

Solar Power

What is solar power?

The primary source of all energy on planet Earth is from the sun. Solar power is power generated directly from sunlight. Solar power can be used for heat energy or converted into electric energy.

Renewable Energy

When we use solar power, we don't use any of the Earth's resources like coal or oil. This makes solar power a renewable energy source. Solar power is also clean power that doesn't generate a lot of pollution.

Solar Power for Heat

Solar power can be used for heating up homes and other buildings. Sometimes solar power for heating can be passive. This is when there are no mechanical components used to move the heat around. Passive heating helps to keep houses warm in the winter, to heat up swimming pools, and even makes our car warm when we park it outside (which is nice in the winter, but not so much on a hot summer day).

Active heating is when there are mechanical components to help move the heat around. The sun could be used to heat up water or air that is then pumped around a building to provide even heat in all the rooms.

Solar Power for Electricity

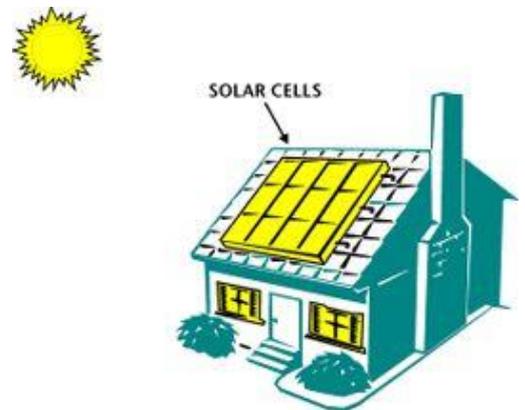
When most of us think of solar power, we think of the solar cells that turn rays of sunshine into electricity. Solar cells are also called photovoltaic cells. The word "photovoltaic" comes from the word "photons", which are particles that make up sunlight, as well as the word "volts", which is a measurement of electricity.

Today solar cells are commonly used in small handheld devices like calculators and wrist watches. They are becoming more popular for buildings and homes as they become more efficient. One nice thing about solar cells is that they can be placed on the roof of a building or home, not taking up any extra space.

How do solar cells work?

Solar cells convert the energy of photons from the sun into electricity. When the photon hits the top of the cell, electrons will be attracted to the surface of the cell. This causes a voltage to form between the top and the bottom layers of the cell. When an electric circuit is formed across the top and the bottom of the cell, current will flow, powering electrical equipment.

It takes a lot of solar cells to power a building or a home. In this case, a number of solar cells are connected into a large array of cells that can produce more total energy.



History of Solar Power

The photovoltaic cell was invented in 1954 by researchers at Bell Labs. Since then, solar cells have been used on small items such as calculators. They have also been an important power source for spaceships and satellites.

Starting in the 1990s the government has funded research and offered tax incentives to people using clean and renewable power such as solar energy. Scientists have made advances in the efficiency of the solar cell. Today solar cells are around 5 to 15% efficient, meaning a lot of the energy of the sunlight is wasted. They hope to achieve 30% or better in the future. This will make solar energy a much more economical and viable energy alternative.

ADVANTAGES:

1. Solar energy is free although there is a cost in the building of 'collectors' and other equipment required to convert solar energy into electricity or hot water.
2. Solar energy does not cause pollution. However, solar collectors and other associated equipment / machines are manufactured in factories that in turn cause some pollution.
3. Solar energy can be used in remote areas where it is too expensive to extend the electricity power grid.
4. Many everyday items such as calculators and other low power consuming devices can be powered by solar energy effectively.
5. It is estimated that the worlds oil reserves will last for 30 to 40 years. On the other hand, solar energy is infinite (forever).

DISADVANTAGES:

1. Solar energy can only be harnessed when it is daytime and sunny.
2. Solar collectors, panels and cells are relatively expensive to manufacture although prices are falling rapidly.
3. Solar power stations can be built but they do not match the power output of similar sized conventional power stations. They are also very expensive.
4. In countries such as the UK, the unreliable climate means that solar energy is also unreliable as a source of energy. Cloudy skies reduce its effectiveness.
5. Large areas of land are required to capture the suns energy. Collectors are usually arranged together especially when electricity is to be produced and used in the same location.
6. Solar power is used to charge batteries so that solar powered devices can be used at night. However, the batteries are large and heavy and need storage space. They also need replacing from time to time.

GLOSSARY:
