

Home & Real Estate

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PAUL AND DENISE REDDINGTON have built their retirement home in Glastonbury using a geothermal heating and cooling system.

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NEW HEAT WAVE

Glastonbury Couple Among Those Using Geothermal Home Systems

The hardwood floors, abundant light and meticulously crafted built-ins are what you notice first when walking into the Glastonbury home of Paul and Denise Reddington. But it is what is in the basement — and hidden under the lawn and inside the foundation — that Paul can't wait to talk about.

Paul Reddington, a retired Pratt & Whitney mechanical engineer, designed the energy-saving features of the house, custom built for the couple in 2007. So after a cursory tour of the main floor, he heads down a flight of stairs to show off the feature that makes him most proud.

In a storage room in the finished basement sits a WaterFurnace Envision dual-capacity geothermal heat pump, the heart of the system that heats and cools the 3,200-square-foot house. Tentacle-like hoses extend up from the box-shaped pump and wind around the upper edge of two walls to a cluster of pipes leading out of the foundation.

Beyond that, hidden from view, are loops of polyethylene pipe stretching 300 feet into the ground in two vertical wells. The pipes are filled with water that — because the temperature range of the ground at that depth is 48 to 52 degrees — stays warm year-round.

Depending on the season, the heat pump transfers the heat energy into or out of the house to keep it warm or cool.

Together with other features, including photovoltaic panels on the roof, the system is delivering lower-than-predicted energy costs, Reddington said. In 2012, the couple

Warming Up To Cool System

Geothermal Popularity Rises

By LORETTA WALDMAN | Special to The Courant

spent a total of \$1,600 on energy. Their electric bill for May, June and August was \$16 per month, the basic monthly distribution charge, he said.

That kind of savings, along with the tax credits and rebates available toward purchase of equipment, is making geothermal an increasingly attractive option for homeowners. While upfront costs are admittedly steeper — about 30 percent to 40 percent more than gas and oil — that expense is recouped within three to seven years because of the lower energy costs associated with running a geothermal system, according to industry and government estimates.

"I thought it was a good thing in 2007," Reddington said of the decision, "and

with today's energy prices, I think it's an even better thing to do."

Geothermal is a niche market compared to oil and gas — less than 2 percent of residential and commercial buildings in the United States — but heat-pump sales have been rising since the 1980s, according to Geothermal Exchange Organization, a nonprofit education and advocacy group for the geothermal heat pump industry.

Demand is strongest in the West and Midwest, where the four major heat-pump manufacturers are based, GEO spokesman Ted Clutter said, but geothermal projects are popping up across the country and include the Juno, Alaska, airport, an IKEA store in Centralia, Kan., and the retail pavilion at the Statue of Liberty. In Connecticut,

geothermal accounts for about 7 percent to 10 percent of all heating and cooling system installations, most of which are residential, said Guy Wanegar, the Windsor-based heating, ventilation and air conditioning contractor who installed the Reddingtons' system. Wanegar says his business has grown from four or five geothermal installations a year to 50, or about 95 percent of his business, since he began doing installations in 1995. About 70 percent of that work is new construction, he said, and 30 percent is retrofitting existing buildings.

Wanegar, who owns A&B Heating and Cooling, attributes the growth to a variety of factors.

"I think people are steering toward a cleaner energy source and nothing is cleaner than geothermal," he said, "and it can save you more than natural gas. I think the word is getting out that nothing is better for your pocketbook than a properly installed geothermal system."

The Internet has made it easier than ever for consumers to research and compare systems, said Wanegar, who also is past president of the Connecticut Geothermal Association, a trade group representing the state's geothermal heating and cooling contractors. Then there are the federal tax credits and other incentives.

Since Jan. 1, 2009, homeowners installing geothermal systems have been eligible for a one-time federal tax credit of up to 30 percent of the cost of qualifying equipment. Systems installed before that are eligible for the same tax

GEOTHERMAL, 7/4

PAUL AND DENISE Reddington have a geothermal system in their home.

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Geothermal

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credit up to \$2,000.

In Connecticut, rebates of up to \$1,500 also are available through Energize Connecticut, a smart-energy initiative funded through a charge on utility bills. The incentive is part of an overall energy audit and applies to a variety of energy-saving equipment installations, including natural gas systems and tankless hot water heaters. That alone is not likely to sway homeowners, said Al Lara, a spokesman for Northeast Utilities, but when combined with the tax credit and energy savings over the life of the system, it's a persuasive package.

Since making the switch, Dr. Fritz Bunke said he spends about \$2,000 annually to heat and cool his house with a geothermal system modeled after the one designed by Paul Reddington, his neighbor. That's the same amount it cost to heat his previous house for a month during the winter of 2011 with propane, Bunke said.

