

## Getting to Know: Hydroelectric and Geothermal Energy

The Hoover Dam is one of the largest hydroelectric power plants in the United States today. The dam is located on the Colorado River between Nevada and Arizona. It has 17 turbines and generates approximately 4 billion kilowatt-hours of energy each year.

The Hoover Dam is one example of an energy source known as *hydroelectric power* in which the energy of moving water is harnessed for the purpose of producing electrical energy. Hydroelectric power is one alternative to burning fossil fuels. It's clean and does not produce pollution. However, hydroelectric power does include some drawbacks of its own. The pros and cons must be considered as we decide how to meet our energy needs in the future.



The Hoover Dam is one of the largest sources of hydroelectric power.

### How does hydroelectric power work?

Hydroelectric power plants use moving water to generate electricity. These power plants require a constant supply of moving water. Water flows through the plant and spins *turbines*, giving them kinetic energy. The turbines spin generators, which convert the kinetic energy to electrical energy. The electrical energy is carried to homes and businesses through wires. Once the water has passed through the plant, it continues on its way down the river.



Hydroelectric power plants use the natural movement of water to generate electricity.

Hydroelectric power plants are usually made by damming rivers. The dams hold the water back, forcing it to flow through the plant's pipes. On the other side, the water is released back into the river. One benefit of these plants is that they are environmentally clean and do not generate much pollution.



### **Misconception 1:** *How can we run out of energy while we have this power source?*

Hydroelectric energy converts the kinetic power of moving water into electric energy. However, it is not a perfect solution. It would not be possible to meet the all of the world's energy needs using only this energy source.

There are some drawbacks to hydroelectric power plants. Dams can damage the river habitat and kill local wildlife. They can also change the appearance of the river. These things must be considered when constructing a new hydroelectric plant.

### ***How does geothermal power work?***

*Geothermal* power taps Earth's internal heat to produce electricity. These power plants drill into the Earth's surface and extract steam or hot water. The steam turns turbines to produce electricity. Once the steam cools and becomes liquid, the water is returned to the Earth's crust.

Geothermal energy has several advantages. It is environmentally clean, because it uses nothing but water and the Earth's own heat. There is also an endless supply of available geothermal energy.



Geothermal power relies on heat in Earth's crust.

### ***Are there any drawbacks associated with geothermal energy?***

One drawback is that this kind of power cannot be found everywhere. Geothermal power plants rely on geothermal reservoirs. These form when hot rock in the Earth's crust comes into contact with underground water. These reservoirs are only found in certain parts of the world. The best places to find geothermal reservoirs are areas around plate boundaries or areas with a lot of volcanic or seismic activity.



#### **Misconception 2:** *I thought that water beneath Earth's surface is cold.*

Although many areas of Earth's crust are cold, there are some areas of Earth's crust that are very hot. Water in the crust can reach extremely high temperatures. This geothermal energy can then be transformed into electricity.