

# Your HOME

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## Home heating possibilities reside in your own back yard

BY MONICA M. WALK  
Special to The Reporter

Deep snow. Frigid temperatures. And a toasty warm home from tapping into seemingly frozen ground?

Even in wintry Wisconsin, yes.

Geothermal heating sounds like an oxymoron in northern climates with winter weather. Yet, below a frost line about 4 feet deep, even Wisconsin ground maintains the Earth's fairly consistent temperature of 50 degrees.

"Think of it as stored solar energy," said retired engineering professor Tom Schuppe, who with wife Karen Lindberg-Schuppe recently converted their Fond du Lac area home to geothermal heating. The current Wisconsin winter also was not a deterrent to the installation of the geothermal system, which was completed in January.

And while a 50-degree year-round ground temperature may be surprising, it still isn't an optimal residential temperature. That's where the seemingly magical science of geothermal technology raises pressure, temperature and comfort levels—while lowering carbon emissions and heating costs.

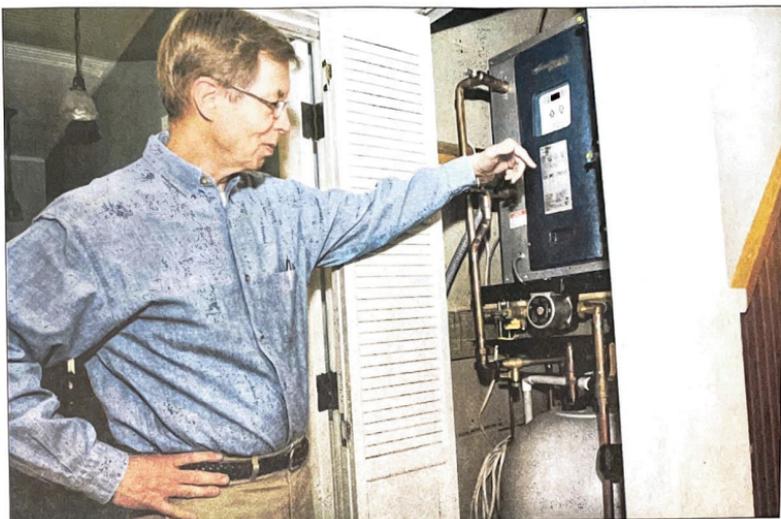
It's actually an old idea receiving renewed focus, especially as fuel costs rise along with environmental concerns.

Geothermal heating is responsible for geysers and the naturally occurring hot springs used for ancient and current bathing in locations around the world. That water is heated to significantly higher temperatures naturally, as it flows from deeper within the earth and closer to the planet's hot core.

Geothermal residential heating doesn't require a nearby natural spa, only that average 50-degree ground temperature and equipment to extract, focus and distribute the heat. Even this type of residential use isn't a truly a new idea: Geothermal residential heat has been in use overseas for more than 50 years, and in the United States it first experienced popularity in the 1970s during the embargo on oil, when many alternative methods for home heating flourished, including wood stoves and furnaces, electricity and solar panels.

### Interest on the upswing

Interest in geothermal heating systems increased locally three years ago, when fuel prices also spiked, according to Sean Steffes, owner of Advanced Custom Geothermal LLC, located in St. Cloud and Kiel and installer of Schuppe's system.



Tom Schuppe talks about the geothermal furnace unit in his home north of Fond du Lac.

THE REPORTER PHOTO BY JUSTIN CONNAHER

### PART ONE OF A TWO-PART SERIES

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"When gas prices jumped in 2007-2008, my business went berserk," concurred Rick McCutchin of Alternate Energys Inc. of Wrightstown, who installs geothermal units in homes throughout the state, including more than a dozen in the Fond du Lac area. "Gas prices kick-started it. Once the word got out there, more people are getting into it."

"When fuel was cheap, it didn't make sense," said Steffes, acknowledging the higher installation cost of a geothermal heating system. "Now that payback is five to eight years, it makes sense."

McCutchin reports that homes replacing LP gas with geothermal may get a return on their investment in three-to-five years, and that he has seen some homeowners experience a zero-year—or immediate—return, due to an ongoing tax credit for geothermal installation.

