

# How I Saved Energy, Money Switching to Geothermal

The most difficult expense to budget at our house is the bill for electricity.

When we moved to Oklahoma, we bought a home in the country that depends on electricity for all its energy needs. The house was built in the early '70s - before energy efficiency became a national concern.

Over the years, we replaced air conditioner compressors and household appliances with energy efficient units and made changes to the house that lowered our energy usage, but nothing made a dent in the amount of money we were paying for electricity.

The cost for electricity rose as much as our usage declined.

Last year, we decided to do something that would dramatically lower both our energy usage and our monthly electric bill. We installed a geothermal heating and air-conditioning system.

Geothermal systems use underground energy to heat and cool your home. While the temperature of the air around your house fluctuates with the weather, the temperature underground remains fairly constant.

In Oklahoma, that temperature is about 55 degrees.

Geothermal systems circulate a fluid - at my house it is ordinary water - below ground. Then the fluid circulates to a heat pump that uses the energy at ground temperature to help regulate the temperature of the air that circulates in your house, using less energy from electricity in the process.

Our system also connects to the hot water heater and holds its water temperature steady at 130 degrees. Now, the heating coils on the hot water heater only come on when the tank has been drained during heavy usage.

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Switching to geothermal energy was not cheap. The cost is comparable to the price of a new car. We had to secure a five-year loan to pay for it, but our sticker shock was eased by some strong incentives.

Our electric company gave us a \$3,000 rebate as soon as it was installed, and Congress passed legislation that will permit us to deduct 30 percent of the cost of a new geothermal HVAC from our income taxes.

We also expected some immediate savings on our electric bill to help pay the note. Still, we were told not to expect to break even for six or seven years.

Most of the expense was for drilling two 350-foot deep wells and for the heavy-duty water pumps that circulate the fluid to the heat pump and up and down the wells.

Maintaining this part of the system will consist of replacing the water pumps whenever they wear out. This should be a minor expense every 10 to 15 years.

Maintenance on the rest of the unit should be comparable to what would be expected for an ordinary heating and air system.

Energy usage for the new system during the first six months, compared to our average energy usage for the same six months over the previous 10 years, shows that the geothermal HVAC reduced our energy usage by 63 percent.

Previously we averaged 17,646 kilowatt hours for that half of the year. This year we used 6,496 kilowatt hours.

The amount of money saved fluctuates monthly, in accord with the rise and fall in the price of electricity and with the amount of energy used during peak hours.

Translated into dollars at the current rates, our electric bill has been reduced by an average of \$216 a month - more than half of the amount of the monthly payment for the note to install the unit. Total savings for these mostly winter months was \$1,296.

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If the money we save on electricity remains at this level over the summer months, we can expect to break even on the cost for installing the geothermal unit in another 53 months. One month before the final payment on our five-year note.

After that, for as long as we live in the house, all of the savings on our electric bill belongs to us.

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