

Sustainable technologies for eco-tourism



The installation of sustainable technologies at Whitelee Farm was part of a larger expansion of an existing holiday cottage complex into eco-tourism. The holiday cottages are now powered by a wind turbine and photovoltaic (electricity producing) panels, heated by a ground sourced heat pump and have hot water provided by solar heated water panels. These installations not only reduce fuel and power costs considerably, but reduce emissions of carbon dioxide and other greenhouse gases.

How does it work?

The 2.5kW Proven wind turbine is a "down-wind" turbine, meaning that it turns so that the wind blows from behind the blades. The triangular vane at the top of the tower ensures that the turbine is always in the optimal position to produce maximum electricity. As the wind passes over the blades, it causes them to rotate. As they do so, they turn a generator which produces electricity.

There are two different types of solar panels installed at Whitelee Farm. The Photovoltaic (PV) panels are Isofoton, with each set of six capable of producing 660W of electricity. Power is generated when daylight falling on the panels causes a reaction within them. The PV panels are the ones that appear dark blue. The other panels, or solar collectors, are designed to warm water. When sunlight falls on these panels it heats a mix of water and antifreeze inside them, which passes through heating coils in a well-insulated hot water tank to heat the water inside.

The ground source heat pumps are a 10kW and an 8kW twin compressor Kensa. One hundred metres of pipe, which carry a water and antifreeze mix, are buried in a field. As the liquid flows through the pipe, it is warmed by the surrounding ground, which maintains a constant temperature throughout the year of about 8-10°C. Heat is then extracted from the liquid in this loop and transferred to the central heating systems in the cottages.

Installation and costs

The overall cost for installing the renewable energy equipment was £54,000. This was made up of £14,000 for the ground sourced heat pump system, plus £2,000 for trenching, £8,000 for the wind turbine, £11,000 for the PV panels, £9,000 for controls, £8,000 for the solar heated water system and £2,000 for cabling. In addition, the mains electricity supply had to be upgraded to allow for the starting current of the ground source heat pumps, which cost £7,500. The business was able to obtain funding from Energy for Enterprise and the Northumberland National Park Authority's Sustainable Development Fund,

which covered almost the entire cost of the installations. At 2007 prices, it is estimated that the business saves £1,500 on heating fuel and electricity through these technologies.

Environmental impact

The combined systems at Whitelee Farm save approximately 8,000kg of carbon dioxide each year.

Further information

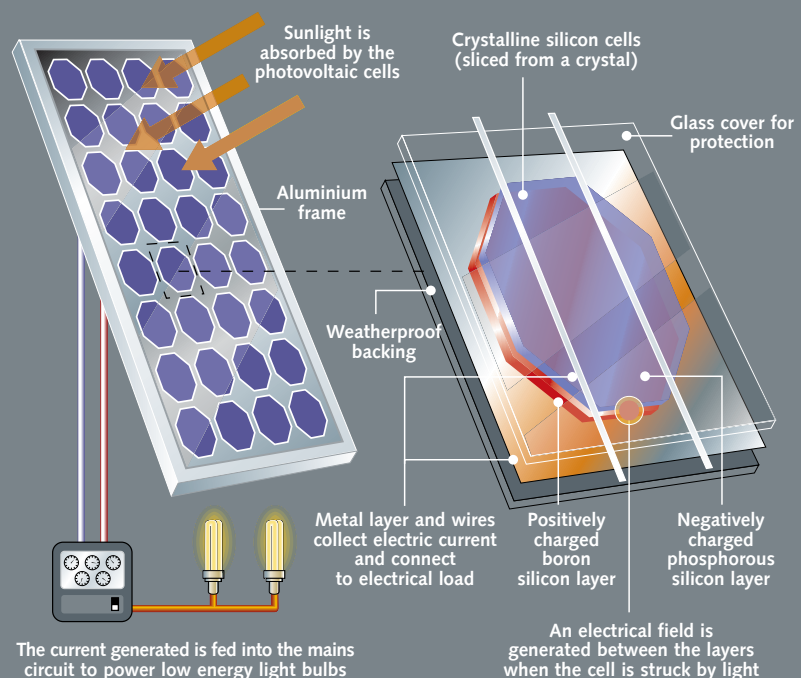
Visit the other renewable energy sites shown on the map overleaf.

