Forms of renewable energy for the Cotswolds AONB:

Heat pumps

The Cotswolds Conservation Board is the body responsible for co-ordinating the management of the Cotswolds Area of Outstanding Natural Beauty (AONB).

The Board believes that there is considerable scope for the generation of renewable energy by householders and businesses in the AONB without harming the beauty of the landscape or traditional buildings.

This leaflet is one of a series providing information about a number of renewable energy technologies which are suitable for the Cotswold landscape.* Consideration should be given to using more than one such technology in an integrated way to maximise the potential for renewable energy generation at a particular site or building.

The Board encourages everyone to reduce energy use by making their home or office energy efficient, particularly when planning for new buildings or conversions of existing buildings.

Installation of a ground collector

* The other leaflets in the series cover solar photovoltaics, solar water heating, biomass, micro-hydropower, and small scale wind power.

HEAT PUMPS

Key points

- Provide a reliable, steady, continuous source of heat
- Extract heat from water bodies or the ground to produce space heating and hot water
- The amount of greenhouse gases produced to provide hot water and space heating are reduced compared to a fossil fuel system
- Can be fitted into existing or new buildings
- Well proven technology
- Negligible visual impact
- Most effective with low temperature under floor heating
- Can be used in reverse for cooling
- Ideal for integration with a renewable electricity generation system

How does it work?

Soil and water bodies absorb heat from the sun and remain at a predictable and steady temperature throughout the year.

Pipes are buried in the ground or sunk in water bodies and a liquid pumped through them. This extracts the natural heat from the ground. When the liquid is compressed by the pump the heat is concentrated and can then be used to heat water.

The heat is usually collected from the ground using a horizontal ground loop or a water source loop collector. Where space is restricted, a vertical borehole can be used, but this is more expensive to install. The pump itself looks like a conventional gas boiler, and for domestic situations is of similar size.

The collection pipes have no moving parts and require no maintenance.

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How much heat can be generated?

A system providing between 4 and 8 kW would be required for a typical house in the Cotswolds. Such a system is particularly suitable for new housing on sites which are not on mains gas, as the running costs are lower than for other fossil fuels.

Heat pump schemes can be designed to meet the heating and hot water requirements of any size of building, provided there is space to install the collector.

Why are heat pumps suitable for the Cotswolds AONB?

The ground and water collectors are buried and therefore have no visual impact. The pumps themselves are within buildings and have no visual impact.

The open, rural setting of many buildings within the Cotswolds AONB means that there will often be adequate space for the installation of the horizontal collector pipes in domestic properties, community and industrial buildings. There may be archaeological constraints in excavating trenches to install the collectors.

The use of a renewable energy electricity generator to power the pump reduces the emissions of carbon dioxide produced. For these reasons there is considerable scope for the use of heat pumps and they can make a significant contribution to heat generation without impacting on the landscape, particularly in an integrated renewable energy system.

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