

# { Flagstaff's Green Builder }

## Free Heat in a Flagstaff Winter?

By David Carpenter

**D**id you know there is an almost endless supply of free heating energy just below the surface of the earth? In fact, in your backyard, there is typically ten times the amount of energy needed for a typical heating season.

High efficiency geothermal systems use a small amount of energy to capture and move a large amount of free energy and deliver it to a typical home. In a geothermal system, a series of pipes buried beneath the ground circulate a special fluid that transfers heat energy from the moderately temperate ground to the geothermal unit located in the home. Once inside the home the heat can be distributed by a conventional ducted forced air system or a hydronic radiant system (both common to Flagstaff). To provide air conditioning, the process runs in reverse. Heat is removed from inside the home and transferred to the fluid loop buried in the ground. As the warm fluid travels through the ground loop, it is cooled. In the cooling mode, the earth acts as a "heat sink," a place to deposit heat from inside the home. As a bonus, a



geothermal unit may also provide some, or all, of your home's hot water needs.

A geothermal system can be easily installed in most homes. According to David Vette of

GeoSource in Sedona, "a system in Flagstaff will require two 5- to 6-inch holes drilled to a depth of 250 feet to provide enough earth contact for an efficient ground loop." Drilling

a hole that size is typical when drilling a well in this area. A properly designed system can reduce the fossil fuel consumption of a typical home by 70 percent. Geothermal systems can have high start-up costs, so it is important to weigh the cost vs. payback time for a system before deciding to install one. This can be done by using an energy consultant or other industry professional. Current laws allow the purchasers of geothermal systems to take a 30 percent tax credit on their federal return for systems installed until the end of 2010. This subsidy could make the difference when deciding to install a system. **FBN**

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