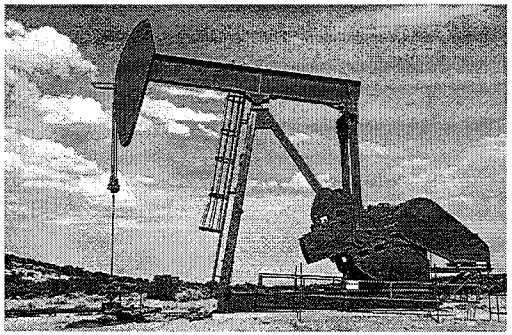
FORMATION OF RESOURCES

How Are Resources Formed?

The formation of resources influences where resources are located. By understanding the conditions needed to form a resources, it is can be possible to predict where resources are located or available.

Ways Some Resources Are Formed

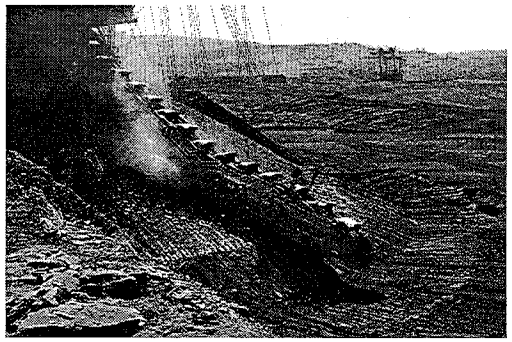


Oil

Oil was formed from the remains of animals and plants (diatoms) that lived millions of years ago in a marine (water) environment before the dinosaurs. Over millions of years, the remains of these animals and plants were covered by layers of sand and silt. Heat and pressure from these layers helped the remains turn into what we today call crude oil. The word "petroleum" means "rock oil" or "oil from the earth."

Coal

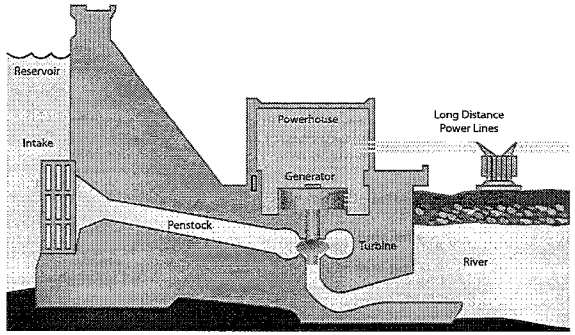
Coal is a combustible black or brownish-black sedimentary rock composed mostly of carbon and hydrocarbons. It is the most abundant fossil fuel produced in the United States.



An open-pit coal mine in the Czech Republic.

Coal is a non-renewable energy source because it takes millions of years to create. The energy in coal comes from the energy stored by plants that lived hundreds of millions of years ago, when the Earth was partly covered with swampy forests.

For millions of years, a layer of dead plants at the bottom of the swamps was covered by layers of water and dirt, trapping the energy of the dead plants. The heat and pressure from the top layers helped the plant remains turn into what we today call coal.



Hydroelectric dam. Source: Tennessee Valley Authority.

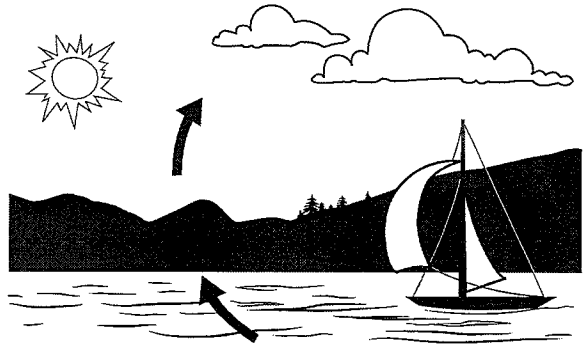
Hydropower

The amount of available energy in moving water is determined by its flow or fall. Swiftly flowing water in a big river, like the Columbia River that forms the border between Oregon and Washington, carries a great deal of energy in its flow. Water descending rapidly from a very high point, like Niagara Falls in New York, also has lots of energy in its flow.

In either instance, the water flows through a pipe, or *penstock*, then pushes against and turns blades in a turbine to spin a generator to produce electricity. In a run-of-the-river system, the force of the current applies the needed pressure, while in a storage system, water is accumulated in reservoirs created by dams, then released as needed to generate electricity.

Wind

Wind is simply air in motion. It is caused by the uneven heating of the Earth's surface by the Sun. Because the Earth's surface is made of very different types of land and water, it absorbs the Sun's heat at different rates. One example of this uneven heating can be found in the daily wind cycle.



Based on an image from the National Energy Education Development Project.

During the day, the air above the land heats up more quickly than the air over water. The warm air over the land expands and rises, and the heavier, cooler air rushes in to take its place, creating wind. At night, the winds are reversed because the air cools more rapidly over land than over water.

In the same way, the atmospheric winds that circle the Earth are created because the land near the Earth's equator is heated more by the sun than the land near the North and South Poles.