



GROUND SOURCE HEAT PUMPS IN COMMERCIAL BUILDINGS: THE ISLAY HOTEL, PORT ELLEN, ISLE OF ISLAY, SCOTLAND

Islay Hotel is thought to be the only hotel in Scotland reliant on ground source heat pumps for 100% of its heating and hot water.

The system collects ground heat using a closed loop, which runs through boreholes drilled 120m into broken rock, and converts this to usable heat with a 50KW Nibe Fighter 1330 heat pump.

Cost: c. £85,000 set up plus £550 p.a. maintenance contract

Renewable Heat Incentive Income: c. £6,000 annually over 20 years

THE BUILDING

The Islay Hotel was rebuilt by a partnership of local business people in 2010/11 after lying derelict for 20 years. Occupying a prime site in the busy hub village of Port Ellen, the hotel sits at the heart of the community, both physically and through a community shares scheme which allowed local people to invest in the redevelopment.

The boutique hotel has 13 bedrooms, along with a restaurant and bar, and sits in a relatively sheltered position overlooking the marina.

The lack of mains gas on the island means that many businesses rely heavily on oil and electricity for heating and hot water, but the owners of the hotel were keen to look at a greener alternative as part of their ethos of 'everyone doing their bit to tackle climate change'.



Did you know?

You don't need underfloor heating to make use of ground source heat pumps. Heat can be distributed via radiators, though these need to be slightly larger than those used in standard central heating systems.



Did you know?

Heat pumps can be fitted to existing buildings as well as new builds. As with any system, it's always good practice to make sure you have good levels of insulation in the building to ensure you get the maximum benefit.

THE INSTALLATION

After obtaining quotes for the installation of the system as a whole, the partners decided to split the work between several contractors in order to save money. They worked directly with a regional drilling company to drill seven boreholes (two per day), in the area which is now a beer garden.



The boreholes are located under the beer garden

The holes were drilled to a depth of 120m each, and the partners relied on the contractor's specialist knowledge to help them get the best from the area available.

Local contractors then worked to fit the external pipework, which allows the antifreeze solution to run through the boreholes and collect heat. The antifreeze then passes through a heat pump which extracts and compresses the low-level heat to bring it up to a useable temperature.

A specialist company undertook the installation of the heat pump and the fitting of the internal system which uses a 50kw Nibe Fighter 1330 and two accumulator tanks to supply all of the heating and hot water to the hotel.



The seven boreholes feed into a 50Kw Nibe heat pump

STRENGTHS AND CHALLENGES

Guests often comment on the consistent heat provided throughout the building and there have never been any issues with hot water availability, even during peak demand when the hotel is full and guests all want showers at the same time.

Some planning is required as it can take a day to fully adjust the temperature of the system, but this is a simple case of keeping an eye on weather forecast, which is just part of island life in general.



The heat pump provides heating and hot water throughout the building

As a hotel which attracts international guests, the fact that the heat cannot be instantly adjusted means that those coming from warmer climes occasionally request additional heating in their bedrooms, but this is not a frequent occurrence.

Operationally – there were some initial difficulties in balancing the system which meant that it was not running to its full capacity in the early stages. Once an engineer from Nibe visited to balance the system these teething problems were ironed out.

After damage to equipment from suspected power surges, a surge protector was installed to safeguard the system. Since then there has been one small mechanical failure within the system which was dealt with under warranty.



Learning points

- 1 Don't assume you have to use a single contractor for everything – in this instance it proved to be much more cost effective to split the project into three areas and work directly with individual specialists.
- 2 Make sure your pipe work is visible – you obviously won't want all your pipe work on show, but make sure the key elements are visible and easy to access for visual checks and diagnosing any issues.
- 3 You can pay someone to manage your Renewable Heat Incentive claims – if these things don't come naturally to you, consider if it would be more time / cost effective to hire a company to do this for you.
- 4 Insulation is key – there is little point in installing an efficient system in an inefficient building.

