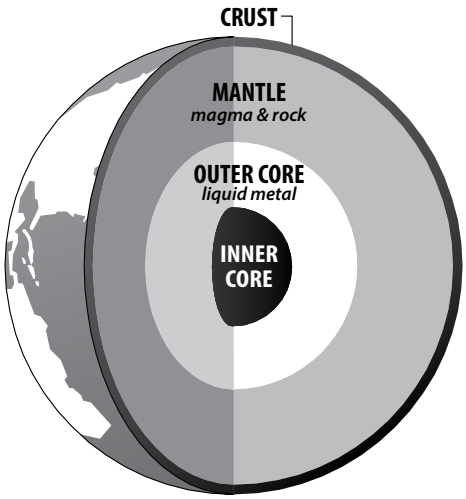
Geothermal

Geothermal comes from the Greek words *geo* (earth) and *therme* (heat). Geothermal energy is heat inside the Earth. The inside of the Earth is very hot. Sometimes this heat comes near the surface. We can use this heat to warm our houses. We can make electricity with it. Geothermal provides the U.S. with less than one percent of our energy.

The Earth Is Not Solid

The Earth is made of parts or layers, like a hard-boiled egg. At the center is a **core** of iron. Around that is an outer core of iron and rock so hot the rock is melted. This liquid rock is called **magma**. The middle layer is a mixture of rock and magma called the **mantle**. The shell of the Earth—with the oceans and mountains—is called the **crust**.



In some places, magma comes close to the Earth's surface. It heats the water underground. We can use this heated water. We dig **wells** and pump the hot water and steam out of the ground.

Geothermal Is Renewable

The hot water we use will be replaced by rain. The heat inside the Earth will always be there. More heat is made every day in the Earth's core. We won't run out of geothermal energy. It is a **renewable** energy source.

Where Is Geothermal Energy?

Geothermal energy is everywhere under the ground, but sometimes it is hard to reach. In most places, the crust is miles thick. Magma is near the surface in only a few places.

Earthquakes and volcanoes are signs that magma is near the surface. When magma reaches the surface it is called **lava**. Most of the geothermal energy in the United States is found in western states and in Hawaii.

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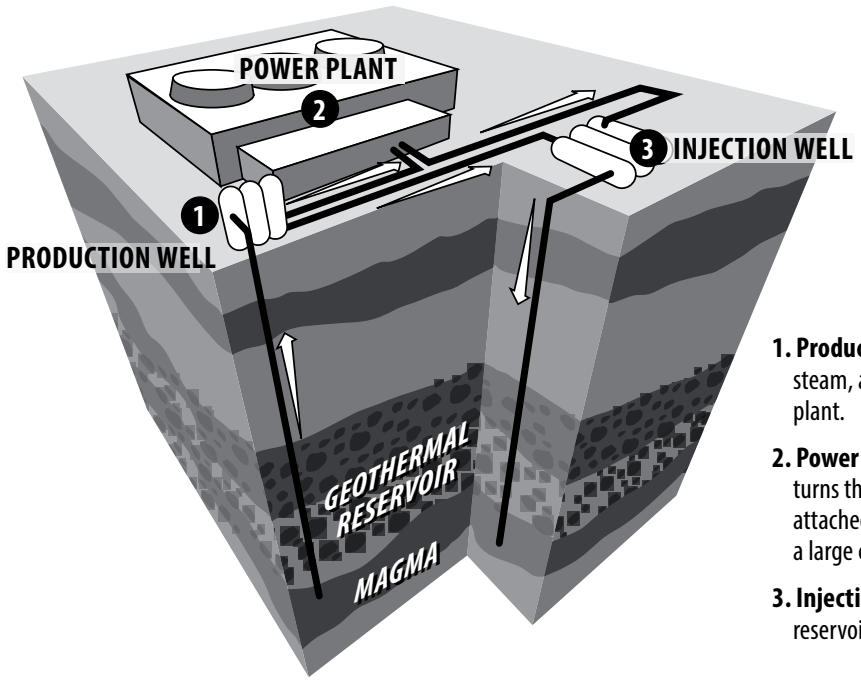
Geothermal Power Plant



1. **Production Well:** Geothermal fluids, such as hot water and steam, are brought to the surface and piped into the power plant.
2. **Power Plant:** Inside the power plant, the geothermal fluid turns the turbine blades, which spin a shaft. This shaft is attached to the generator. The generator spins magnets inside a large coil of wire to generate electricity.
3. **Injection Well:** Used geothermal fluids are returned to the reservoir.

We Use Geothermal Energy

People have used geothermal energy for thousands of years. In some places, there are pools of water that are always hot. They are warmed by underground springs. These **hot springs** have often been used for bathing. Many people believe these springs have healing powers. Most people in Iceland use hot water from geothermal wells to heat their homes.

Electricity

Power plants use steam from geothermal wells to make **electricity**. The steam is used to spin turbines. The **turbines** spin magnets in coils of copper wire to make electricity.

The power plants are built close to the wells. The steam is pumped straight from the wells to the power plants. The U.S. gets less than 1 percent of its electricity from geothermal power plants.

Geothermal Energy Is Clean Energy

Geothermal energy is clean energy. No fuel is burned, so there is no air **pollution**. The steam is turned into water and put back into the Earth. And geothermal energy is cheap—once a new power plant is built, it can make electricity for less cost than a **coal** or **natural gas** plant.