

Case Study 22: Gamblesby Ground Source Heat Pump



This case study forms part of **Community Action for Energy (CAfE)**, a major programme designed to promote and facilitate local community-based energy projects. CAfE is a programme from the **Energy Saving Trust**.

Gamblesby Ground Source Heat Pump

Introduction

When the village hall in Gamblesby, a small farming community near Penrith in Cumbria, was in dire need of renovation, local people decided to take the opportunity to incorporate renewable energy measures alongside energy efficiency improvements. A ground source heat pump, moving solar heat stored in the earth into the building via pipes buried underground, was found to be a viable option, providing an environmentally-friendly and cheap to run heating solution. Costs were kept to a minimum by the community doing much of the work themselves.

When?

Installation of the pump began in October 2003 and it became operational the following month.

Who was involved?

The main driving force behind the project was the 12-strong Gamblesby Village Hall Committee and the village's residents, who have almost single-handedly developed and pushed this project on with little outside intervention. CLAREN, part of the Countryside Agency's Community Renewables Initiative, provided renewable energy advice to the committee.

How was it funded?

The total cost of the renovation project was £42,016, made up as follows: North Pennines LEADER+ programme, a European Community-funded initiative for assisting rural communities in improving the quality of life and economic prosperity (40%); Northern Rock Foundation (26%); community fundraising initiatives and in-kind support (17%); Eden District Council (10%); Shell Better Britain Campaign (5%); and CLAREN (2%).

What were the targets and aims?

By incorporating renewable energy and energy efficiency measures, the committee aimed to:

- make the building warmer and so useable by the whole community as a place to meet and hold events
- provide a convenient, low-maintenance and low-cost heating solution
- capitalise on the funding streams available for 'green' projects
- create a sustainable building that had a lower impact on the environment.

How was it implemented?

The village hall, a 150-year-old stone building and Gamblesby's only remaining amenity, had been closed since 2000. Run down, cold, draughty and damp, its only heating had been from overhead electric heaters that tended to burn people's heads while leaving their feet frozen.

Renovation was desperately needed, but the hall's committee realised that, because of the fierce competition with similar organisations to secure funding, a unique factor would be needed to help ensure that renovation costs would be met. They therefore decided that, by making the building as environmentally-friendly as possible and using natural, locally-sourced materials, they would gain an edge. This strategy helped secure a variety of grants, in addition to which the villagers' own fundraising activities, such as garden open days, auctions and carol singing, were very successful.

The committee approached CLAREN to help assess the building's potential for renewable energy. Ground source heating was chosen as the ideal option for several reasons: it was less expensive than solar photovoltaic panels; digging up the grounds to bury the pipework fitted in

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with plans to renovate the car park; and the underfloor heating that the pump would supply could be fitted at the same time as the renewal of the hall's rotting timber floor. They also decided to improve the building's energy efficiency by installing low-energy lighting and using locally-sourced sheep wool insulation for the walls and roof.

The project costs were kept to a minimum by villagers sourcing many of the materials and equipment and undertaking a large proportion of the work themselves, seeking technical advice where appropriate and available. This meant that some committee members had to master some of the specialist techniques relating to heat pump technology. In-kind support, such as local farmers giving their time and machinery to dig the trenches, was also crucial.

The pump's pipework was buried in two-metre deep trenches in the car park, leading to a small stone-built structure housing the heat exchanger, from which the underfloor heating was powered. The system became operational in November 2003 and, when more of the renovation work was completed a month later, the hall's reopening was marked by a celebration party. The maintenance requirements of the equipment are expected to be very low, likely to involve servicing of the pump just once or twice a year.

The local newspaper and village newsletter have carried several stories about the project and CLAREN is helping to publicise the project through talks, seminars and conferences across the region and nationally, as well as press releases, newsletters and case studies.

Achievements

- the heat pump has been emitting heat up to 40°C, far higher than originally expected
- the hall has reduced its electrical heating requirement from around 12kW (for the four electric bar heaters) to just 3kW (the pump's running requirement). This has meant that electricity bills and carbon dioxide emissions have been cut
- the hall's heat requirement is likely to be met almost totally from the heat pump – the original electric heaters have been retained just as a back-up
- the community now has a facility that is useable year-round
- local people, some of whom were previously indifferent about the environment, have become increasingly committed to and vocal about green issues. Some have expressed an interest in installing their own renewable energy systems.

“Village halls are traditionally cold, draughty and expensive to heat. By using ground source heating, we now have a warm and welcoming venue that will save us money and is good for the environment too! By adopting an innovative solution to a common problem, we have been able to access funding which would otherwise have been unavailable, and our scheme has influenced what other organisations are doing both within Cumbria and beyond.”

James Watson, one of the volunteer trustees



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Key success factors

- the commitment and enthusiasm of the local community helped ensure the scheme's success
- an innovative solution to a common problem meant that 83% of the funds could be obtained from grant sources, so only 17% of the costs had to be made up by the community in funding initiatives and in-kind support
- the process has been good fun and has genuinely brought the community together, including young and old, newcomers to the village and those who were locally born and bred.



Lessons learnt

- sustainability does not come cheap, but it can make a scheme that would otherwise be unattractive to funders a much more viable opportunity. A conventional refurbishment of the hall would have cost a comparatively modest £17,500, but would have been virtually impossible to fund
- retrospective funding arrangements can be a hurdle to small voluntary organisations. Gamblesby's biggest problem has been having to incur expense up front in order to access public funding. This particularly affects projects involving large items of capital expenditure, such as heat pumps or wind turbines.

Next steps

The second phase of the renovation, due to be completed in 2004, will involve rebuilding the hall's 1970s extension to include either solar photovoltaic panels or a small wind turbine to make use of the Helm Wind, a phenomenon unique to a small area of the north Pennines. It is hoped that the electricity produced will cover the requirements of the heat pump, making it a totally renewable energy source.

Further information

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