

Getting to Know: Solar and Wind Energy

When we think about alternative energy sources, solar power is usually one of the first to come to mind. Solar power farms rely on giant solar cells that can generate large amounts of electricity by collecting the Sun's rays.

We also use solar energy on a smaller scale to run devices we use every day. In math class, for example, you may be using a pocket calculator that relies on solar power. Many roadside devices such as electric signs also rely on solar power.

As world fossil fuel supplies decline, humans are looking more to solar and other alternative energy sources for electricity. In the future, it is likely that you will see solar power become increasingly important in your everyday life.

What is solar energy?

Solar energy involves transforming sunlight into usable energy. There are two types of solar collection. *Passive solar collection* converts the light energy of the Sun into heat. *Active solar collection* converts sunlight directly into electricity. A solar calculator uses active solar collection.



Many pocket calculators use solar cells to provide electricity.



Misconception 1: *Solar energy is a nice idea, but it can't produce enough electricity to meet our needs.*

In fact, Earth receives enough solar radiation every day to more than meet the energy demands of humans. Currently, we just do not have enough facilities to harness and convert solar energy into electricity. This can change as we make solar collection devices less expensive and more efficient.

What are the advantages and disadvantages of solar energy?

Solar energy is environmentally clean, and there is a limitless supply of sunlight. It is also very useful for small devices such as calculators. However, to generate enough electricity to supply buildings and towns, solar panels need to be very large. They take up a lot of space and are often very costly to install.



Misconception 2: Solar and wind energy are too expensive to be worth the cost.

Although the solar panels and wind turbines are expensive up front, in the end they are cost-effective for the amount of electricity they can produce. That means that, over time, using wind and solar energy to produce electricity will save more money than was spent on the original investment.

Another problem with solar energy is that the amount of electricity generated by solar cells can change from day to day. These cells are affected by the time of day, the season, and even daily weather. For example, solar cells produce more electricity on sunny days than on cloudy ones.

How does wind energy work?

Wind is caused by the uneven heating of Earth by the Sun. Wind power captures the movement of the air through the use of large wind turbines. Energy from moving wind causes the turbines to spin. This movement generates electricity.



Misconception 3: I always thought wind was caused by clouds. Is that true?

Wind is caused by the uneven heating of Earth's surface by the Sun. It is not caused by clouds. Clouds may appear when it is windy as a result of other factors such as humidity and temperature.

What are the advantages and disadvantages of wind energy?

Wind energy has its own advantages and disadvantages. Like solar energy, wind energy is environmentally clean and does not produce any pollution. Wind is also a limitless source of energy.

There are some drawbacks to wind power. For example, the turbines must be very large to capture enough wind to generate electricity. This is costly. Also, the turbines are highly visible, which some people don't like. Many people also worry that the large wind turbines will harm birds, although newer designs have reduced the impact on bird populations.

Another problem is that wind turbines are only useful in places that experience a lot of wind, because they only turn if the wind is blowing. All of these drawbacks need to be considered when comparing wind power with other energy sources.

As you learn more about different sources of energy, be alert for the advantages and disadvantages of each.



Wind farms have large turbines that capture the movement of the wind for the purpose of generating electricity.