FINN GEOTHERM

The renewable heating experts

For industrial, agricultural, commercial and public sector estates and buildings of all sizes

Finn Geotherm specialises in heat pumps.

We supply and install the market leading Lämpöässä ground source heat pumps and Dimplex Renewables air source heat pumps to commercial, industrial, agricultural and public sector organisations across the country. We are an award-winning company with more than 10 years' experience solely in heat pumps.

We help businesses reduce their energy costs, improve their environmental credentials and aid ISO14001 accreditation. Through the government's Commercial Renewable Heat Incentive (RHI), our customers can also turn energy from a cost into an income stream for 20 years (see page 7).

Heat pumps are ideally suited to a huge range of premises, new build and retro-fit, including:

- Office buildings
- Commercial premises
- District heating
- Warehouses
- Large and small retail premises
- Business parks
- Schools
- Hospitals
- Public sector estates
- Stately homes and estates
- Tourist attractions
- Glasshouses
- Agricultural buildings, storage and drying sheds

So find out more about the best system for you and why renewable heating from Finn Geotherm can have a beneficial effect on your bottom line.

CARBON TRUST

Constructionline


Dimplex


GRUNDFOS

Reduce your heating costs and gain an income stream

- Save on energy bills, whether you use gas, oil, electricity or LPG, and benefit your bottom line
- Future proof your energy bills
- Earn an income through commercial RHI
- Lower maintenance on your heating and hot water system
- Long lasting – up to 30 years
- Environmental benefits – lower CO2, helps ISO14001 accreditation
- Contribute to your Corporate Social Responsibility

Reduce and future proof your heating bills

Heat pumps from Finn Geotherm can reduce heating costs by up to 50% and protect your property and business from the fluctuations of global energy prices, because a heat pump uses a lot less energy than an average gas or oil boiler to produce the same amount of heat.

Get paid to switch

By installing a heat pump system, you will qualify for the commercial Renewable Heat Incentive (RHI). This will provide payments for 20 years on a quarterly basis and is RPI linked – turning heating from a cost to a significant revenue stream.

New build and retro-fit

Heat pumps are suitable both for new build and for retro-fit for any size of building or estate.

By planning heat pumps into the design of new buildings, they can become cheaper to run, reducing overheads, as well as help to achieve high BREEAM ratings, achieve higher rents and help gain environmental standards, such as ISO14001.

Use the space around your buildings

The collector loop of a ground source heat pump is installed approximately 1.2 metres underground. Air source heat pumps are installed outside and are a space saving and cheaper alternative for smaller buildings.

Hot water on demand

Heat pumps generate plenty of hot water as it is required, meeting the demands of busy buildings which are often constantly in use.

Increased safety of low temperature radiators

Heat pumps are at their most efficient when providing steady state heat at a lower flow temperature. This makes them an ideal solution for low temperature radiators or underfloor heating in environments where safety is paramount, without compromising on the heat output.

Long term reliability

As a heat pump does not involve any form of combustion, it should be expected to last much longer than a traditional boiler and will require less maintenance. We would expect an air source heat pump to last between 15 and 20 years. A Lämpöässä ground source system should last more than 30 years.

Protect the environment

Heat pumps generate fewer CO2 emissions than conventional heating systems and also some other renewable alternatives. A ground or air source heat pump can also contribute to ISO14001 environmental accreditation and help towards carbon offsetting your business or establishment.

Your renewable heating options

Heat pumps are suitable for both new build and for retro-fitting to replace existing boilers.

We supply two types of renewable heating: ground source heat pumps and air source heat pumps. Both work by taking energy from the ground or air around you and process this through the heat pump to provide hot water for your radiators or underfloor heating, and hot water taps.

For ground source heating, a collector loop is installed underground outside the building. For air source heating a discreet heat pump is installed outside, usually at the side or rear of the building.

Every installation is different, so talk to us about your requirements and we will design the heat pump system which will work best for your premises and save you the most money.

The Commercial Renewable Heat Incentive (RHI)

The non-domestic or Commercial RHI is the government incentive, which provides cash payments as a reward for switching to a more environmentally friendly heating option.