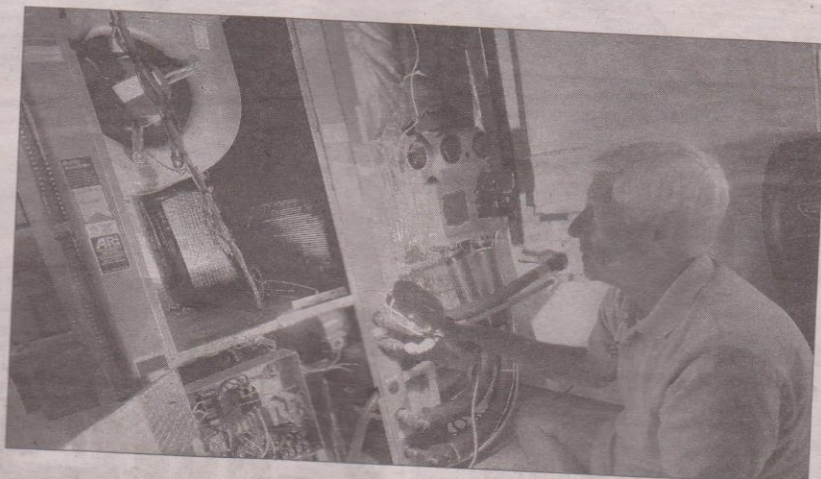
Like the Reddingtons, Bunke and his wife, Janet, installed their system when they built the house in 2010. At 1,800 square feet, it is roughly a third the size of their old home and far better insulated. Even with the incentives, Bunke said he spent about \$10,000 more to go with geothermal instead of an oil or gas system, but he has no regrets.

"I'm very happy with the system," Bunke said.

Geothermal works best in homes that are well-sealed and insulated, said Reggie Jacques, the builder and developer of East Carriage Drive, where the Reddington and Bunke homes are located. The foundation of Paul and Denise Reddington's house has two, 4-inch thick concrete walls with 2 inches of foam insulation between the two slabs. Beneath the floors of the house is another 2-inch layer of foam insulation. In other areas Reddington used insulation made from shredded newspaper and blue jeans.

Reddington said he spent about \$35,000 for his system, but it has more than the usual number of bells and whistles, such as a gas-powered backup hot water heater in case of a power outage. The average installation cost for a 2,000- to 2,500-square-foot home in Connecticut runs about \$30,000, Wanegar said. An oil system, by comparison, costs a little more than half that — about \$16,000 — and a gas system costs about \$800 less than oil, he said.

Nationally, the average geothermal installation is considerably less. A 3-ton heat pump system — the size needed to heat and cool a typical 2,000- to 2,500-square-foot home — averages about \$17,000, GEO spokesman Clutter said. The equivalent gas, electric or oil



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THE REDDINGTONS' retirement home in Glastonbury has a geothermal system.

system, by contrast, costs from \$10,000 to \$12,000, he said. Prices are higher in the Northeast and California, Clutter said. In Connecticut, the higher cost is driven by higher fuel and labor costs and the added cost of drilling into granite, Wanegar said.

New construction, of course, is the optimal way to incorporate such features, but it is also possible to retrofit existing homes with geothermal. Since the recession, existing structures account for about 70 percent of the geothermal system installations nationwide, Clutter said.

In February, Habitat for Humanity of Northwest Connecticut announced it would be installing a geothermal heating and cooling system in a single-family home it was rehabilitating in North Canaan. The long-term affordability of geothermal made it the perfect choice, said George Massey, a member of the Habitat board. Peter Tavino, head of the Litchfield County Chapter of CGA, approached the nonprofit looking for a public service project, Massey said. Habitat leaped at the offer and CGA coordinated the pro-bono installation in partnership with 13 member contractors who donated labor, drilling, materials and the heat pump.

Long-term affordability was certainly a factor for Tommy and Elizabeth Hyatt, who installed a geothermal system in their Cromwell home last year, but not the only one. The couple — who grew up in the West — preferred gas heat. They also disliked the way the baseboard heaters of their existing oil system limited where they could put furniture in their 1,728-square-foot colonial. Faced with the choice of having to replace the home's aging oil tank and boiler or pay about \$90,000 to connect to the nearest gas main, they looked at geothermal and decided it made sense.

A low-interest Smart E Loan through Energize Connecticut helped the couple

cover the \$40,000 cost of the conversion, but with the tax credits and rebates the actual cost was more like \$28,000, Hyatt said. Like Reddington, Tommy Hyatt is a mechanical engineer and works at Pratt & Whitney. He approached his retrofit with the same passion and precision as Reddington and documented every step of the installation in a blog, Tommy's Geothermal Project (bit.ly/1j7qwhZ).

