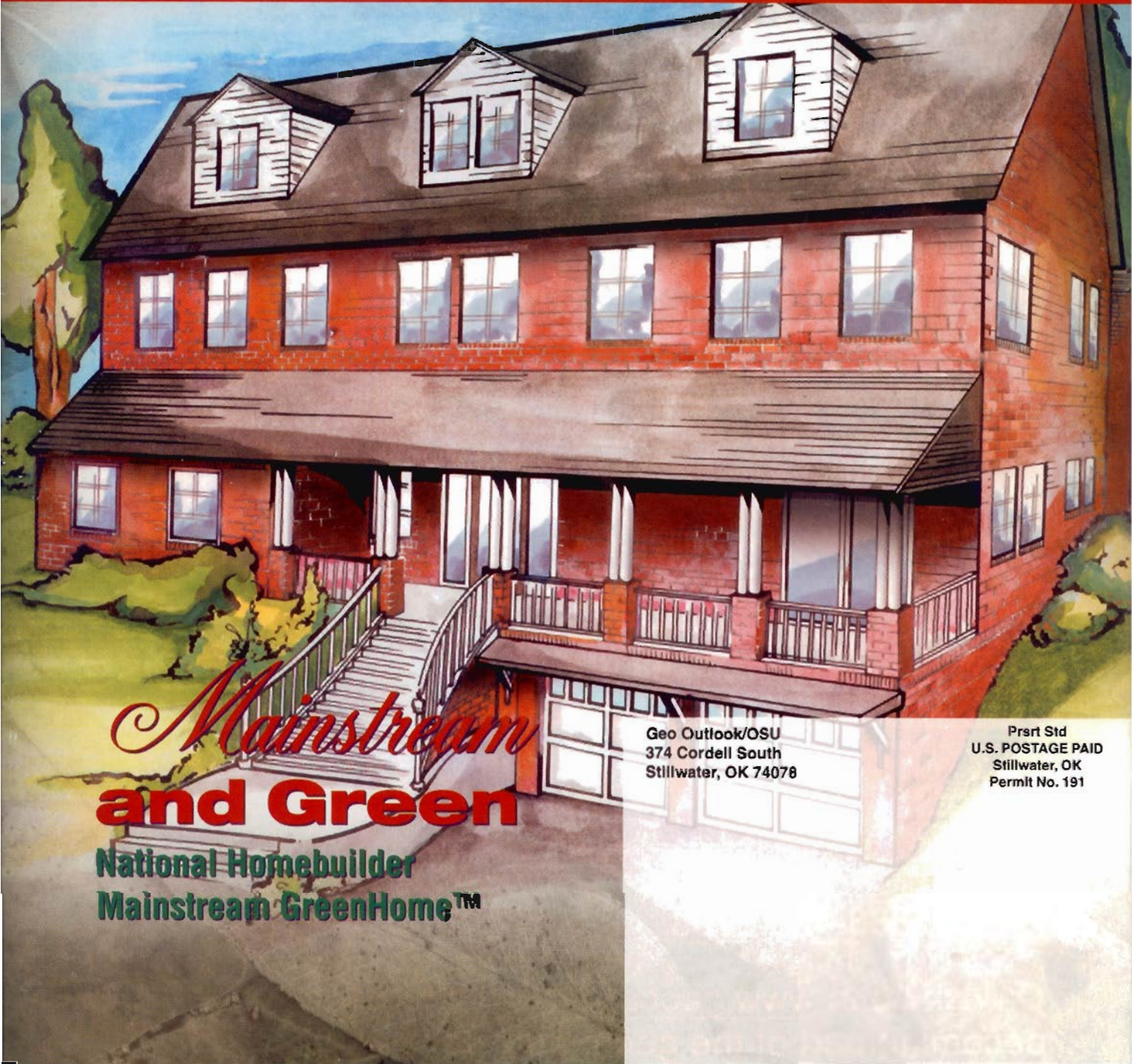


GEO OUTLOOK

GeoExchange: Energy Smart • Financially Sound • Environmentally Friendly

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Sotirios Fanis and his family stand outside their partially constructed home in Thessaloniki, Greece.

