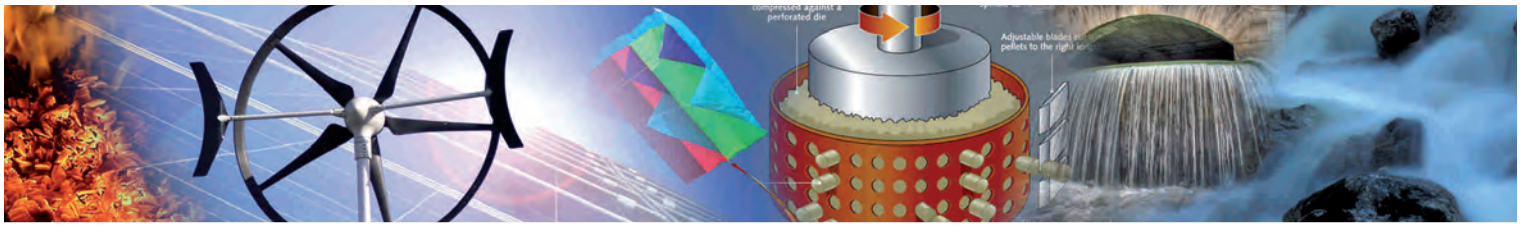


COMMUNITY RENEWABLE ENERGY AT LOCAL LEVEL

Whitfield Parish Hall

Whitfield Parish Hall in Whitfield was built around the turn of the last century and provides an increasingly important focus for village life. As part of a recent and ambitious plan for renovation it was decided to make the building as environmentally and economically sustainable as possible.

REALL provided advice on energy conservation and the various options available for the hall to generate its own power.

After consultation it was decided that the project should include a ground sourced heat pump and a micro-hydro generator, the latter harnessing power from the nearby West Allen River, and utilising an historic mill race which runs below ground immediately adjacent to the hall.

REALL also helped the parish hall committee secure support from the University of Newcastle and, under a Northumberland Strategic Partnership funded scheme, a £14,000 grant to support the reinstating of the micro-hydro scheme.

Ground sourced heat pumps are a more efficient method of using electricity to warm a building than conventional electric heaters. They are 300-400% efficient, using only one unit of electricity to produce three to four units of heat (a high-efficiency gas fired condensing boiler is 80 to 90% efficient). At Whitfield a 130 metre deep borehole was sunk and a loop of piping dropped in. This piping carries a water and anti-freeze mix, which is warmed by the surrounding earth. The heat pump transfers this warmth to the building's central heating system.

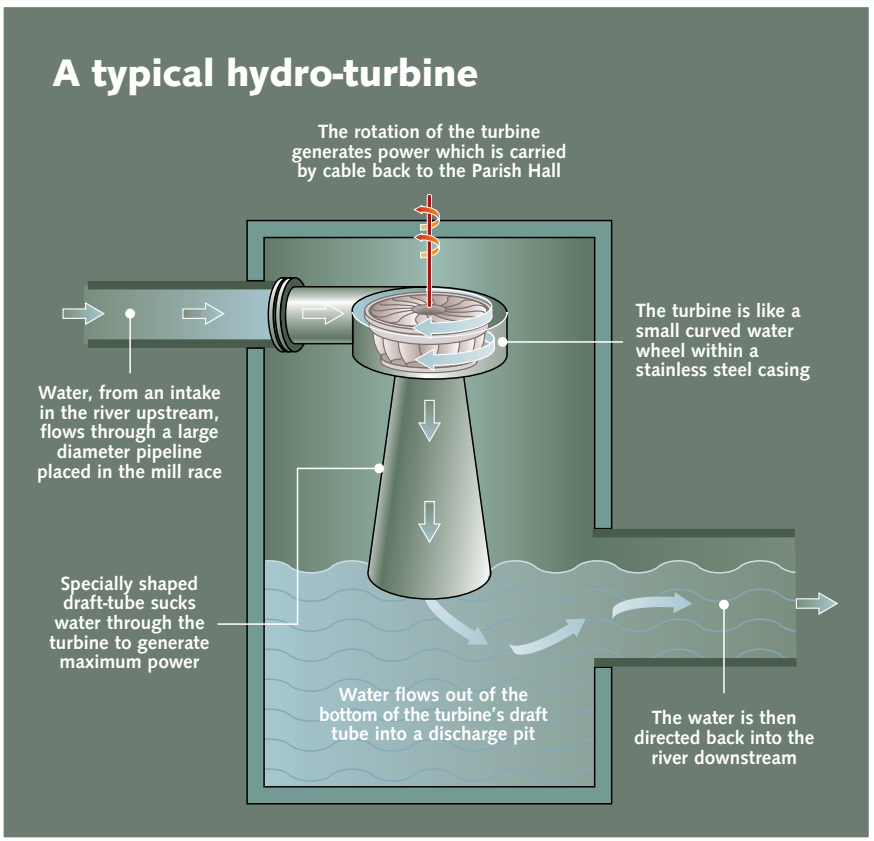
At Whitfield, free electricity generated by the hydroelectric turbine is used with maximum possible effect, by supplying power to the heat pump system which generates three to four kilowatts of heat for every unit of electricity consumed.

