Fully-packaged ground source heat pumps.
Designed specifically for the poultry industry.
Developed specifically for the poultry industry.
GeoCube is a fully-packaged ground source heat pump system that provides controlled, energy efficient heating and cooling for poultry houses.

Utilising energy stored in the ground or from surface water (lakes or rivers), GeoCube provides sustainable heating and cooling for energy efficient climate control of your poultry unit – all year round.

Generating up to four times the heat output for every unit of electricity input, GeoCube is extremely energy efficient and enables your site to benefit from lower energy bills and reduced carbon emissions.

Heat pump systems have been used to provide sustainable energy to homes and commercial buildings for over 60 years, but have only recently been recognised as one of the most efficient ways to heat and cool poultry sheds.

With the technology qualifying under the Government’s Renewable Heat Incentive (RHI) scheme, they also offer an attractive return on investment of around 4-5 years*.

GeoCube will deliver a superior level of controlled heating and cooling throughout your shed, compared to conventional systems.

By using a more constant, lower grade heat, the air temperature is less volatile and more evenly spread throughout the building, helping reduce levels of moisture, improve the internal environment and ultimately increase productivity.

*Based on a 1.2 MW system, using 30,000m ground collectors.
1. A cold water anti-freeze mix is pumped around energy-absorbing pipes in the ground and it increases in temperature.

2. The water then passes into one side of an evaporator heat exchanger. On the other side is a cold, low pressure refrigerant liquid.

3. As the refrigerant and water both pass through the evaporator’s coils (remaining separate), heat energy from the water passes to the refrigerant. This causes the refrigerant to increase in temperature, and, due to its low boiling temperature, change to a gas.

4. The refrigerant gas then enters the compressor, where its temperature increases as a result of the compression process (much like a bicycle pump heats up during its use).
5. The hot refrigerant gas then passes to another heat exchanger – the condenser - and heat is transferred from the refrigerant to water on the other side. This high temperature water is passed to the building’s heating circuit for use in hot water or space heating systems.

6. As the temperature of the refrigerant decreases, it is passed through an expansion valve where the gas changes its state back to a cold liquid.

7. The refrigerant returns to the evaporator once again to be heated by water from the ground pipes.

8. This process is repeated to provide a constant temperature to the building.

GeoCube is a fully-packaged ground source heat pump system that produces controlled, energy efficient heating and cooling for poultry houses.
Energy efficient heating

For every kilowatt of electricity GeoCube utilises for power, it generates up to four times the amount of heat. It is this high level of energy efficiency that gives you low operating costs and reduced fuel bills - all year round.

GeoCube uses the latest refrigeration technology to absorb heat from the ground (or a water source), transfer it to a refrigerant and then raise it to a temperature suitable for space heating across your site.

Unlike air temperatures that fluctuate dependent on the seasons, ground temperatures are much more consistent, allowing GeoCube to provide efficient heating – all year round.

A GeoCube heat pump is classified as a low temperature heating system and can produce water temperatures as high as 55°C, making it sufficient to heat a poultry shed up to 34°C, (dependent on HVAC equipment). Like any heating system, it is most energy efficient when operating at lower temperatures. GeoCube is therefore most effective when combined with OptiRad, our bespoke, low temperature fan coil units, or VentMax, our climate control and ventilation system.

Because the design of your system will dictate its optimum efficiency, IPT’s expert team will undertake extensive thermal modelling and spend time understanding any existing systems to accurately size and configure the best solution.
An efficient and accurate cooling system is vital in poultry shed design to maintain bird growth and welfare. GeoCube can operate as a reversible heat pump system that offers both passive and active cooling, delivering chilled water to cool sheds down to 18°C (depending on the HVAC installation).

Cooling is delivered into the shed and heat is removed using OptiRad or VentMax units, together with careful control through an underfloor system where possible. The system continuously controls air entering and leaving your shed, maintaining its temperature without the need for noisy fans or blowers. GeoCube rejects the unwanted heat into the ground where it is stored, ready for the next heating cycle, making future heating processes much more efficient, due to the higher ground temperatures.

**Sustainable cooling**

GeoCube delivers superior levels of controlled cooling throughout your poultry shed. It helps alleviate the need for disruptive tunnel ventilation systems in summer, improving bird welfare and ultimately increasing productivity.
Passive cooling

This is when excess heat is removed from the building and the heat pump transfers it back into the ground, using only its circulation pumps. Also known as natural cooling, it is the least energy intensive form of cooling, as the heat pump remains switched off.

Active cooling

For sustained periods of cooling, the heat pump will go into a reverse cycle, where compressors take the heat from the building and deliver chilled water with return temperatures as low as 7°C.

The heat rejection process of a heat pump is much more efficient than traditional air conditioning systems, because ground temperatures are consistently lower than the air.