In the early morning, Mount Olympus sits above the Thermaikos Gulf lightly shrouded in mist. In the evening, neatly sectioned fields catch the final rays of the setting sun. These are the views Sotirios Fanis, a system operator and computer technician in Thessaloniki, Greece, and his family of six can see anytime by looking out a window or stepping out onto their back porch.

"We love the peace, great weather, thousands of kilometers of beautiful coasts, with no sharks," Fanis said. "I could tell you a million reasons for what we love about living in Greece and make you want to move here. So, generally, it's a very beautiful country with great people."

Perhaps the natural beauty and centuries of rich history and civilization that make Greece one of the world's top tourist destinations also make it easier for its citizens to be environmentally conscious, but it was mostly economics that pushed Greece into one of ground source heat pump technology's newest markets.

GSHP Market Beginning in Greece

Skyrocketing oil prices over the past few years hit Greece much like the rest of the world and served as a primary reason Fanis researched energy conserving and cost-effective heating and cooling systems before the construction of his new home began in March 2005.

"Geothermal technology was unknown in Greece until oil prices were launched into space, and then people woke up and started researching for an alternative way for heating," Fanis said.

Fanis' search led him to a WaterFurnace Web site and then to Christos Bousgolitis, the sole WaterFurnace dealer in Greece. Bousgolitis' own path into GSHP technology had only begun a year earlier.

Bousgolitis' degree in mechanical engineering and a civil-geotechnical engineering degree he obtained while working for a consulting company led to his discovery of ground source technology. "I had the opportunity because of my studies to combine the soil and the mechanical things, the heat pumps," Bousgolitis said. "I think the problem (with GSHP) is that two kinds of sciences must be combined, the geotechnical/geologist and the mechanical engineer. This is something difficult to be done in the beginning."

It was while preparing a house study as a civil engineer in early 2004 that the home's owner, who also knew of Bousgolitis' mechanical engineering background, asked for an opinion on the heating and cooling of his home. Bousgolitis conducted some Internet research before recommending a system and uncovered the International Ground Source Heat Pump Association's site and its annual technical conference.

From Gathering Knowledge to Opening Shop

Bousgolitis fulfilled a longtime desire to visit the United States when he traveled to Stillwater, Okla., to attend IGSHPA's 2004 Technical Conference and Expo in April and gather as much knowledge on the technology as he could before returning to Greece.

He became the first Greek and only the 35th international resident to complete and receive the Certified

Geoexchange Designer (CGD) designation. He also met GSHP pioneer and IGSHPA's executive director, Jim Bose, who had an interesting prediction for him and the only other international attendee that year, professor Javier Urchuegia from Spain.

"Dr. Bose invited us into his office," Bousgolitis said. "Finally, he said to the professor that he is going to take all the glory in his country as a pioneer in the technology and to me that I am going to make a very good profit as a pioneer to the installations."

Bousgolitis took Bose's words to heart and began searching for the right heat pump manufacturer for his business. At the time, most units in the United States used R22 refrigerant which wasn't allowed in Europe. "Only WaterFurnace had the right units for me, water-to-water with R410a refrigerant, reversible, and hot water from a desuperheater," Bousgolitis said. The fact WaterFurnace already had a European distributor, Geothermal International, located in the United Kingdom made the decision easier.

With his newfound knowledge and certification in GSHP technology, Bousgolitis returned to Greece and opened his business in Thessolaniiki. His first project was commissioned in April 2005 for the same homeowner who had originally asked Bousgolitis' opinion on a heating system. "Now, in his every phone call he is saying that he is more satisfied than he ever imagined," Bousgolitis said.

Loop Designed for Limited Space

When oil prices surged, Greeks found themselves paying two to three times more for all oil based products, Bousgolitis said. As of January, diesel fuel cost one euro per liter, which in U.S. terms is almost \$5 a gallon. Oil based heating is also the most common way to heat a home in Greece, Bousgolitis said. "At these prices, it is 70 percent cheaper to heat with GSHP than to burn oil," he said.

Cost was one of several reasons Fanis and his family decided to install GSHP technology in their new home. "I like my geothermal system because it is economic, safe, quiet, no smoke, no fire and no frequent service," Fanis said. "I like most that I am not dependent on oil."

