

Pumped Up About Geothermal

Homeowners Like its Eco-Friendly Cost Savings

by Jim Motavalli

It's an uncertain time for home-based geothermal heating and cooling, which has been increasing for years. The good news is that the cost of the technology is down and its efficiency is up. Yet a helpful 30 percent federal income tax credit inaugurated in 2009 disappeared in 2017 and may not get renewed anytime soon, even though H.R. 1090, a bill aimed at restoring the credit, has had strong support in Congress, led by New York Republican Congressman Tom Reed.

While ideal spots for tapping into Earth's energy are where tectonic plates meet and move, such as along the U.S. West Coast and in Alaska, it's a misperception that it's only possible in corresponding states. Anyone in the U.S. can use a geothermal heat pump, which works by accessing the constant 50-degree temperature just below the Earth's surface.

Iceland is equipped to get 50 percent of its energy from geothermal. Other countries now accessing it for at least 15 percent of their energy include Costa Rica, El Salvador, Kenya and the Philippines.

How It Works

The systems work by moving water through plastic pipes sunk into the ground, and using a heat exchanger to warm or cool refrigerant that then circulates throughout the house. Operating like a conventional heat pump, it



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needs less than half as much energy—just one kilowatt-hour of electricity—to produce 12,000 BTU (British thermal units, a standard energy measure). Its efficiency is double that of the best air conditioner and 50 percent superior to the best natural gas furnace, according to the U.S. Department of Energy. Planet-friendly geothermal energy emits no pollution and reduces the need for fossil fuels.

Return on Investment

While they can cost \$20,000 to \$25,000 for an average-sized home, the systems are long-lasting; most provide a 10-year or longer warranty, based on having few moving parts that may break. The above-ground compressor and pump have a 20-year life expectancy and the expensive underground piping system should last a lifetime, says Brian Clark Howard, a *National Geographic* editor and co-author of *Geothermal HVAC* [heating, ventilation and air conditioning].

“Once the wells are dug and the loops are in, you’ll probably never have to revisit them.”

According to Ryan Dougherty, chief operating officer of the Geothermal Exchange Organization, which represents manufacturers and installers, a typical home system costs approximately \$24,000 installed, including the ground heat exchanger and all necessary ductwork.

Renewable energy often makes sense without subsidies. Dougherty still sees geothermal as a good deal for homeowners, with a payback period of seven to 10 years.

Dale Binkley of Landenberg, Pennsylvania, installed his home's geothermal heat pump in 2006, before the 30 percent federal tax credit took effect. His out-of-pocket cost was \$23,522, with a small federal credit and modest rebate from the local utility.

Binkley is pleased. “The system is easy to maintain, cost efficient, and works well. It heats and cools better

than I thought it would," he says. Binkley saved \$1,000 on his heating and cooling bill the first year, a savings he continues to enjoy every year.

Added Benefits

"You'll gain outstanding temperature and humidity control, plus a better running, more-efficient HVAC system," Howard says. "Installing geothermal will also increase property values." Institutional customers reap comparable benefits. As a tax-exempt entity, the Cozy Green Library, in Darien, Connecticut, uses geothermal heating and cooling, along with energy-efficient computers, LED light bulbs and storm water biofiltration,

Carefully evaluating options allows homeowners and commercial landlords to make an informed decision about tapping into Earth's free energy.

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WHERE TO LEARN MORE

Geothermal Energy Association
202-454-5261, Geo-Energy.org

Geothermal Exchange Organization, 888-255-4436,
GeoExchange.org

Geothermal HVAC, by Jay Egg and Brian Clark Howard