While natural gas remains relatively cost-effective, homeowners looking to replace LP gas and fuel oil are finding geothermal financially attractive.

Consumers who install geothermal heat pumps before Dec. 31, 2016, are eligible for a 30 percent tax credit, which can reduce the cost difference significantly. (See <http://www.energy.gov/taxbreaks.htm>)

Both business owners report they install an equal number of geothermal units in new construction and in existing homes.

### \$10,000 investment

Homeowners putting traditional gas heating systems into a new home can expect an approximate \$10,000 investment, according to Steffes. A geothermal unit doubles that cost. But, the 30 percent tax credit brings the cost difference closer to \$4,000.

"New gas furnaces have a life expectancy of about 12 to 15 years," Steffes said. "Geo units last about 28 years. So, you could put two gas furnaces into a home or one geo. And when you have to replace the geo furnace, the loop [infrastructure] is there," which reduces replacement cost compared to the initial investment. Fuel prices 15 years from now are also unknown, he noted.

Tom Schuppe replaced both traditional gas heat and cooling and a water heater that had lasted in his home for nearly 25 years. The 1925 home initially was a lakeside cottage prior to remodeling and has no basement. With both the water heater and home heating system on the ground level, Schuppe became concerned that a leak could flood the house. Due to age, it seemed logical to replace the whole system.

The tax incentive increased Schuppe's growing interest in geothermal.

"It's like going to Kohl's and getting 30 percent off," he laughed, referring to the retailer's coveted top coupon discount. "There is no limit on the amount the unit can cost." To qualify for the tax credit, the system must be put in by a certified installer.

Schuppe estimates that the listed cost of traditional appliances would have been about one-third of the geothermal installation. "But, I would pay higher bills," he said. "I will be getting 'down-

stream' savings. And I like the fact that it is green. It doesn't burn anything. Natural gas dumps carbon into the air. It does use more electricity, but I think windmills make environmentally safe electricity."

### Big savings anticipated

Steffes, whose company has installed about 20 geothermal units in homes in Fond du Lac County and more throughout the state, estimates that customers will save 40 to 70 percent on heating bills, although electric bills do increase in cold months. The electricity that is used to run geothermal units is less than for conventional electric heating and cooling systems.

"Electric costs might double," in some months, McCutchin said.

But he notes that if it takes an additional \$600 in electricity to heat a home for the three coldest

months of the year and another \$400 spread out over the rest of the year, that total of \$1,000 in additional electricity required for geothermal heat is still a savings over the \$2,000-\$3,000 the homeowner previously paid for LP gas.

"It depends on variables like fuel (being replaced), home age, insulation and how warm they keep the thermostat," Steffes said about savings, noting that many owners of older homes keep the thermostat between 60 and 65 degrees in winter to save on fuel costs. Geothermal homes, he said, can usually be kept warmer—70 to 72 degrees—and more comfortable for less money.

Customers are surprised by the comfort and evenness of home temperature provided by geothermal, McCutchin reports. "Their old system had temperature swings and now they have very even temperatures," he said.

