

## Digging deep for energy savings



There's a cheaper energy source located underground.

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It may sound too good to be true: a technology that converts solar energy soaked up by the earth into heat, hot water or cool air—without generating carbon dioxide emissions or high energy costs.

Called geothermal systems—or geoexchange systems—this technology is 48 per cent more efficient than the best gas furnaces and 75 per cent more efficient than oil furnaces, according to the non-profit Canadian GeoExchange Coalition ([www.geo-exchange.ca](http://www.geo-exchange.ca)).

That translates into much lower energy costs for homeowners, school districts, industry or other consumers. And perhaps a bigger bonus: it also means a cleaner environment as no fossil fuels are burned in the process.

So how does it work?

Much like a common refrigerator, according to Barry Milner, marketing director for GeoTility Geothermal Systems in Richmond.

Essentially, one or more ground source heat pumps transfers heat from one place to another, via loops filled with non-toxic fluid installed vertically or horizontally in the ground or in a lake, pond or ground water.

Substantial drilling is often necessary. Installing a system horizontally requires a space of about 50 feet by 100 feet—a space that could be paved over, but not built on—so most home systems are installed vertically, often down to about 200 feet.

Richmond residents, however, have an advantage in the local geology.

Milner says heat transfer is better and the cost is about 20 per cent less here as compared to South Surrey or Langley due to Richmond's compact sand and a high water table.

"It's easy to drill, like a hot knife through butter."

The energy is then harvested from below the earth's surface. At about three meters underground, locally the temperature remains constant at about 12°C. This represents a generous source of renewable thermal energy.

"With a little bit of electricity, we can bring that (temperature) up to 46°C. We can take \$1 worth of energy and get \$5 worth of energy out of it," Milner explains.

"It is renewable energy. Every day the sun comes up—even if it's cloudy, there's still solar-radiant heat every day."

While it may sound ground-breaking, perhaps literally, this technology is not new. GeoTility's president, Jim Leask, turned his family's company towards geothermal systems back in the 1990s. Milner notes that the first registered system was installed in Sweden in 1932.

So why have geothermal systems been so slow to catch on?

A likely reason: installation costs.

Milner estimates that for a lot of homeowners, the price tag will run from \$10,000 to \$15,000, mostly due to drilling expenses.

"The irony is people won't blink about spending \$10,000 to \$15,000 on granite countertops that could become outdated, but whereas a geothermal system gets more valuable with time. It's a mindset, but there's a shift happening."

On average, homeowners will get their money back in savings in about seven years, Milner adds.

"They're expensive to install but inexpensive to operate and as energy costs continue to escalate, the payback period gets shorter and shorter."

And alternatives exist. Households don't need to own that loop in the ground—Geotility's sister company, TerraSource, installs geothermal systems as a utility company and charges predetermined monthly fees. Grants, rebates, provincial and federal incentives are also on offer for those with geothermal systems.

And this technology may be becoming mainstream at last.

GeoTility's recent projects include the BCIT Aviation Technology Campus, Steveston-London School and the Lotus development, among other major projects across the province. The company has a Kelowna office and also plans to open a Victoria branch this year.

"There's a new paradigm; people are looking at smaller houses that operate more efficiently—and if it costs less to live in, it means you have more disposable income in your pocket," Milner says.

"The environment would also be one aspect, but we also need to lose our dependency on oil and gas."