Choose renewable heating for your property and you'll be entitled up to 20 years of quarterly payments for the amount of clean, green heat produced. Payments are RPI linked and mean that your heating system can actually become a generous income stream – an added benefit while you and your premises continue to enjoy hassle free heating and copious amounts of hot water.

Our systems offer a great return on investment and usually pay back within around five years.

RHI
Renewable Heat Incentive

Ground Source Heat Pumps

How they work

A ground source heat pump consists of four elements:

1. The collector loop
2. The heat exchanger
3. The compressor
4. The thermal store

1. The collector loop is placed under the ground in a parallel array similar to an underfloor heating system, or via a vertical bore. A mixture of water and antifreeze is pumped through this. As the liquid flows through the underground pipes, it picks up the temperature of the earth around it, typically returning to the heat pump at about 6°C. This temperature remains fairly constant throughout the year, which is why ground source heat pumps provide such an efficient means of heating, even during very cold winter conditions.

2. Once back at the heat pump, the liquid is passed against a heat exchanger. On the other side of the heat exchanger is a refrigerant. This refrigerant boils at -24°C, so 6°C is plenty to make it boil rigorously.

3. The now gaseous refrigerant is squashed back down using a compressor. Whenever you squash a gas you force it to release energy.

4. The released energy is passed into a thermal store – which is a large body of stored water, causing the water to get hotter. The cycle of collector loop, heat exchange, compression and energy release continues until the water in the thermal store hits the temperature required to heat your radiators and hot water. The cycle then stops until the temperature of the thermal store falls and needs recharging again.

Studies show that approximately 70% of the energy produced from a heat pump comes from underground. Lämpöässä systems maximise this, as they are monovalent – i.e. they use the heat pump (rather than a separate immersion heater) to provide all of the hot tap water and radiator heat. A well installed Lämpöässä heat pump will typically generate 4kW of heat for every 1kW of electricity that it uses. The ratio of heat to electricity is called the coefficient of performance, or COP. The COP is the standard measure that is used to describe the efficiency of a heat pump.

Key benefits:

- Can be used for heating and hot water production
- Provides good levels of efficiency all year round
- Lasts three times as long as a conventional boiler
- Designed to be low maintenance
- Nothing visible from the outside of the property
- Suitable for heating more than one building

Air Source Heat Pumps

How they work

An air source heat pump works in much the same way as a ground source, but extracts background heat from the ambient air temperature, instead of from the earth.

Air is pulled over a series of fine coils by a finely balanced fan unit. The coils contain a liquid refrigerant which absorbs the heat from the air. The refrigerant boils at -24°C so even if the outside air is -10°C, it is still "warm" enough to make the refrigerant boil.

The gaseous refrigerant is squashed using a compressor. Squashing the vaporised refrigerant forces it to get hot – up to 100°C.

This "hot gas" is then used to heat water, via a heat exchanger. The water is part of a tank contained in a thermal store.

The air source heat pump continues to work in this way until the water in the thermal store hits the temperature required to heat your radiators and hot water. The fan unit will then switch off until the temperature of the thermal store falls and needs recharging again.

The efficiency of an air source heat pump varies as the outside temperature changes. The Dimplex A Class air source heat pump can however still provide enough heat and hot water for your building down to -15°C outside. During the summer months, it might produce 5kW of heat (for hot water) for every 1kW of electricity. During the coldest winter periods, this efficiency might drop to 2:1. Overall, however, we would expect that the system would achieve an average of about 3.5 times as much energy out as you put in. This means that it has an average COP (otherwise known as a Seasonal Performance Factor or SPF) of 3.5.

Key benefits:

- No requirement for ground works in order to be installed
- Minimal space required
- Can be used for heating and hot water production
- Provides good levels of efficiency all year round
- Lasts twice as long as a conventional boiler
- Designed to be low maintenance
- Ideal for smaller buildings and individual properties.

Case study

Flagship Group, Norfolk

Finn Geotherm installed the first district heating scheme in the East of England for housing provider Flagship Group.