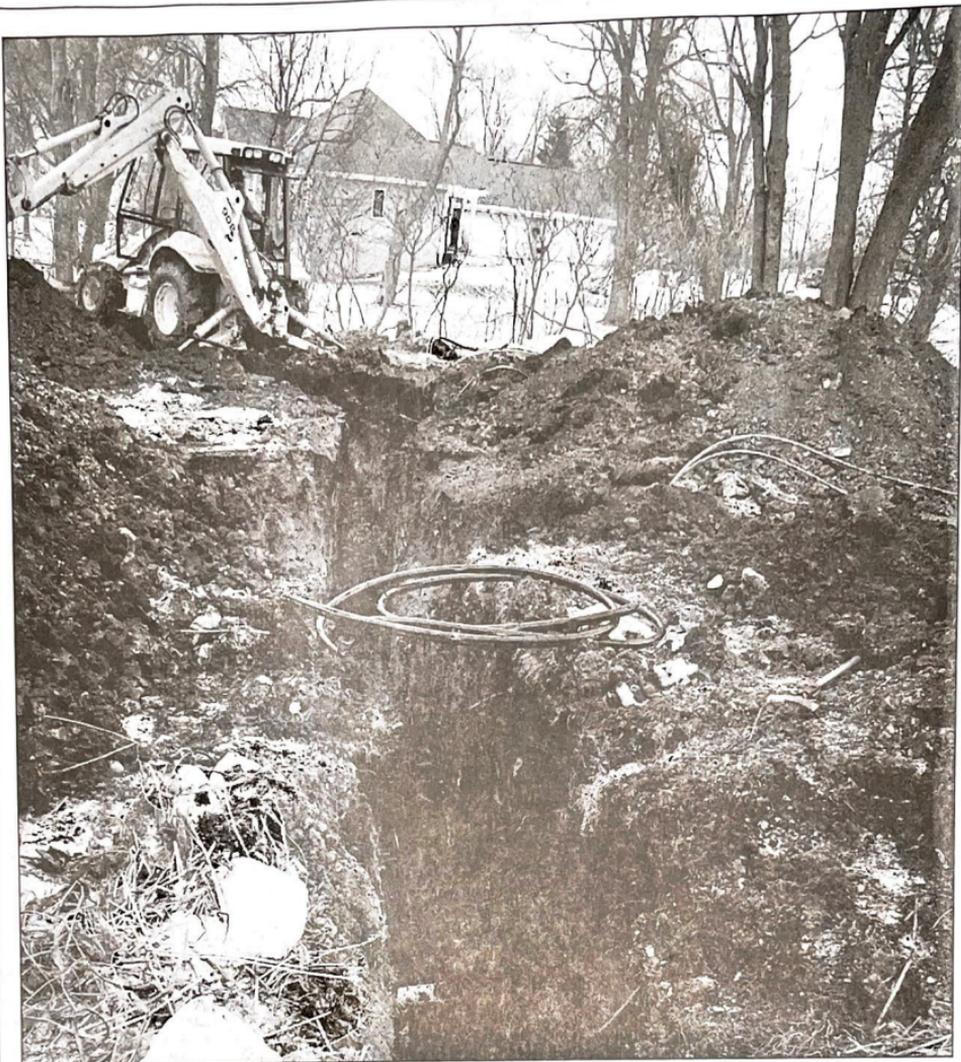
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SUBMITTED PHOTO

This deep trench was excavated to install a geothermal system at the residence of Tom Schuppe and his wife Karen Lindberg-Schuppe along the East Shore of Lake Winnebago. The system was installed by Advanced Custom Geothermal LLC, located in St. Cloud and Kiel.

## See geothermal heating in action

Special to The Reporter

Interested in learning more about geothermal heating or seeing it in action?

Opportunities for education and viewing are scheduled in Fond du Lac.

■ The Home Builders Association of Fond du Lac and Dodge Counties Inc. hosts its annual Home and Garden Show, March 25-27, at the Fond du Lac County Fairgrounds. (<http://www.homebuildersfdldodge.com/homegardenshow.html>)

Among the vendors displaying building, remodeling and decorating products, Air-Tech Heating of Fond du Lac office manager Sarah Price reports their company will feature geothermal products and will host a seminar on geothermal heating.

■ Fond du Lac County UW Extension's Energy Tour 2011 is scheduled July 29 as a precursor to Prairie Fest on the UW-Fond du Lac campus the following day.

Community Development Educator Diana Tscheschlok says this year's tour theme is "Triple Bottom Line: Decision-making for People, Profit and

Planet" and will feature renewable energy generation and energy-efficient technologies. (<http://www.fdlhealthyair.com/>)

The Morris-Harris home with geothermal heating, green electricity and a newly installed tankless water heater will be featured on the tour.

Wildlife Acres Subdivision, south of the city at Highway 151 and County Trunk V also will be included on the 2011 tour.

The development, run by general partners Ron Widell and Mark Weber (Ron Mark Land Co.), features drainage ditches and swales, a communal pond that adjacent residents can use for geothermal heating and cooling as well as landscaping and lawn care, and lots sited for southern exposure and passive solar gain.

Weber reports their geothermal plans are based on a Focus on Energy study and modeled on the ponds used for geothermal heat by Fond du Lac High School.

Past energy tours have featured the geothermal system installed at Horicon Bank and high efficiency appliances at Culver's.