

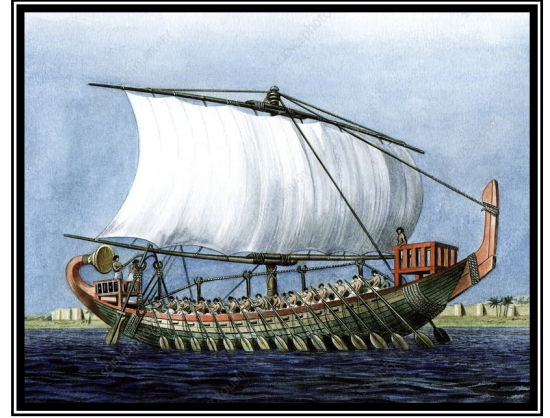
Wondrous Wind Power...

“Oh, the work that can be done by harnessing and converting energy from one form to another.”

Using wind as a power source is not new. People used wind energy to propel boats along the Nile River as early as 5,000 BC. And by 200 BC, simple wind-powered water pumps were used in China, and windmills with woven-reed blades were grinding grain in Persia and the Middle East.

American colonists used windmills to grind grain, to pump water, and to cut wood at sawmills. Homesteaders and ranchers installed thousands of wind pumps as they settled the western United States. In the late 1800s and early 1900s, small wind-electric generators (wind turbines) were also widely used. However, the number of wind pumps and wind turbines declined as rural electrification programs in the 1930's extended power lines to most farms and ranches across the country. A power that was generated by the burning of fossil fuels (oil).

The oil shortages of the 1970s changed the energy environment for the United States and the world. The oil shortages created an interest in developing ways to use alternative energy sources, such as wind energy, to generate electricity. By the 1990s and 2000s, the U.S. federal government established incentives to use renewable energy sources in response to a renewed concern for the environment.



But what is the science behind wind power? *Kinetic energy to mechanical energy to electrical energy:*

Kinetic energy is the energy that an object has because of its motion. This energy can be converted into other kinds, such as gravitational or electric potential energy, which is the energy that an object has because of its position in a gravitational or electric field.

Mechanical energy is the sum of kinetic and potential energy in an object that is used to do work. In other words, it is energy in an object due to its motion or position, or both.

Potential energy is defined as mechanical energy, stored energy, or energy caused by its position. The energy that a ball has when perched at a top of a steep hill while it is about to roll down is an example of potential energy.

Electrical energy made available by the flow of electric charge through a conductor in a generator which converts mechanical energy to electrical energy.

Wind turbines use blades to collect the wind's kinetic energy. Wind flows over the blades creating lift (similar to the effect on airplane wings), which causes the blades to turn (mechanical energy). The blades are connected to a drive shaft that turns an electric generator, which produces (generates) electricity energy or mechanically pulls water from the earth.

The size of wind turbines varies widely. The length of the blades is the biggest factor in determining the amount of energy a wind turbine can generate.

Now let's explore some simple machines put in motion with the power of the wind. (See the DIY instructions)

