

## Introduction |

While the principle of hydro power is easy to grasp, putting it into practice in a modern context is more difficult. The strength of this case study is that the local authority took a direct approach to utilising the county's water power resource by identifying a group of people with potential to use and benefit from hydro power - mill owners. The authority then enabled the group to take forward their own project.

## Local Authority role |

South Somerset District Council, in partnership with twelve local mill owners led a project that has stimulated new micro hydro power installations at seven sites to date with a further five expected. The district council was able to secure feasibility and implementation funding through the Energy Saving Trusts Innovation Programme. This funding would not have been available to the mill owners without a local authority partner. The first stage was to undertake a feasibility study to investigate the potential of utilising hydro-electric power on a small scale at old mill sites now used as dwellings

**Photo 1:**  
Gants Mill, one of the sites  
participating in the  
Wessex Hydro project.



## Context, including funding and resource |

### **The overall objectives are to:**

- increase the amount of electricity generated from renewable sources within the districts of South Somerset, North Dorset and Mendip;
- raise the profile of renewables and foster a greater understanding and awareness of the need for and the opportunities to pursue renewables;
- reduce mill owner/occupiers' dependence on electricity generated from the burning of fossil fuels;
- investigate the energy efficiency measures that can be undertaken at each mill site;
- meet South Somerset District Council's corporate objective of increasing electricity generation from renewable sources to at least five per cent of electricity consumed.

## Process/partners |

Twelve Somerset mill sites whose owners wanted to develop hydro-electric power were identified. These mill owners agreed to make a financial contribution towards the feasibility studies which was matched by the council. Feasibility studies were followed by detailed system design and costing, negotiation of abstraction licences and eventually, installation of new turbines and generators. Hydrogeneration Ltd have acted as consultants, negotiating with the Environment Agency to achieve the necessary licenses.

The South Somerset Mills Group has established its own way of working, meeting every six weeks, and has successfully raised grants from the Energy Saving Trust and an electricity supply company to enable them to install turbines at seven of the sites. Installations at the remaining sites are expected to be completed by the end of 2007.

## Carbon savings |

The 12 plants are expected to give a total of 155 kW of installed capacity and to produce over 600MWh of electricity per year. Savings of carbon dioxide are estimated to be 300 tonnes per year.

## Associated costs and savings |

With grant funding, it has been possible to achieve a return on the mill owner's investment of less than eight years. Crossflow turbines have been chosen for most of the sites. At one site, a low cost Vietnamese fixed flow propeller turbine has been used, at another the mill the owner has designed and built his own 10 kW double regulated Kaplan turbine and cleared the silt from 200m of clogged, brick lined, underground leat by hand.



**Photo 2:**

Modern hydro power equipment can be integrated into the existing Mill infrastructure

	Site 1	2	3	4	5	6	7
<b>Turbine type</b>	Vietnamese propeller	Valley H crossflow	Ossberger crossflow	plastic francis + Armfield	Valley H crossflow	Valley H crossflow	Double reg kaplan
<b>Design output kW</b>	2	3.7	3.7	1.6 + ?	8.2	12	10
<b>Mean flow</b>	0.443	?	0.23	2.77	0.15	0.43	1.21
<b>Q40 cumecs</b>	0.34	0.15	0.17	2.17	0.11	0.32	0.98
<b>Rated design flow</b>	0.15	?	0.18	0.6	0.11	0.495	0.98
<b>Gross Head</b>	2.4	4.5	3	3	6.13	4.9	2.24
<b>Permissions and advertising</b>	648.75	320	324	353	642.9	1756	570
<b>Detailed design and costing</b>	1941	1750	2726	by owner	2000	1124	1014
<b>Civils - materials and hired labour</b>	200	2856	2634	3742	2125.05	391	2490
<b>Intake screen</b>	2000	545	550	296	750	NA	371
<b>turbine house</b>	NA	NA	712	NA	6300	115	NA
<b>Turbine</b>	2406	6750	15672	2,000	7370	10354	3026
<b>Penstock</b>	400	1238	2333	500	1425	2254	NA
<b>Generator</b>	500	500	500	500	500	617	146
<b>Grid connection and control box</b>	2600	2764	2625	5500	3400	5538	2905
<b>Additional electrics</b>	450	685	150	600	800	3678	300
<b>Other materials for installation</b>	NA	980	5256	NA	NA	NA	NA
<b>Hired labour for installation</b>	4800	4881	6525	2250	Inc above	Inc above	19256
<b>Totals</b>	<b>15,945</b>	<b>23,269</b>	<b>40,007</b>	<b>15,741</b>	<b>41,387</b>	<b>25,827</b>	<b>30,078</b>

**Table 1:**

Development costs for first seven mill sites in South Somerset

## Project/spin-offs |

It has encouraged similar groups to form in the south west and around the UK using the same model of a mill owner group/civil society partnership, including:

**Mendip, West Dorset, Wiltshire, Dartmoor, Exmoor, Kent and South London and Herefordshire.**

## Change to working patterns/partnerships |

The lead organisation was **South Somerset District Council (SSDC)**.

Other organisations involved are:

**Mendip District Council** - provided officer support and part funding;

**North Dorset District Council** - provided officer support and part funding;

**Renewable Heat and Power Limited** - consultants for assessments of sites.

An offshoot consultancy has since been formed called Hydrogeneration Ltd;

**Wessex Water Power Group** - a consortium of local mill owners;

**The Environment Agency** - provide statutory permissions for hydro projects.

## Contact, sources of advice |

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