The hydro system uses an old millrace to channel water from the river through the turbine and back into the river. There are several shapes of turbine runner (the part of the turbine that carries the water). The most common is the Francis turbine - named after the American engineer James Francis, who developed it - and this is the type installed at Whitfield. Francis turbines are radial-flow turbines, meaning that the water is channelled inwards towards the centre of the turbine and over the blades, which ensures the rotation necessary to produce electricity.

Initial feasibility studies were carried out in partnership with REALL (Renewable Energy at Local Level), by Newcastle University and RC Engineering Solutions. The ground sourced heat pump is a Kensa unit, installed by Geowarmth at a cost of around £12,000. Of this, half was to sink the borehole. The Nautilus hydro turbine was installed by Turbine Services. The turbine, installation and civil works came to just over £45,000. All of the work at Whitfield has been fully grant aided

A ground sourced heat pump of this size will save, on average, 1,626kgs of CO_2 emissions, compared to heating with oil, but only 926kgs compared to gas, if powered by mains electricity. In addition, the 3kW hydro electric system at Whitfield is expected to generate around 25 megawatt hours of electricity every year, which will save 10,750kgs of CO_2, make the building carbon neutral and produce a surplus which can be sold to a renewable electricity supplier via the National Grid.

A typical hydro-turbine



CLEAN GREEN TECHNOLOGIES

Solar water heating

Over a year, solar water heating can provide about 60% of a typical family's hot water.

Solar photovoltaics

PV panels generate electricity from the sun, produce no CO_2 and are maintenance free.

Wood heating

Heating with wood is carbon neutral as growing trees lock up the CO_2 emitted by burning them.

Micro wind power

In an open location wind turbines make a useful contribution to electricity supply.

Hydro power

For buildings near a river, hydro can generate power with no pollution.

Ground sourced heat pumps

Heat from the ground for underfloor heating or extra large radiators. Uses electricity efficiently.

Funding for renewables and energy efficiency

There are various funding sources for renewable energy and energy efficiency at both local and national level. Advice on funding is available from your local rural community council:

Communty Action Northumberland
Tower Buildings, 9 Oldgate, Morpeth
Northumberland NE61 1PY

Durham Rural Community Council
Park House, Station Road, Lanchester
Durham DH7 0EX

Tees Valley Rural Community Council
Queensway House, Queensway
Middlesbrough TS3 8TF

Further information

Further information about community ownership of renewable projects is available from the **Department of Trade and Industry**. www.dti.gov.uk/files/file15108.pdf.

Information about energy co-operatives - **Energy4All**
Tel: 01229 821028, Email:info@energy4all.co.uk
and web: www.energy4all.co.uk

Information about energy matters for communities may be obtained from **Café**.
Community Helpline 08701 261444, email café@est.org.uk and web www.est.org.uk/cafe

Small scale renewables may be seen on the **Tynedale Renewable Energy Trail** and there is an exhibition at Kielder Castle, open from Easter to October. www.tynedalerenewableenergy.org.uk

REALL was run by Community Action Northumberland and Durham Rural Community Council and operated in conjunction with partners. Funding has now come to an end, and Community Action Northumberland can no longer supply specialist renewable energy advice, although Community Action field workers are able to offer general guidance.

Funding for **REALL** was received from:

Community Action Northumberland
one NorthEast
Celebrating 10 years of local action 21 County Durham
Northumberland Coast Area of Outstanding Natural Beauty
Durham Rural Community Council
North Energy
Natural England
Northumberland National Park Authority Sustainable Development Fund

The **SEED** Programme
Community Renewables Initiative
PB Power and **RC Engineering**