BRECON BEACONS NATIONAL PARK

LOW HEAD HYDRO ELECTRICITY IN THE BRECON BEACONS

OVERVIEW

This information sheet is for individuals who are considering the installation of small scale low head hydro electricity generators on their property. The NPA acknowledge the significant environmental benefits of energy efficiency and renewable energy and believe that their potential is vast and under utilised. We recommend that energy efficiency improvements should always be considered before fitting renewable energy.

HOW DO THEY WORK?

Micro hydro, or small-scale hydro, is one of the most environmentally benign energy conversion options available, because unlike large-scale hydro power, it does not attempt to interfere significantly with river flows.

Hydro power works by using falling water to drive a turbine, which generates electricity. The amount of energy produced by a hydro power scheme depends on how far the water is falling (called head) and the flow rate.

Low-head sites are generally considered to be where the head is less than 3 metres.

Hydropower is a well-proven technology, relying on a non-polluting, renewable and indigenous resource, which can integrate easily with irrigation and water supply projects.

Above: A potential low head site, where existing structures could be utilised.

Below: Utilising an Old Mill

WHERE SHOULD IT BE SITED?

Environmental criteria are very important in deciding whether a site is suitable for hydro power. The following permissions are usually needed to run a hydro power project:

- Planning permission from the local authority
- A water abstraction license from the Environment Agency
- A "Works in Rivers" consent

One way to identify sites for small hydro power projects is to look for old water mill sites (or place names including the word "mill"). Usually the highest cost in Hydro power development is the building work needed to house the turbine appropriately and redirect water from the river through the turbine, old mill sites may have some of the building work in place already.

Although it is possible to use existing waterwheels to generate electricity it can be expensive and inefficient due to gearing required to get from the low revolutions per minute (rpm) of the waterwheel to the much higher rpm required by the electricity generator.

The environmental impacts associated with construction and possible alterations to the river environment should be minimal for a micro hydro power project if the scheme is well designed. Nevertheless, sites should still be chosen carefully.

COST AND MAINTENANCE

The initial capital cost of a scheme is quite high (normally in the region of £3000-£5000 per kW capacity for the smaller systems). However once the plant is in place it should generate free electricity (apart from maintenance costs) for decades. Only the turbine itself would need to be replaced, every 15-50 years. In general, higher output hydro sites tend to have a lower cost per kW capacity.

Grants

A number of grants are available for low head hydro systems. Please contact the NPA for current information.

Which installer do I Choose:

The NPA has a list of certified local installers on their website. Alternatively please contact the NPA on the number below for further information.

For further information please contact:

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