Wind

Wind is moving air. We can use the energy in wind to do work. Early Egyptians used the wind to sail ships on the Nile River. People still use wind to move sailboats. In the Netherlands, people used windmills to grind wheat. American colonists used windmills to grind corn, pump water, and run sawmills. Today, we use wind to make electricity.

The Sun Makes the Wind Blow

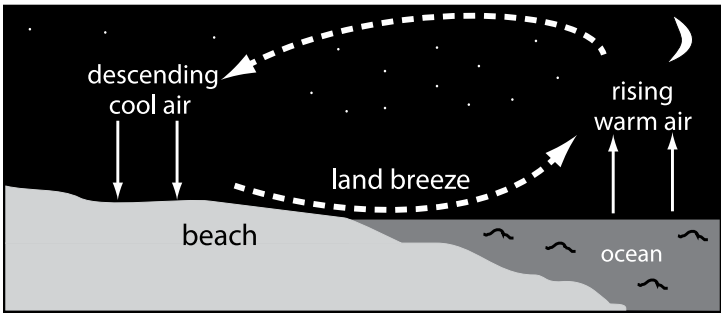
The energy in wind comes from the sun. When the sun shines, some of its light reaches the Earth's surface. The Earth near the Equator receives more of the sun's energy than the North and South Poles.

Some surfaces of the Earth absorb more solar energy than others. Some surfaces reflect more of the sun's rays back into the air. Light-colored surfaces and water reflect more sunlight than dark surfaces. Sand, snow, oceans, and ice reflect a lot of sunlight. Dark forests and cities with lots of buildings, bricks, and streets absorb a lot of sunlight. Different kinds of surfaces heat up at different speeds.

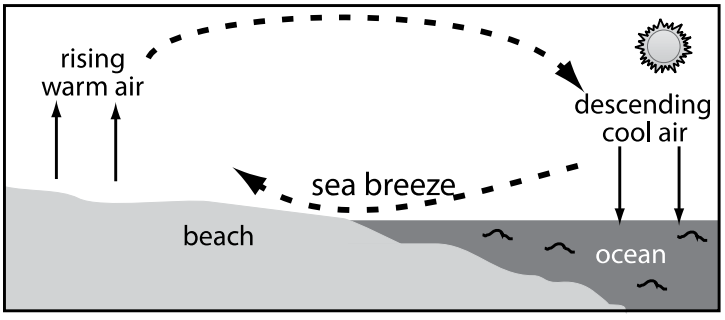
When the Earth's surface absorbs the sun's energy, it turns the light into heat. This heat on the Earth's surface warms the air above it. The air over the equator gets warmer than the surface air near the poles. The air over the desert gets warmer than the air in the mountains.

The air over the land usually gets warmer than the air over the water. As air warms, it expands. The warm air over the land becomes less dense than the cooler air and rises into the atmosphere. Cooler, denser air nearby flows in to take its place. This moving air is what we call wind. It is caused by the uneven heating of the Earth's surface.

Land Breeze



Sea Breeze



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Wind Energy Is Renewable

As long as the sun shines, there will be winds on the Earth. We will never run out of wind energy. It is a renewable energy source. It is also free since no one can own the sun or the air.

We Can Capture the Wind

Some places have more wind than others. Shallow water along coastlines or offshore in deep water are usually quite windy. Flat land and mountain passes are good places to catch the wind, too.

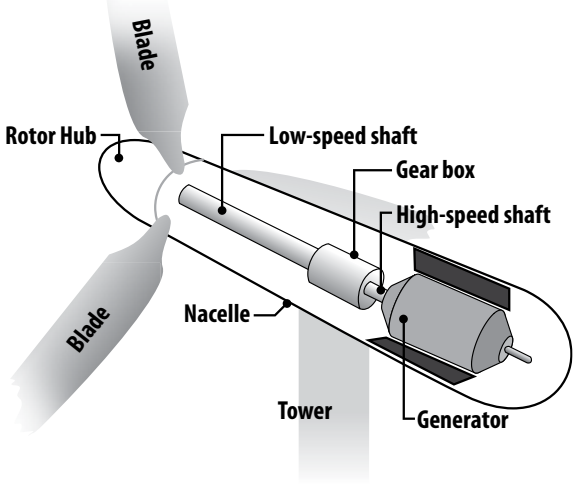
Today, we use big **wind turbines** to capture the wind. Sometimes, there are hundreds of wind turbines in one place. This is called a **wind farm**. Wind turbines are very tall—if you laid a wind turbine down, it would stretch longer than one football field.

Wind Can Make Electricity

When the wind blows, it pushes against the blades of the wind turbines. The blades spin around. They turn a **generator** to make electricity. The wind turbines don't run all the time, though. Sometimes the wind doesn't blow at all and sometimes the wind blows too hard. Most wind turbines run between 65 and 90 percent of the time.

Today, wind energy makes about 10 percent of the electricity we use in the United States. Most of the big wind farms are in Texas, Iowa, Oklahoma, Kansas, and Illinois. Many more are popping up all over the country and the world, on land and offshore.

Wind Turbine Diagram



Wind Is Clean Energy

Wind is a clean energy source. Wind turbines don't burn fuel, so they don't pollute the air. Wind is a safe renewable energy source and is free.

Older wind turbines can make a lot of noise as they spin, but new ones do not make as much noise.

One wind turbine usually doesn't make enough electricity by itself for what we need in most areas. Most wind farms have many wind turbines working together. Wind farms can take up a lot of land. Most of the land they are on can still be farmed or used to graze animals. Wind turbines can also be placed in the ocean without disrupting fishing or navigation.