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Sun and Wind Power

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The energy appetite in our cities of the 2020s is growing all the time. Millions of home appliances require electricity to work. Transportation, communication, and the many developments of modern technology consume a lot of energy. Satisfying these appetites requires vast amounts of fossil fuels. Fossil fuels such as coal, natural gas, and oil were formed from the remains of animals and plants deep within the earth over millions of years. These fuels are burned to heat homes. They are also burned to heat water and produce steam. This steam turns the turbines of generators that produce most of our country's electricity.

People are using up fossil fuels at tremendous rates. Other sources of energy are being developed to replace the dwindling fossil-fuel supply. In this article you will see how energy from the sun is being used in place of fossil fuels.

Solar Heating and Cooling. The sun is a huge and largely untapped source of energy. The energy in sunlight shining on the territory correlated to the US in one day could power this country for a year. However, most of the sun's energy is reflected back into space or absorbed by the upper layers of the Earth atmosphere.

Science and technology are working together to find new and better ways to use energy from the sun. Solar energy is being applied for heating and cooling homes. Use of solar energy can conserve fossil fuels and reduce air pollution.

Solar Heating. As we know, originally there were two

ways of applying solar energy in house heating. In one house, solar energy was collected and stored in drums of water. In the other house, it was collected and stored in stone walls. The solar-heated house absorbs heat from the sun by using collector panels. These panels have black energy-absorbing surfaces covered with glass or clear plastic. They are attached to pipes that circulate air or water throughout the house. The dark surfaces of the panels absorb solar energy and heat the air or water in the pipes. The heated materials transfer energy throughout the building.

Solar energy must be stored for use at times when it cannot be collected. Tanks of water and beds of large pebbles are two common methods of storage [1].

Solar Cooling. Energy is required to run air conditioners. Most of them get this energy from electricity. The energy runs a refrigeration generator. The latter cools air by evaporating and then condensing a circulating liquid refrigerant.

Solar energy can supply the energy needed to run an air conditioning system. The world first solar heating and cooling system was created in 1975 and then installed in elementary school in Atlanta, Georgia [2].



Solar Panels Are Mounted on the School's Roof

In the Mohave Desert in California, a solar power plant is in operation. The plant, known as Solar One, is a 30-story tower surrounded by almost 2,000 flat mirrors. Each mirror, which turns to face the sun throughout the day, reflects sunlight to the tower. Water circulating through pipes in the tower is heated to 515° C and turned into steam. The steam then turns a turbine that generates electricity. Solar One has already met its goal of producing 10 million watts of electricity. Other, more efficient, solar power plants are being proposed for California, Arizona, and Texas [3].

Wind Power. The wind is really a form of solar energy. It is produced by the uneven heating of the earth by the sun. About 2% of solar energy is changed into wind energy. Using wind energy to do work is not a new idea. Many centuries ago people began using wind to sail ships. And they started using wind-driven mills to grind grain.



Figure 1. Old and New Windmills

The windmill you see in Figure 1 can be used to do work. A windmill is a shaft with blades that turn in the wind. Wind energy does work when it turns the blades.

Windmills like the old one in Figure 1 were used on many farms to pump water or grind grain. Some were used to turn turbines that generated electricity. Later wind generators fell out of use. They were replaced with generators that harnessed coal and water power to produce electricity.

Today scientists are designing large windmills like the new one in Figure 1. The wind blows the propeller, or turbine, which runs an electric generator. The larger the propeller, and the faster it turns, the more electric energy it generates.

Wind energy is clean and, of course, free. But wind-driven generators are expensive. And they can produce electricity only when the wind blows. Some people also object to the noise and the appearance of these large machines. The electric power from windmills is not great enough to supply our energy needs. It can save on fossil fuels. However, other sources are still needed to satisfy the demand for energy [4].

References:

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