

Exploring Geothermal: What is geothermal energy?

Geothermal energy is the heat (thermal energy) that is generated and stored in the Earth.

Where does the heat come from?

The Earth is composed of several layers, with each of these layers becoming hotter with depth, or as you move toward the centre of the Earth. They consist of the solid inner core, the liquid outer core, the mantle (includes partially melted rock known as magma) and the outer rigid crust. Heat is continuously produced in the earth by the slow decay of naturally occurring radioactive elements that are mainly found in rocks of the Earth's crust.

- 83% of the heat is generated by natural radioactive decay of uranium, thorium and potassium in the crust.
- 17% of the heat comes from mantle cooling.

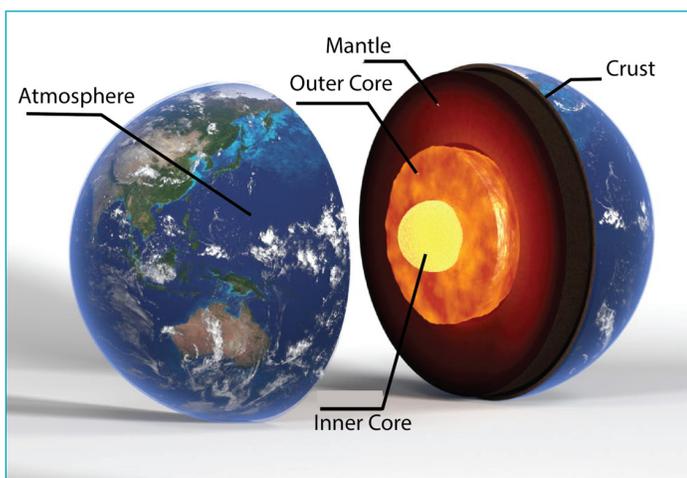


Image: [Toronto Star](#)

Where on Earth do we find geothermal energy?

Because the temperature of the Earth increases with depth, geothermal energy is found everywhere deep in the ground. The rate of change of temperature with depth is known as the **geothermal gradient**. The average geothermal gradient is 25°C/km, but locally, can be much higher depending on the geological setting of an area. In areas with an unusually high geothermal gradient, geothermal energy development may be economical.

How does geothermal heat get closer to the surface?

Most geothermal heat is generated several kilometres below the surface. The Earth's crust is actually broken into several large pieces known as tectonic plates. These plates are in constant motion – drifting apart or coming together at a very slow rate of just a few centimetres per year. The boundaries of major plates may be highly active with volcanoes and earthquakes. The most famous of these is known as the “Pacific Ring of Fire” which rims the Pacific Ocean. In these zones, heat is brought to the surface by volcanoes, or via large cracks in the Earth's crust (known as faults). When this near-surface heat is transferred to water, a usable form of geothermal energy is created.

FOR MORE INFORMATION, PLEASE CONTACT:

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