

Small hydroelectric power – Betchworth Estate, Surrey

Existing or Proposed Project:	EXISTING – commissioned August 2004
Location:	River Mole, Betchworth Estate, Betchworth, Surrey RH3 4AE
Owner / Developer:	Betchworth Estate Hydro Limited/Lord Hamilton of Dalzell
Description:	Two 27.5kW _e low-head hydro turbines



Background:

Betchworth House lies in attached parkland near Dorking in Surrey. On the River Mole which flows through the park there is a late 18th century weir, which in 1999 the estate owner determined to restore.

Spencer Latham/Babtie Jacobs were contracted to undertake the feasibility study and ongoing consultation. It turned out that there is good enough 'head' (roughly the height from the incoming water surface to that of the exiting water) available and flow for a sufficient proportion of the year, this being helped by run-off into the river from the impermeable surfaces of large urban and airport sites upstream.

After much communication with the Environment Agency it was decided to offset the costs of the required fish impact mitigation measures through exploiting the river's hydroelectric potential at the weir. Prolonged discussions ensued with the relevant government agencies, until three years after the original proposal when the project was finally granted permission.

Technology / Scope of Project:

The weir was fitted with two identical hydro turbines by NHT Engineering Ltd, giving a total capacity of 55 kilowatts. Such small hydropower technologies usually allow part of the river to pass through the submerged turbine at speed due to the drop in height at the weir (?? metres at Betchworth), guiding the water optimally onto the internal rotor blades that are fixed to an electrical generator.

The power thereby generated is fed into the regional electricity network; some of this covers the estate's own power demand, but about 90% is surplus and the purchasing electricity company provides revenue according to this net amount supplied.

First estimates of annual income have been put at £18,000. Due to legislative and technical requirements and delays, the entire project's consultancy fees were around £150,000 before work even started, although this includes the weir restoration and therefore would not be a typical figure for a pure hydropower project.

Importance to the South East:

A 2004 TV Energy report for the Environment Agency (see www.tvenergy.org) has estimated there could be almost 500 sites in the South East with a theoretical potential (i.e. at least 1.5 metre head) for power generation, with a possible combined power output of up to 35 megawatts on the River Thames alone. It is believed that old mills represent the best sites for immediate development, while weirs such as at the Betchworth Estate hold the biggest opportunities medium to long term.

The low-head hydro resource in the region is under-exploited for various reasons, particularly due to the additional costs of precautionary solutions to environmental issues. However, it is also potentially due to the high initial capital outlay necessary (this already applies to the initial feasibility study), combined with a general lack of awareness amongst weir and mill owners of the technology and its financial benefits.

It is very important for regionally pioneering schemes to be present, with enthusiastic proprietors who have the vision, access to good advice, and sufficient funds to help overcome unexpected barriers; these qualities are exemplified in the Betchworth turbines. Such projects can get publicised via regional information sources, demonstrate the technology and stimulate interest from fellow site owners.

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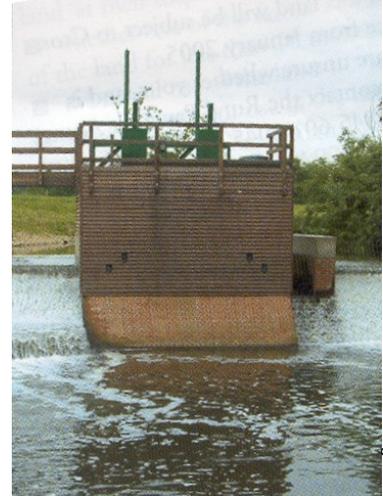


Photo: CLA South East magazine