

GROUND SOURCE HEAT PUMPS IN COMMUNITY BUILDINGS: **DUNAVERTY HALL, SOUTHEND, KINTYRE, SCOTLAND**

Dunaverty Hall

Dunaverty Community Hall houses the village Post Office along with a multipurpose sports hall / function space, meeting rooms and changing rooms.

A new ground source heat pump system was installed when the hall was rebuilt in 2015/6, supplying all of its heating and hot water needs.

The system collects ground heat using a closed loop in coils running through 5 trenches in the adjacent sports field and converts this to usable heat with a NIBE 1345 heat pump.

Cost: c. £50,000 to set up, plus £390 p.a. maintenance contract.

Renewable Heat Incentive income: c. £4,000 annually over 20 years.

THE BUILDING

Dunaverty Hall is popular social hub in the village of Southend, serving a community of around 450 people. It offers activities such as sports clubs, computer lessons and genealogy groups, as well as meeting rooms and a function space, and housing the community-run Post Office.

The hall has also been designated as an emergency hub for the community following storms in 2013 which saw the area without power for a week and cut off by snow. The hall was rebuilt in 2015/16 with funding from Sport Scotland; People and Communities Fund; Scottish and Southern Energy's community funding initiatives; and Scottish Power's Green Energy Fund.

The community were keen to find an efficient replacement for the ancient heating system in the original drill hall, which was powered by bottled gas. Conditioned floor area: 452 m2.

CHOOSING A SYSTEM

The lack of mains gas in the area means that many community spaces rely on electric systems for heating and hot water, but the hall committee were keen to look at a more efficient, low maintenance alternative which would help reduce their carbon foot print and allow them to earn income for the community under the Non Domestic Renewable Heat Incentive. Biomass was deemed not suitable due to the ongoing cost of fuel and the need to maintain the system and manage the supply of wood.

The committee considered using a 250m borehole as part of their chosen ground source heat pump system, but opted for trenches as their location adjacent to sports fields gave them easy access to suitable land.

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.

Interreg Atlantic Area
European Regional Development Fund
EUROPEAN UNION
geo Atlantic
Islay Energy Trust

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 SYSTEM

Five one-metre deep trenches were dug in playing fields adjacent to the hall by three members of the hall committee who then laid a 500m closed loop of 38mm pipe work and re-covered the area. The closed loop contains anti-freeze solution which collects heat from the ground.

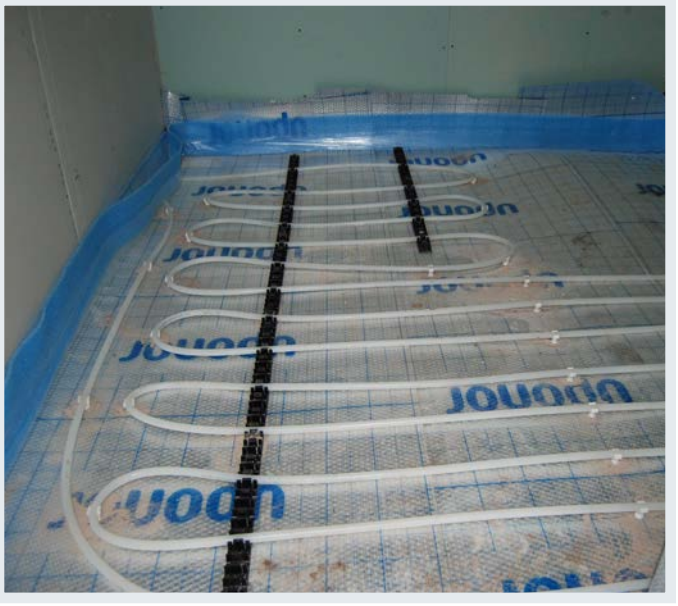
The antifreeze passes through a NIBE 1345 30kW heat pump to extract and compress this low level heat, and bring it to a usable temperature. The heat pump was installed by a specialist company who also installed the internal pipework, underfloor heating system and 6ft high water tank to serve the hall.



Dug out trench ready for pipes to be laid

The system allows the heating to be zoned to provide a suitable level of heat for the different spaces within the hall. Although easy to manage, the system takes around 24 hours to adjust temperature settings. The committee therefore chose to restrict access to the heating controls to a handful of people who understand this principle in order to avoid the system being altered incorrectly.

Installation was straight forward, with no issues, and took one tradesperson approximately 14 days to complete.



Internal underfloor heating pipework

THE CHALLENGES

Although the installation was straight forward, the committee relied on volunteers to register the system for the non-domestic renewable heat incentive. Their lack of specialist knowledge in this area meant that there was a delay in completing the registration and receiving income from the Renewable Heat Incentive, though these payments were backdated once the registration was complete.

THE IMPACT

As well as providing a consistent supply of heating and hot water for the building, the income from the Renewable Heat Incentive helps balance the building's running costs and has allowed the hall committee to keep room hire rates low in order to encourage people to continue to use this valuable local resource. The income received from the Renewable Heat Incentive currently exceeds the hall's electricity bills.

Learning points

1. Consider what land you have available to determine whether trenches or a borehole would be most suitable to serve your building.
2. Consider restricting access to your heating controls to people who understand how the basic system works in order to maintain an effective level of heating.
3. You can pay someone to manage your Renewable Heat Incentive claims – if you are not a specialist, consider if it would be more time / cost effective to hire a company to do this for you.
4. Consider a range of funding options for your project – the money you need might not all come from one source.