also be some room for solar collectors to lie out and take in the sunshine. In the United States, the southwestern part of the country has the sunniest climate for solar collection, but homes everywhere can benefit from some solar collection. Even just big, south-facing windows can bring solar heat into a home. This is called "***passive solar***" collection.

The other problem with solar power is that you need a big area facing the sun to collect it. On a single home the collection area can be on a rooftop facing the sun, but what about a tall building with many apartments or a whole city? It takes space to collect solar power. It is hard for big power companies to collect and sell solar power because sunlight collection takes a lot of space. There were only 14 known large, solar electric generating units working in the United States in 2004, all of them in California and Arizona.

The other limit to solar science at this time is that scientists have only worked out how to make about 25% of the sunlight collected into power. Plus the silicon semiconductors in solar cells are very stiff and hard, so can't be used for a lot of things that aren't flat. New plastic semiconductors are much more flexible and easier to make, but they only change 10% of the sunlight into power. Solar science still has a long way to go to be the endless, clean, free power we hope it will be -- but it's getting there!

Solar Power Read and React

1. Name two reasons why making energy from the sun good for the environment:

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2. Name three problems with solar energy:

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3. Why can't a big power company make and sell enough solar power for everyone?

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4. Explain the difference between collecting solar energy though a solar panel or just through a big south-facing window?

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