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Pure Energy Technology Ltd.

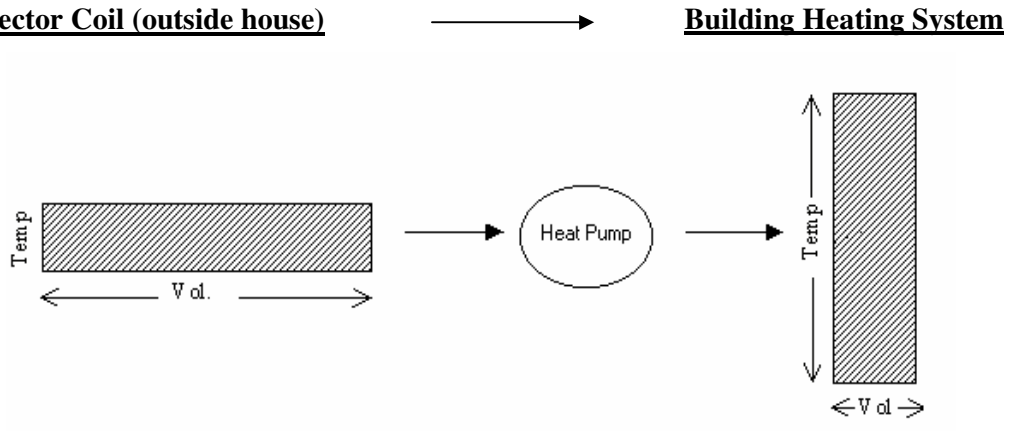
Geothermal Heat Pumps:

Frequently Asked Question's

HOW IT WORKS & WHERE THEY ARE USED

Q. How does the Heat Pump system work?

The geothermal heat pump works the same way as a fridge. A fridge extracts heat from the food and air inside the fridge and dumps this heat (at a higher temperature) onto a radiator at the back of the fridge.
Heat pumps extract heat from a relatively low temperature area (the ground outside your building or the air outside) via a collector. There is a compressor within the heat pump, which raises the temperature of the extracted heat. Essentially, the heat pump takes a large volume of low temperature heat and converts it to a smaller volume of higher temperature heat. This higher temperature is used for radiators (Aluminium or fan coil) or underfloor heating. See the diagram below.



Q. Do I need a back up of oil or gas for my heating system?

NO, if the heat pump is sized correctly then it will provide ALL your space heating requirements and heat the hot water to 40°C at a low cost. This cost is much lower than the equivalent cost with oil but solar water heaters provide the cheapest means of heating water.

SIZING AND PRICING

Q. What are the running costs for a geothermal heat pump?

Running costs depend on many variables, the size and type of the installation, the amount of night rate electricity used, but a general guideline is that geothermal heat pumps cost 30-35% of that of oil. Therefore if the annual cost of heating a building with oil is €1,000 then the typical equivalent cost with geothermal could be €350.

Q. How do I get a quotation?

In order to get a free quotation, please send a copy of your floor plans, site plans, elevations and all your contact details to Pure Energy. Please indicate what products you are interested in, i.e. solar water heaters, geothermal heatpump, underfloor heating or radiators etc.

Q. What is the lifespan of a geothermal heat pump system?

A geothermal heating system has three main sections: the collector outside, the heatpump unit and buffer tank. The collector once it has been installed properly has an indefinite life span as the pipe work underground is well protected and any connections are at the manifold, which is located in a manhole that can easily be accessed and maintained.

The heat pump unit has a similar lifespan to that of an oil boiler. However, the only moving part is the compressor, this is the only component likely to need replacement. When we refer to lifespan of a heat pump we really mean life span of the compressor. The expected life of the compressor is 15-20 years and the replacement cost of the compressor is only a fraction (typically 10%) of the initial full system costs. Life span is extended by use of the buffer tank.

Q. How does it work with the night-rate electricity?

Our system is designed to maximise the utilisation of cheaper night rate electricity. Night rate is 60% cheaper than day rate electricity. A Kilowatt hour (KWH) of energy costs 6.5c from oil, 2.8c from geothermal by day and 1.6c from geothermal by night. It can be seen that the savings using geothermal can be significant. (Note, pricing may vary from time of print due to energy price increases)

INSTALLATION QUESTIONS

Q. How long does it take to install a heatpump system?

The heat pump can take three to eight man-days to install. The work is done over several visits to the site at various stages of the site developments. The heat pump is usually fitted and commissioned after the electricity has been connected. Near the completion of the building, when the heatpump has been running and the house has been dried out Pure Energy return to do the final system checks and to optimise the efficiency of the heating system.

Q. At what stage of the site development does Pure Energy need to get involved?

We can install geothermal pumps at any stage of the site development, but it is far better (and usually cheaper) if we are involved from a very early stage. This allows us to explain to the builder, plumber, and electrician, components that are more easily installed at first fix electrical and plumbing and also allows for a more suitable time structure for installation of collector /heat pump.

Q. Are horizontal ground collectors the only option for collecting heat?

No, there are a wide variety of options where heat can be collected. These are:
(i) Vertical collectors: which involves drilling holes vertically into the ground and extracting heat from deep down.
(ii) Water collectors: lakes or rivers provide very good heat sources, therefore collectors can be placed into a river or lake assuming there is a sufficient water level throughout the year.
(iii) Air to water: It is also possible to use ambient air temperature to collect heat. This system works in a similar manner to geothermal heatpumps except heat is extracted from the air as opposed to the ground. This is very suitable to Irish conditions due to our moderate winter temperatures.

Q. How do I know which type of collector is best suited to my needs.

There are a number of variables to consider this depends on the soil type on the site, and the size of available area suitable for a horizontal collector. By contacting Pure Energy and sending us the site map, house plans and elevations, we will advise you on the best option for your house.

Q. What size site does the horizontal collector need to be?

The size of the collector depends on the size of the heatpump, which in turn depends on the size of the house and how well the house is insulated. The average collector would range in size from 20m x 20m to 20m x 35m. Pure Energy will size the collector for you.

Q. Can existing houses be fitted with heatpumps?

Yes, heat pumps can be fitted to an existing house with either air-to-water heat pumps or geothermal heat pumps. If the existing house has mild steel radiators then the use of Aluminium or fan coil radiators should be considered as this work more efficiently with heat pumps.