



U.S. Department of Energy

Energy Efficiency and Renewable Energy*Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable*

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Geothermal



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Geothermal Topics

Geothermal energy technologies use the heat of the earth for direct-use applications, geothermal heat pumps, and electrical power production. Research in all areas of geothermal development is helping to lower costs and expand its use. In the United States, most geothermal resources are concentrated in the West, but geothermal heat pumps can be used nearly anywhere.

[More basic information about geothermal energy is also available.](#)

Technologies Exploration

Geological, geochemical, and geophysical techniques are used to locate geothermal resources.

Drilling

Drilling for geothermal resources has been adapted from the oil industry. Improved drill bits, slimhole drilling, advanced instruments, and other drilling technologies are under development.

Direct Use

Geothermal hot water near the Earth's surface can be used directly for heating buildings and as a heat supply for a variety of commercial and industrial uses. Geothermal direct use is particularly favored for greenhouses and aquaculture.

Geothermal Heat Pumps

Geothermal heat pumps, or ground-source heat pumps, use the relatively constant temperature of soil or surface water as a heat source and sink for a heat pump, which provides heating and cooling for buildings.

Electricity Production

Underground reservoirs of hot water or steam, heated by an upwelling of magma, can be tapped for electrical power production.

Advanced Technologies

Advanced technologies will help manage geothermal

Geothermal News

- [Two New Geothermal Power Plants Slate Northern Nevada](#)
August 09, 2006
- [DOE to Guarantee Billion in Loans for Clean Energy Projects](#)
August 07, 2006
- [Geothermal Power Plants Planned for Idaho, Oregon, and California](#)
August 02, 2006

resources for maximum power production, improve plant operating efficiencies, and develop new resources such as hot dry rock, geopressured brines, and magma.

Issues

Environment

Geothermal technologies release little or no air emissions. Geothermal power production produces much lower air emissions than conventional energy technologies.

Resources

In the United States, geothermal resources are concentrated in the West, although low-temperature resources can also be found in the rest of the country. Geothermal heat pumps can be used nearly anywhere.

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