The ground source heat pump is delivering domestic heating and hot water for 30 flats at Orchard Close in Watton, South Norfolk. It will cut Flagship customers' heating bills by two thirds, creating annual savings of hundreds of pounds.

The project was undertaken as part of Flagship's Wellbeing Plan for continual improvement in energy use and carbon emissions. The scheme was needed to replace existing electric economy 7 storage heaters, which were inefficient and expensive to run.

Finn Geotherm specified two Lämpöässä Eli 60 60kW ground source heat pumps linked to a 2000 litre thermal store, with all equipment located within an external plant room. Facilities management company Aaron Services installed the radiators and accompanying equipment.

The system runs off a central heat pump, with each flat having its own hot water radiator circuit and hot water tank. A separate heat meter is installed in every flat so the tenant is charged for the heat they use. Separate Ofgem heat meters in the plant room facilitate the required RHI meter readings.

By operating twin heat pumps with a thermal store, the system will continually deliver heating and hot water even during maintenance. The external plant room enables servicing to be done without disturbing tenants.

Each stage of the installation was undertaken with utmost care and created minimal disruption for tenants. Groundworks saw individual block paving stones and grass turf lifted and meticulously re-laid after works were completed. No flat was without heating or hot water during the project.

Matt Smith, Contracts Manager at Flagship, said: "I can't speak highly enough of the heat pump system and the service we received from Finn Geotherm."

The flats can now be fully heated without big bills, delivering associated benefits such as positive impact on health by reduction in damp and improved air quality.

Stuart Longbottom, Strategic Director for Asset Management at Flagship, explained: "We are committed to continually improving our renewable energy sources to help tackle fuel poverty and reduce our carbon footprint, and this ground source system does that."

RAGT Seeds, Cambridgeshire

A landmark 350kW installation for leading European agricultural plant breeder RAGT Seeds, which delivers heat and passive cooling with significant energy savings.

RAGT's initial brief was to reduce heating costs for six glasshouses used for developing new crops, replacing an expensive, ineffective and over-worked LPG system. RAGT needed a new system to work with its existing grow tubes.

Finn Geotherm installed three Lämpöässä T120 ground source heat pumps, controlled using a Trend building management system.

A bespoke passive cooling system was also installed which utilises the new system to deliver air circulation and cooling without impacting on the RHI. Air at ambient ground temperature is circulated from the ground loop through 24 Jaga AVS fan coil units to deliver a constant temperature for crops to thrive in during the summer. Along with better regulated temperatures, RAGT is also enjoying enhanced plant growth and expects to reduce chemical inputs.

Award-winner! Non-Domestic Ground Source Project of the Year – National ACR & Heat Pump Awards 2017

Jack in the Box Nursery, Norfolk

A day nursery is ensuring constant warm rooms for its children at reduced energy bills.

Finn Geotherm specified and installed a Dimplex A16 air source heat pump as part of the construction of the new purpose-built Jack in the Box nursery.

Underfloor heating was a key consideration for this project to ensure the children could play comfortably on the floor throughout the day. Maintaining constant temperatures all year round were also important for the play and sleep rooms. The system cost effectively provides all the nursery's heating and hot water, while qualifying for the RHI.

The Installation Process

Our aim is to provide our customers with a speedy, trouble free installation with minimum or no downtime.

Our installation process, from initial enquiry through to completion, is:

1. CONSULTATION
To identify your requirements.

2. SURVEY AND ASSESSMENT
To survey your property and identify the most appropriate heat pump system to suit your requirements and calculate installation costs.

3. PROPOSAL
A presentation of the proposed installation, lead time, expected running costs and RHI payments.

4. INSTALLATION
Following signing of contracts, our professional team will carry out the installation.

5. COMPLETION
The start of reduced heating costs and RHI payments.

A trusted pair of hands

It's important to trust your heating system to a company with demonstrable skills and experience. We are one of the UK's longest established renewable heating companies and are award-winning experts in the design and installation of ground and air source heat pumps. We can offer a complete turnkey solution to make installing heating easy and hassle-free.

Finn Geotherm is also accredited by Constructionline and The Carbon Trust.

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