

Archimedes solves a modern problem

Goring and Streatley Parish Councils turned to Archimedes when their plan to turn the flow of the river Thames into hydro-electric power proved too expensive and too cumbersome to achieve by more mundane means.



If you stand on the bank of the river Thames at Goring and look at the water flowing past you are likely to think "That's a lot of water!" And then you might start wondering what the volume of the flow could possibly be and whether or not it could be transformed into useable energy.

When the Goring Parish Council (GPC) looked into the prospect of transforming the energy of the Thames into useable power it was pleasantly surprised, an average of five million tonnes of water flows through the Goring Gap every day, much more after heavy rains. Surely, the Council conjectured, that's got to be enough to do something with?

So back in 2005 the GPC decided to investigate the feasibility of extracting hydro-electricity from the river. The idea took hold and the Council part-funded a feasibility study with South Oxfordshire District Council. They researched specialist consultants, obtained three quotes and commissioned one of them to do the groundwork. At the same time the GPC added hydro-power to its Parish Plan – an important requirement when seeking funding. The consultancy reported in 2006 stating that it was possible to obtain 170kW (about enough to keep 170 homes supplied with power) from no fewer than 15 turbines at six locations on the weir.

In 2006 the fledgling Goring and Streatley Sustainability Group (GSSG) developed a constitution and appointed a chairman, a secretary and a treasurer, and opened a bank account all of which proved essential when the Group started applying for grants. Independently, Streatley had included hydro-power into its Village Statement in the same year. Fortunately for everyone's morale, no member of the Group knew of the proposed scheme at Romney near Windsor to supply the Queen in her castle; a long-running endeavour that took 12 years to obtain all permissions and is only now on the verge of ordering turbines.

The Feasibility Study gave everyone hope but more detailed information was needed. The scale of the engineering works required to install 15 turbines was such that an alternative solution had to be found. Their search took them back about 2,050 years to the invention of the Archimedes screw, a solution suggested by the Environment Agency (EA). The Agency recommended the installation of fish-and-eel-friendly Archimedes spirals, so the switch was made to this ancient-and-modern technology.

The UK's leading expert, Dave Mann of Mannpower, produced an outline design study which indicated that 246kW of electrical power could be produced from three 3.5m diameter reverse Archimedes spirals in one location. Added benefits of the scheme include zero pollution, reduction of more than 500 tonnes of CO₂ a year and an expected lifetime of three generations.

To fund this study GSSG has successfully applied for grants from Chilterns Sustainable Development Fund (SDF), North Wessex Downs SDF, Streatley PC and SODC. This phase was completed in March 2008. The quest for cash continues. The process is now part way through the Environment Survey – for which they had to obtain further funds – with the EA funding the baseline flood risk analysis.

More grants are needed to complete these so that the necessary permissions and licences can be obtained from the EA to allow installation of the spirals. To finance the actual construction, local communities have been sounded out regarding a local share issue and the response has been encouraging, but significant funds from the EU will also be needed to make it all happen. John Howell and James Elles Euro MP have already visited Goring Gap to see for themselves what is entailed in this ambitious development. They are both very supportive and have offered invaluable advice on where to find EU funding.

It's a long road the GPC still has to travel and much of it is strewn with fund raising to pay for the various studies and analyses. It will be a great educational destination that will increase tourism by about nine other communities in a similar situation to Goring already, so Archimedes may soon become a familiar name to school children that live close to UK's major rivers.

GENEROUS CONTRIBUTIONS

This project would not have made any progress without the generous contributions from the following organisations: North Wessex Downs AONB SDF, Chilterns AONB SDF, GSSG voluntary fund raising activities, Streatley Parish Council, South Oxon District Council, Goring Parish Council, Goring Amenity Association.

FURTHER INFORMATION
For up-to-date details on the scheme, see www.gssg.org.uk

Top left: The weirs at Goring and Streatley, 2008. **Top right:** Weir with three 3.5m Archimedes spirals. **Above:** The Archimedes spiral is the preferred technology. It allows fish and eels to pass through without harm, is low maintenance, relatively easy to install, visually entrancing and audibly relaxing.