Bousgolitis, who believes his company may have been the first to do a residential vertical closed loop system in Greece, designed a vertical ground loop for Fanis' two-story, 200-square-meter (2,153 square feet) home outside the village of Epanomi. The system required three boreholes drilled at 300 feet deep and a WaterFurnace EKW17 water-to-water reversible unit with a 60,000 British thermal unit (Btu) per hour capacity.

While Fanis' 4,500-square-meter (1.1 acre) home site in the country did have space to do a horizontal loop, Bousgolitis said he believed lack of open land in Greece for horizontal configurations would establish the vertical closed loop as the ground loop configuration of choice in his country.

Building a Home in Greece

Fanis and his family of six moved into their partially completed home in August 2006 from a small two bedroom, one bath apartment. When completed, his house will have five bedrooms, a kitchen and salon on each level, and three bathrooms. "We decided to build to have more space for my family and better environ-

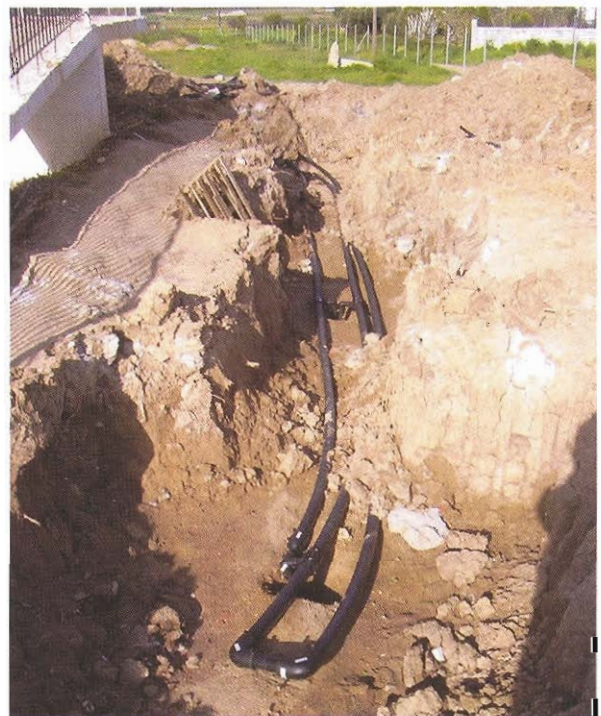


Photo courtesy of Christos Bousgolitis.

A vertical ground loop configuration, like this one dug along Fanis' front porch, may become the space saving loop configuration of choice for Greece.

mental conditions,” Fanis said. “Our children will grow up in the countryside.”

Fanis was heavily involved in the construction of his home and had to find workers for every part of the construction process. While having to personally deal with the stressful process of overseeing staff and handling mistakes in construction, Fanis had sincere appreciation for Bousgolitis’ part in the construction. “I like very much working with Christos (Bousgolitis),” Fanis said. “He made my life easy, and he did excellent work.”

Yet, Fanis’ GSHP installation was not without its challenges. “The weather changed rapidly one night by the north winds,” Bousgolitis said. “The water became ice and one water pump of the drilling machine cracked. The drillers had some bad times but solving problems on their drilling machine is an everyday job for them.”

With a few breaks in the weather, the three boreholes were finished in a month, all the joints in two days and in another two days the unit was ready to run, Bousgolitis said.

One of the major differences in construction in Greece from the United States is that Greek homes are

made from reinforced concrete due to seismic activity in the country, Bousgolitis said.

“We use a lot of hydronic systems indoor, like radiant floors or fan coils,” Bousgolitis said. “We are using reinforced concrete for building our houses. It’s difficult to pass all the ducts inside the house. You are using steel or wood (in the U.S.), and you have more free space to work your air ducts.”

The difference in home construction, units of measurement and language were all hurdles Bousgolitis had to overcome when he traveled to the U.S. to receive his training at IGSHPA. By overcoming those challenges, Bousgolitis gained the knowledge he needed to complete a successful GSHP project like the Fanis home and the CGD designation.

Sudden Market Growth Causes Some Concern

“When I started, there was no one here,” Bousgolitis said. “No one existed in the market. Suddenly, because of the oil prices in the last year, a lot of people want to be involved in this technology.”

Photo courtesy of Christos Bousgolitis.