Underfloor cooling

GeoCube in conjunction with an underfloor cooling system is particularly effective at taking heat away from poultry units, because the ‘heat-generating’ birds are close to the ground. Removing only a few degrees of heat will help reduce the microbial activity within the litter, and, consequently reduce ammonia and odour.
Our controls can be fully integrated with your own building management system, providing one tool to monitor and operate your facility.
Accurate temperature control

GeoCube works in tandem with your building’s HVAC system, providing continuous and consistent heating and cooling to ensure your shed’s house set point is always met.

Plant control
GeoCube has its own control system developed by IPT that will talk to your shed’s HVAC plant to understand the exact water delivery temperatures needed for maintaining the required house set point. It then automatically selects the most efficient and effective method of heating or cooling, unless you choose to manually override and programme the system locally.

Monitoring and optimisation
GeoCube’s intelligent monitoring and reporting capabilities offer a detailed analysis of water delivery temperatures, heating and cooling processes and the shed’s environment, giving you optimum visibility and control of your system.

We also offer a remote monitoring service where we provide minute by minute data uploads and quickly react to any system alerts, either remotely or with a site visit, to help keep your equipment operating at its peak efficiency and maximise its lifespan.
A cost-effective, sustainable heat source
GeoCube offers an extremely energy efficient way to produce heat – for every unit of electricity used to power the heat pump, it will generate up to four times the heat output.

Lower energy bills
Whilst GeoCube requires a small supply of electricity to function, it will produce most of its heat from the ground. This will provide savings of between 30-70% on your energy bills, when replacing conventional electric, oil or LPG gas heating.

Consistent, controlled temperatures
By combining GeoCube with one of our bespoke climate control systems (OptiRad or VentMax), and underfloor heating/cooling, it will deliver a superior level of temperature control throughout your shed, compared to conventional systems.

Reliable and low maintenance
GeoCube requires little maintenance as it is a sealed system with few moving or serviceable parts. Our system comes with an extended warranty* and each compressor has a life expectancy of 25-30 years and will deliver sustainable and reliable heating and cooling for the lifetime of the installation.

No fuel deliveries
Unlike oil, LPG or biomas heating, you will never need fuel deliveries to site – keeping your carbon footprint to a minimum. The need for fuel storage and the risk of theft are also removed.

Fully-packaged
GeoCube is a fully-packaged system with all equipment housed in a compact, purpose-built, fully-weatherproof, British-manufactured unit, that can be located in a convenient space on your site.

No plantroom is required; the units are built and tested at our factory, enabling a speedy, ‘plug-and-play’ installation and eliminating the need for a costly, labour-intensive onsite plant build.

*Subject to a full service and maintenance contract with IPT
Suitable for both large and small sites, GeoCube provides a wealth of benefits to help you cost-efficiently manage your heating and cooling.

**Improved bird welfare**
GeoCube provides passive and active cooling for our cooling plant (OptiRad or VentMax) and underfloor cooling system to effectively control the temperature of your shed. This reduces the need to trigger disruptive tunnel ventilation systems in hot weather, helps maintain feed conversion rates and ultimately improves bird welfare.

By improving your shed’s ventilation effectiveness, you can also improve the quality of your litter, removing the burden and cost of spreading additional bedding and reducing the risk of hock burn.

**RHI payback**
GeoCube offers an impressive 4-5 year payback period due to the Government’s Renewable Heat Incentive Scheme (RHI). Under the RHI scheme the Government will pay a tariff for every kilowatt hour (kW/h) of heat (and hot water) you produce.

RHI provides a genuine financial incentive to invest in energy efficient and greener technologies, paying a tariff based on the capacity of your ground source heat pump and the number of hours you heat your premises. Importantly, the tariff level is index-linked over the twenty years of its life.
About IPT

IPT designs, manufactures and installs innovative heating and cooling plant that solves real commercial challenges. Our product range continues to expand, with the GeoCube, VentMax and OptiRad systems all designed with the agricultural industry in mind. We have an enviable track record delivering commercial and agricultural design and build projects. From conception to completion, we make sure every project is on time and within budget.

Made in Britain

We design and manufacture all our products from our state-of-the-art production facility in Bromsgrove. Because our designers, production team and service engineers collaborate together on one site, we can deliver quality-engineered products, bespoke solutions and a seamless service.

Aftercare service

Once installed, our commitment to quality continues, with our comprehensive aftercare service programmes. These include a technical helpline, on call duty engineers, planned maintenance, remote system checks and performance reports.

IPT (IPT Technology Ltd) is part of the IET Group (Integrated Eco Technologies) which includes:

- **EcoAir Box**: fully packaged air handling units
- **ExCool**: market-leading advanced data centre cooling
- **Mercury Climatic Services**: full HVAC installation service.
All our products are designed and manufactured at our state-of-the-art production facility in the Midlands.