

Ground Source Heat Pump



The straight pipe is the outward flow pipe, the curled pipe is the return flow pipe

Introduction

The Irvings' have recently installed a ground source heat pump in a new build farmhouse, near Hawick in the Scottish Borders.

Background

This was a new build house on a green field site. Part of the ethos of the work was to look at the new technologies available for heating the house and to limit the impact on the environment.

Getting started

Research commenced at a very early stage and two companies were approached – Ice Energy www.iceenergy.co.uk and Invisible Heating www.invisibleheating.co.uk. Both companies were found to be extremely helpful with site visits, estimates and information. Ice Energy was the appointed contractor.

A grant was approved through the Energy Savings Trust www.est.org.uk.

Technology

This installation has one trench and one pipe. (In some instances more than one trench is required. This is more expensive as a manifold is required to link the sets of pipes).

The system works on the principle of heat exchange, water is pumped around the pipe and a heat exchange unit in the house extracts the heat and returns very cold water back into the system. This is again pumped around the pipe and is warmed by the ambient soil temperature. The warm water is used for central heating, and also to reduce the fuel requirement for hot water.

The geothermal unit reduces the dependence upon fossil fuels for the hot water and heating needs of the house. As yet it is too early to fully assess the benefits of the system, but it should lead to reduce heating costs. As this is a new build it will not be possible to do any direct comparisons, but typically heat pumps are three to four times more efficient than electric storage heaters. The system has been in operation since November 2006. The pay back period is currently calculated at around 10 years.

Using local tradesmen was one of the fundamental aims of the new build and the biggest hurdle at the time was finding a local plumber with knowledge of these units. However, a Borders plumber rose to the challenge and as he said himself

"It was a steep learning curve. The manual provided by Ice Energy was invaluable!"

This plumber is now installing other units in the Borders.

The only slight snag was the plumber not realising that the outlet pipe in the house from the heat exchanger back to the ground had to be lagged. The water in these pipes is so cold that ice built up on them, but no damage was caused.



A quick energy break!

Cost

Heat pump	£5 800
Ground loops	£650
Comm package	£900
Trenching	£360
Plumbing connections	£300
Electrical connections	£200
Building materials	£540
Total	£8 750
Grant	30%

The groundwork for the pipes and laying the pipes was done with own labour – so reduced costs. Building material was mainly sand to protect pipework from any punctures

Grant

A grant of 30% was given by the Energy Savings Trust towards the overall cost of the project. Accessing the grant was found to be very straightforward.

Before you start ascertain whether or not you will be eligible for grant. Often grants can be obtained if applied for as the householder, but not if applied for by the farm business.

Summary

Overall the system is working well and there are no regrets about having invested in the technology. As Mrs Irving says,

" Not only does the system keep the house warm, it helps heat the water. Investing in this technology can be likened to the old adage, farm for ever, but live yourself for the day. We are very pleased with the results of this heating system. "

" Electricity is required to operate the pump and condenser. So our next move may be to invest in a wind turbine to generate our electrical requirement for the house. The wind never stops blowing in this part of the world. "

Further information

Geothermal heating is best suited to new build scenarios. It is less suited to retro fit schemes as it generally requires underfloor heating.

For further information see

www.iceenergy.co.uk

www.invisibleheating.co.uk.

www.est.org.uk.