



# Sowton Mill

## Dunsford, Devon

### SMALL-SCALE HYDRO POWER



Sowton Mill.

### Introduction

Sowton Mill is an historic mill on the River Teign. The mill stopped operating as a corn mill many years ago, but retained the leat and tailrace which used to carry the water to and from a water wheel. In the early 1980's the owner decided to build a micro hydropower system to generate enough electricity for the three nearby dwellings and sell the surplus to the national grid.

### How it works

The water is diverted away from the natural river course by a weir about 500 metres upstream. The leat carries the water from the weir to the turbine inlet screen (just beyond the bridge in the picture). The screen filters out debris that would otherwise cause damage to the turbine, and prevents the ingress of fish. From the screen a 1 metre diameter concrete pipe takes the water into the purpose built turbine house. This is about the size of a small garage and is screened by plants in a corner of the garden. Water passes through the turbine (shown overleaf) and down into the original mill tailrace from where it returns to the river. A controller monitors the water level and regulates the turbine power output so that minimum water levels are maintained. In the event of a power cut the turbine disconnects, and reconnects automatically when grid power is restored.

## Quote from owner

“Cast out any idea of capital repayment within five years. Micro hydropower is initially capital intensive and it might take up to ten years to recoup the costs. But, once it is paid for, running costs are very small and you get a steady income for your life, and your children’s lives.”

## Maintenance

The owner is very happy with the system. It has been running now for 16 years with hardly any problems, just an occasional bearing to replace or branch to remove which has floated down the leat.

Picture of Turbine.



## Technical Details

**Turbine type:** Ossberger crossflow, rated flow rate 850 litres/second.

**Speed increaser:** Flat belt and pulley system.

**Generator type:** Three-phase asynchronous, exited by the grid.

**Site hydraulic head:** 4 metres.

**Maximum power output:** 28kW.

**Annual energy capture:** 132,000kWh.

## General Cost Profile

The cost of a small scale hydropower development will be very site specific and will depend on factors such as the hydraulic head, amount of civil works required, ease of grid connection etc.

However, as a general guide the installed cost of a small scale hydropower development will be between £1,000 - £3,000 per installed kW.

### For example:

A 10kW site may cost between £10,000 and £30,000 to install. The annual electricity generated would be of the order of 50,000kWh.

At a sale price of 6p/kWh this would equate to an income of about £3,000 per year, with a small maintenance budget for periodic part replacement.