Kielder Castle renewable energy exhibition is open from Easter to October.

www.tynedalerenewableenergy.org.uk
www.whiteleeholidaycottages.com
 or 01830 520530
www.winsund.com or 01207 255365
www.geowarmth.co.uk or 01434 674111
www.seconsolar.com or 0191 5166554

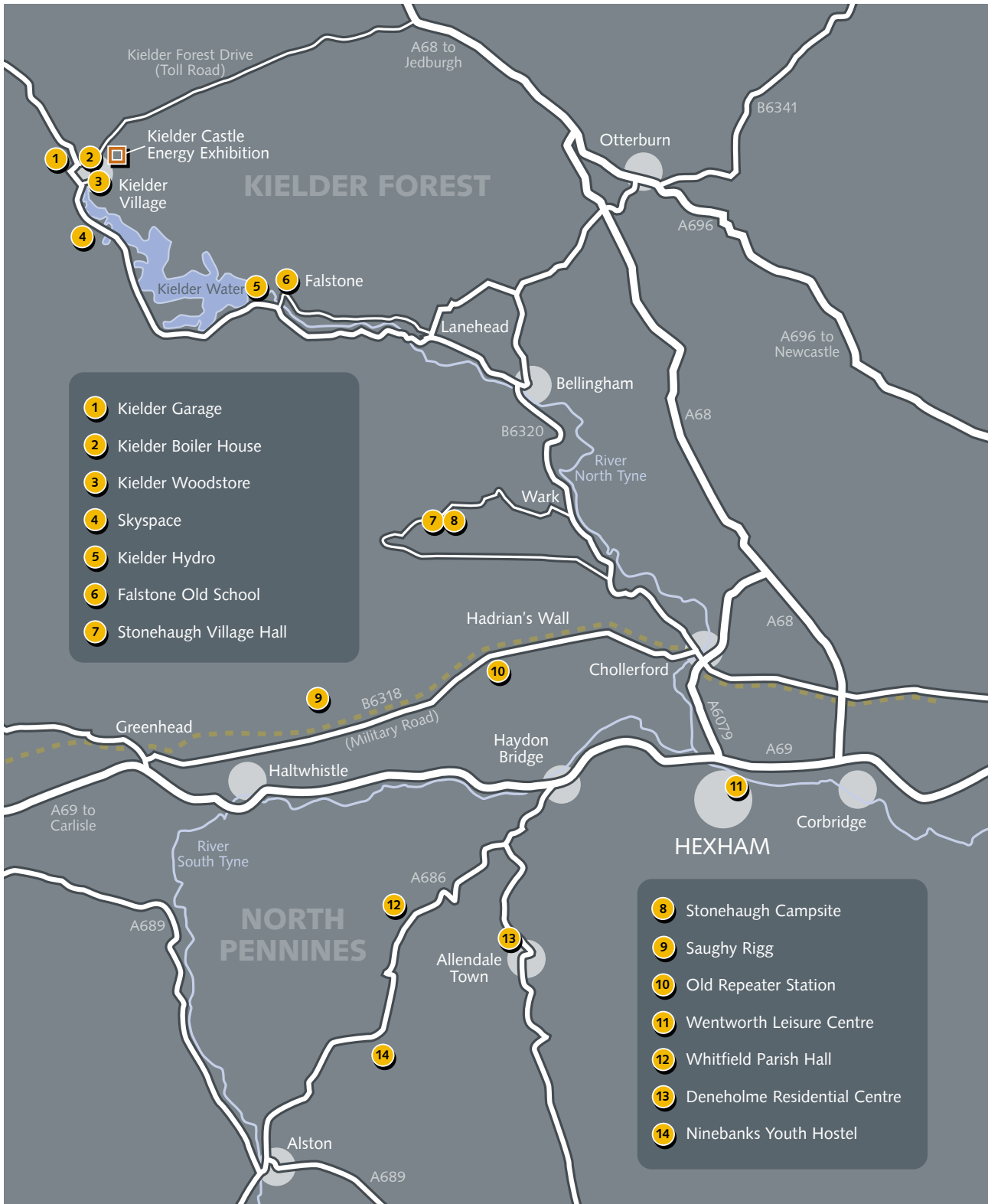
Please note that this site is not usually open to the public, and does not have an information board. However, occasional viewings may be possible if arranged in advance.

A typical photovoltaic panel





Tynedale Renewable Energy Trail



The Tynedale Renewable Energy Trail and Exhibition show renewable energy providing energy for individual buildings and producing larger amounts of power for the National Grid. Organisations in Tynedale are benefiting daily from green energy and are helping to avoid further climate change by doing so. Why not visit some of the sites and see how to do it too?

Further information on using renewable energy and on the Tynedale Renewable Energy Trail can be found on :

www.tynedalerenewableenergy.org.uk.

The Tynedale Renewable Energy Trail was co-ordinated by North Energy (www.northenergy.co.uk) and North East Community Forests with design by Iain Kerr Associates.

Funding for these case studies has been provided by:



Tynedale
COUNCIL

