

Canada gets the buzz

Canada is looking beyond its fossil fuels, explains Nancy Argyle, communications and marketing director of US drill manufacturer Sonic Drill Corporation

DOTTED with oil rigs, hydro-electric dams, nuclear power plants, wind turbines and criss-crossed with natural gas pipelines, Canada's energy sources are both abundant and well-established.

So why has a country with such obvious energy advantages become so excited about geothermal? The answer can be found in the way of the dinosaur.

Despite the glut of fossil fuels that lie below ground in Canada, many energy strategists realise that the supply is limited, unless, as comedian Dave Barry points out, we start cloning dinosaurs and acquire a big asteroid to kill them off, thereby creating a new fossil-fuel pool.

While many geothermal users tout the environmentally-friendly aspect of this energy

source, in reality, it is the wallet-friendly aspect that drives most new installations. The savings in energy costs over five years more than pays for the initial up-front installation costs.

A mid-sized home using geothermal energy can have the same impact on CO₂ emissions entering the environment equivalent to the planting of one acre of trees per year. The average home in Canada can reduce CO₂ emissions by 2.5-5 t annually by using geothermal energy instead of electric heat or by burning fossil fuels. On average, a geothermal system can produce heat with an average saving of 65% over natural gas, 75% saving over fuel oil and 80% saving over propane. This results in a four- to six-year payback on the cost of installation.

Canada has become a leader in developing geothermal as an energy choice thanks, in part, to a patented innovative drill that uses sonic vibrations to drill faster, better and more cheaply, making it perfectly suited to geothermal

applications. Developed by Ray Roussy, president of the Sonic Drill Corporation, the Sonic drill-head drills between three and ten times faster than conventional methods and allows for drilling at any angle and in any geology.

Another key advantage to Roussy's drill-head is the ability to produce undisturbed, high-quality soil samples to a depth of 360 m. As a result, Sonic drills have become a favourite of environmental studies and land reclamation projects.

Sonic drills also offer a number of other advantages, including:

- In between, groundwater samples can be taken at various depths.
- Gravel filters can be accurately positioned and clay layers sealed.
- Little or no foreign matter such as water or drilling slurry is added.

The Sonic drill-head has a functional distinction in that it fluidises surrounding soil particles.

At first glance, a Sonic drill rig looks very much like a conventional air or mud rotary drill rig but a big difference can be found in the drill-head, which is slightly larger than a standard rotary head.

The head contains a mechanism necessary for rotary motion, as well as an oscillator, which causes a high-frequency force to be superimposed on the drill string. The drill bit physically vibrates up and down, in addition to being pushed down and rotated.

GOOD VIBRATIONS: SONIC DRILLING IN THE UK

The town of Woking in Surrey has typically been best known as the former home of author HG Wells, but today it is also known for its innovative approach to sustainable development.

In 2001, Woking won the Queen's Award for Enterprise for its energy services initiatives and, more recently, in January, it took the revolutionary step of installing a geothermal system to heat and cool a new sports pavilion.

The task of drilling the geothermal loop holes fell to a Dutch company – the only company in Europe to own a Sonic drilling rig, bought from the Sonic Drill Corporation.

"There was a lot of water and mudstone and limestone in the drilling conditions," according to Jan Heldens, president of Sonic Drilling, of Horst, The Netherlands. "For most drills, they would have got stuck."

Despite the conditions, Heldens and his crew were able to drill 106 m for each geothermal loop, at a rate of about 1.5 loops per day.

With the Woking project finished, Heldens and his team are back in the UK again, this time working for BP on a land-reclamation project. Once that job is finished, the Sonic drill rig is on its way to Glasgow to provide a demonstration for a highway project.



The Sonic drill-head at work. The unit can drill between three and ten times faster than conventional methods

