HAWAIʻI STATE ENERGY OFFICE

What is Geothermal Energy?

Geothermal energy is the Earth's heat, which can be used to make electricity.

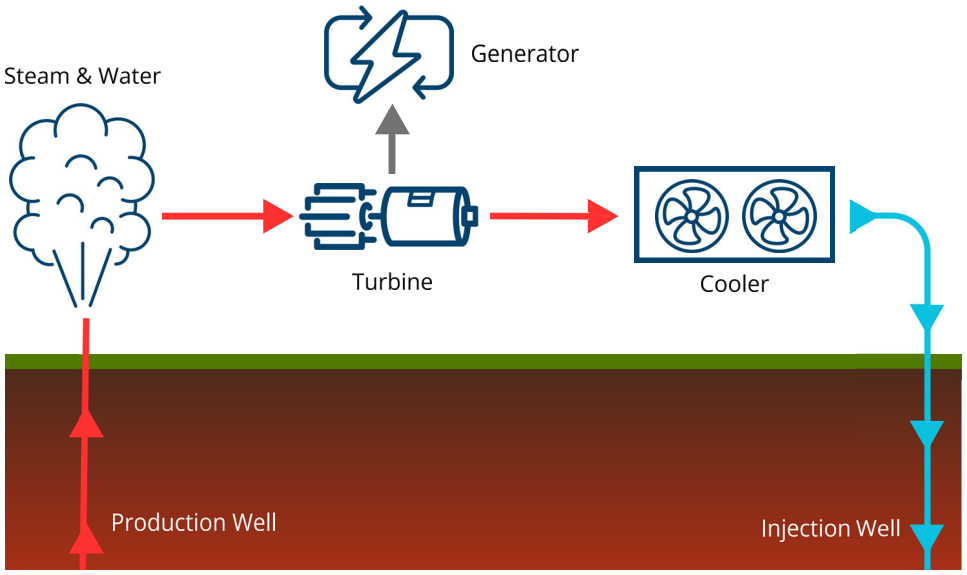
Magma heats the rock and water around it, creating an underground pool of hot water called a geothermal reservoir.

How Are Geothermal Resources Used?

Geothermal energy can be turned into electricity using hydrothermal technology, which is the most common technology used today, both in Hawai'i and around the world.

Hydrothermal technology pulls water or steam up from geothermal reservoirs and uses it to spin a turbine, which generates electricity. After it is used, the water is returned to the underground reservoir to maintain the resource.

Hydrothermal technology can be used for flash steam, dry steam, and binary cycle power plants.



Learn more about different geothermal systems and how each type of geothermal power plant works.

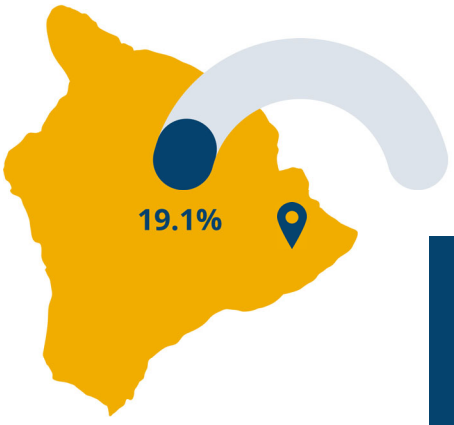
How Else Can We Use Geothermal Energy?

Geothermal energy can be used for more than making electricity. Steam or heat from the ground can also be used directly for things like...

Heating and Cooling

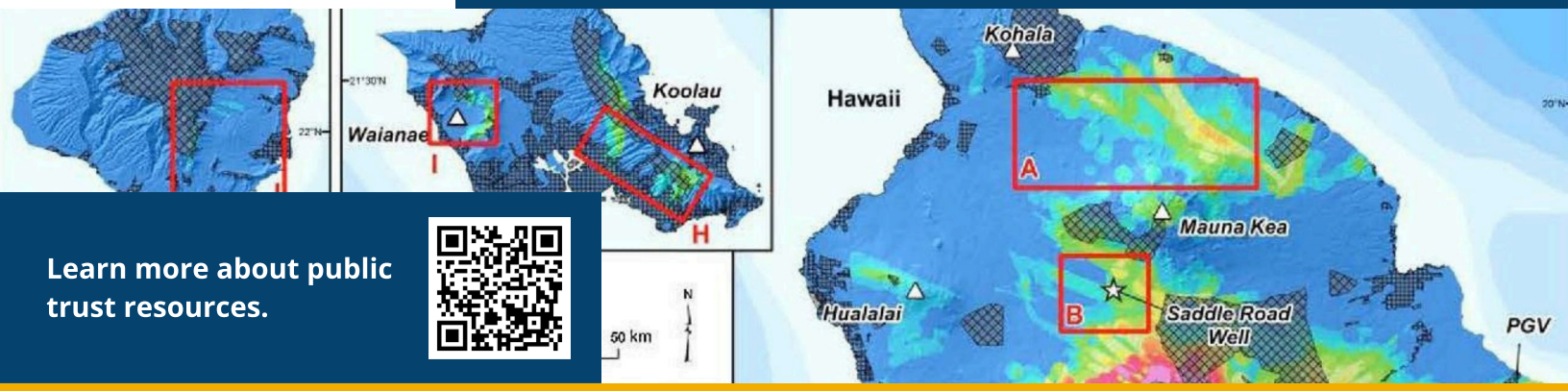
Greenhouses and Drying Crops

Pasteurization



19.1% of Hawai'i Island's electricity came from geothermal energy in 2024. Regions with volcanic activity, like Hawai'i Island, have the highest geothermal potential, but it can be used anywhere with enough underground heat. There is potential for heat on all the major Hawaiian Islands.

Geothermal is considered a public trust resource, and it is appropriate for the State to lead efforts to better understand and characterize Hawai'i's geothermal resources.



Learn more about public trust resources.

Geothermal Energy: Key Takeaways

Renewable & Firm: The Earth constantly produces heat and always will, which allows geothermal power plants to produce reliable, consistent electricity that is available 24/7.

Better for the Environment: Unlike fossil fuels, newer geothermal power plants only release water vapor and trace amounts of hydrogen sulfide when properly managed.

Expensive to Find: Finding geothermal resources can come at a high cost, but production costs are low when spread out over a facility's lifetime. Properly maintained plants can last 50 years or more, making them some of the lowest-cost options for electricity.

Compact: Compared to other renewable energy technologies, geothermal power plants use less land to produce the same amount of energy.

Research is Needed: Hawai'i does not currently have the data needed to understand what geothermal resources exist in the state and where. Subsurface studies are needed to truly understand the potential for geothermal and which geothermal technologies would work in Hawai'i.

Learn more about geothermal energy at www.energy.hawaii.gov

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