A rush of new GSHP dealers and contractors may not be a good thing to the growing interest in the system in Greece. “We have a great future, but I don’t know what will happen because most of the people are not sufficiently trained,” Bousgolitis said. “This is a problem in the beginning. The first project, when you start, must be excellent.”

Bousgolitis’ worry of what untrained and inexperienced GSHP dealers and contractors

will do to the market is all too familiar to Tony Cooper, WaterFurnace Global president. Bousgolitis’ concern is exactly what happened to the GSHP market in the U.S. about 11 or 12 years ago, Cooper said.

Incentives, low-interest loan programs and other support for GSHPs abounded in U.S. from 1993-95 causing thousands of contractors to enter the market, Cooper said. “The problem with that was the market size had not developed enough to support those people as contractors,” he said. “You had a lot of contractors doing one or two installations a year, which is not adequate to keep them trained and understanding of the changes in the technology.”

“There are not enough people with experience behind those companies to make sure the installations go correctly,” Cooper said. The result was a large number of problematic or failed GSHP installations that hurt the U.S. market in that time frame, he said.

Having the support of WaterFurnace and its European distributor Geothermal International has been just as important as IGSHPA training and CGD designation to Bousgolitis. “That’s why I’m very happy to work with them,” he said.



Homeowner, Sotirios Fanis, signals that all is well as his ground source heat pump system and WaterFurnace unit starts up for the first time.

Even with the concern of U.S. GSHP history repeating itself in Greece, both Bousgolitis and Cooper have positive expectations for the market in Greece. “The residential market, in my opinion, is going to grow rapidly if all the people who are involved act responsibly,” Bousgolitis said. “From our place, we are going to provide our customers great value products like WaterFurnace’s heat pumps and the ground loops designed and in-

stalled by trained people at a fair price.”

Cooper said he expects the market in Greece to expand and grow for WaterFurnace because of the government’s support, a good distribution network, high profile projects that are producing very satisfied customers and people like Bousgolitis. “Christos and his company are doing a super job and that company is looking at different ways to expand and put more resources into the market,” he said.

Nurturing a Young Market

Bousgolitis’ business approach and startup have been unique because the technology he sells is so new in Greece. Bousgolitis had to personally teach his team of drillers and plumbers everything about the GSHP technology from how to do the joints to flushing and purging the system, he said. By introducing the drillers and plumbers to the technology, Bousgolitis has earned their trust and can feel confident about their quality of work.

He said he is also trying to keep his profits low to make the cost of a residential GSHP system affordable for customers in order to build up the market. To do this, Bousgolitis relies on investments and his family’s

support to live on while his business incurs the costs of new equipment and waits for the number of jobs to increase.

“I think that everyone deserves this kind of system at a fair price,” Bousgolitis said. “I strongly believe that in the future the jobs are going to be much more multiplied, and I will have a good profit for my business.”

The Fruits of One Pioneer’s Labor

In two years as a WaterFurnace dealer, Bousgolitis has sold 13 units in Greece’s young GSHP market. In November 2006, with the encouragement of Geothermal International, Bousgolitis opened a second location in Athens. After two months in operation, Bousgolitis had yet to sell any units from the new location but had attracted several visitors making him sure he would have new projects from that location very soon.

Bousgolitis understands that the life of a pioneer in any area can be difficult, but he has worked hard to prove Dr. Bose’s predictions of a profitable future. “I am grateful to Dr. Bose because of his words and to his long-term devotion to the technology at much more difficult times,” he said.

The sacrifice and investment of Bousgolitis’ time and money are worth it to him because he believes in the technology. “I’ve never regretted my decision to be involved in GX technology,” Bousgolitis said. “I am doing something that is great. We are installing a renewable energy source, and we are ready for the opening of the market after the big increase of the oil prices.”

By differentiating his company from others in Greece with special CGD training, a strong academic background for understanding the technology and a supportive heat pump manufacturer and distributor, Bousgolitis finds himself with a growing list of satisfied customers at a time when Greece’s GSHP market is ripening. “I am considered a pioneer in my country, and I believe in a good future profit for my family, but the greatest reward for me is the unbelievable satisfaction of my clients,” Bousgolitis said.

Christos Bousgolitis
www.geoexchange.gr

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