Hyatt figures the new boiler and oil tank they needed would have cost \$5,000 to \$10,000. Installing central air, which they planned to do later, would have added another \$10,000 to \$15,000 to that. With geothermal, Hyatt says he not only avoided that expense but is saving about \$2,000 in heating costs a year. Other benefits include a bump in the value of their home.

And with geothermal, the air inside the house retains more humidity and has fewer allergens, Hyatt said. Best of all, Elizabeth and the couple's three young children — who are home during the day — no longer need to wear jackets to stay warm the way they did when they heated with oil.

"The air in the house is substantially more comfortable," Hyatt said.

As amenities go, geothermal is a big draw, said Margaret Wilcox, an agent with William Raveis in Glastonbury and the listing agent for East Carriage Drive. A well-installed geothermal heating and cooling system can increase the value of a home by 7 percent to 8 percent or more, depending on the property, she said.

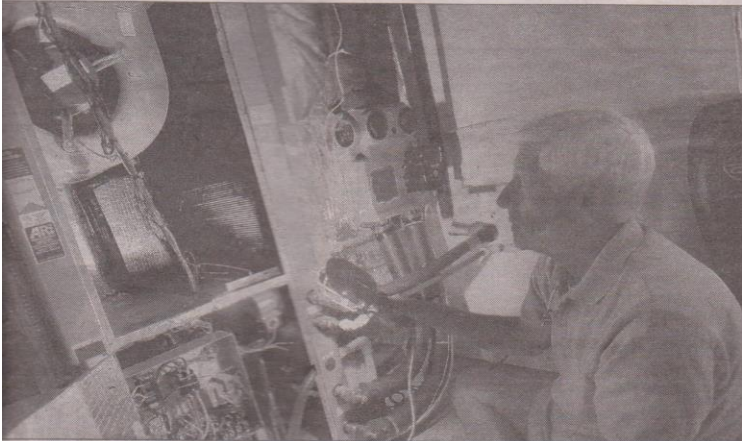
"Absolutely, people are willing to pay more for that and other energy-saving features," Wilcox said. "They see it as future energy cost savings. We're all becoming more environmentally selective."

Geothermal energy has become part of alternative energy policy at the federal and state levels.

In Connecticut, Gov. Dannel P. Malloy has embraced broadly a portfolio

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Geothermal energy has become part of alternative energy policy at the federal and state levels.

In Connecticut, Gov. Dannel P. Malloy has embraced broadly a portfolio

approach to energy that includes geothermal technology, said Alex Kragie with the state's Department of Energy and Environmental Protection.

This winter, the state announced plans to build a nature center at Hammonasset Beach State Park in Madison equipped with geothermal heating and cooling, as well as photovoltaic panels for generating electricity.

Since the downturn, growth of geothermal installations across the country has been flat, said Doug Dougherty, president of GEO. Institutional installations, most notably schools, account for much of the 2 percent growth, he said. But once new home construction bounces back, Dougherty believes the geothermal share of the market could grow to as much as 10 percent.

Systems come in a range of configurations determined by the natural features of the property and the size of the home or building. The Hyatts, Bunkes and Reddingtons went with a "closed loop" that relies on the constant heat of the ground to maintain the warmth of the water in the sealed pipes, or ground loops.

Such systems can be configured horizontally or, where space is limited, vertically to depths ranging from 150 to 400 feet deep or more. Where fresh water from a well or nearby pond is available, open systems such as pond or well water loops are an option, along with another type called a standing column well.

Wanegar does not see the cost of geothermal coming down any time soon, given the fixed installation costs and heat pump prices, which are not inflated, he said. But like Dougherty, he is optimistic that sales and installations will continue to rise.

CGA is working to expand incentives and would like to see a lower electric rate for homeowners using geothermal. The group's other focus is educating HVAC contractors to ensure that those doing geothermal installations are doing them right, Wanegar said.

The Connecticut Department of Energy and Environmental Protection already recognizes the clean-energy potential of geothermal in parts of the state too remote to bring in natural gas, Wanegar said. And energy companies and at least one bank are now financing institutional and residential projects, he said.

At the national level, GEO is pushing to extend federal tax credits for residential and commercial geothermal heat pump installations to the year 2020 instead of having them expire at the end of 2016.

"I think as the adoption of the technology goes up, so will the ability of people to do the economic analysis on what they will get in terms of return on investment," Dougherty said. "The numbers are the numbers and people are saying, 'Wow!'"