



Geothermal Energy

Geothermal energy technology captures heat energy stored in the Earth's crust and converts it into electric or heat energy. Geothermal resources can be tapped at multiple depths, ranging from low-temperatures in the shallow ground to hot rock and water found several miles below the surface of the Earth, to molten rock (magma) found even deeper. Hot water and steam can be captured to drive a turbine and generate electricity. However, the most common application of geothermal energy is found in shallow heat exchange pumps, referred to as **ground-source heat pumps**, that transfer energy from the ground and use it to provide heating, cooling, and/or hot water services.

What is the status of geothermal energy in Massachusetts?

There are currently no [Renewable Portfolio Standard](#)-qualified geothermal-based electrical generation units in Massachusetts. However, small-scale residential and commercial applications are common.

Halibut Point State Park in Rockport, MA, has a ground-source heat pump installed that provides 303 MMBTU of heating and cooling energy per year (equivalent to 62 MWh per year).

How can I develop geothermal resources in my community?

Although high-temperature geothermal electric systems are costly and difficult to install, ground-source heat pumps can easily replace conventional furnaces and boilers to offset heating and cooling energy consumption from fossil fuel sources.

Although they are more expensive upfront than conventional systems, higher efficiencies associated with ground-source heat pumps generally lead to a favorable payback period. Massachusetts also offers a sales tax exemption for geothermal heat pump equipment.

The pipes for a ground-source heat pump system can be laid either horizontally (in trenches) or vertically (in boreholes drilled straight down into the earth) depending on the site area available to your facility. These should only be installed by licensed professionals.