Of all the renewables technologies, Euan McConnell Ltd seeks to offer products and services related to the micro hydro industry as we believe that Hydro offers the most useful and reliable energy. If there is one thing that we are blessed with in the UK it is rainfall! The UK micro (<50kW) hydro and pico (<5kW) hydro markets are largely undeveloped. We feel that with the introduction of the Feed In Tariff and an increased public awareness of reliance on fossil fuels and its effects that there will be an increase in the demand for micro and pico scale hydro.

We are members of the REAL assurance scheme www.realassurance.org.uk and have joined the MCS transitional scheme for micro (<50Kw) hydro installers.

We seek to complete project life cycle services from site survey through design, planning, environmental assessments, manufacture, installation, commisioning warranty and maintenance. We offer products and services related to the smaller end of the market. Typicall y old mill owners, farmers and landowners who have a watercourse running through their property.
We offer a cost effective and personal service for each of our customers.

WHY HYDRO?

While solar panels struggle to payback their high cost per kW and wind turbines lie stationary during our now more frequent long cold spells of still air a professionally designed and installed hydro system can offer consistent and reliable power for a larger percentage of the year. Hydro electric production is not confined to daylight hours or windy days.
While there is a variation in water flow in any watercourse, the water taken from that watercourse needn't vary in amount and therefore water flow is much more consistent than daylight hours or wind.
As hydro can work 24 hours a day, 7 days a week the total energy produced per annum for a rated capacity exceeds that of other forms of renewable energy.
For instance a 6kW hydro system, properly designed and installed, can be expected to generate 6 (rated capacity) x 24 (hours per day) x 7 (days per week) x 52 (weeks per year) = 52,416kWh per annum.
Of course some down time should be allowed for drought and maintenance but to compare, a good 6kW wind turbine on an exceptionally windy site (8 metres per second annual average windspeed) can only be expected to generate at most 30,000kWh.

The downside of Hydro is that not everybody has a river or stream running through their property. Those that do may have a site that isn't suitable as the costs for installing a system are prohibitive.

IS MY HYDRO SITE VIABLE?

To establish whether a site is viable or not depends on a number of factors. The main factors to consider are the flow and head of water. A simple calculation determines the amount of energy available. Hydro energy is stored as gravitational potential energy. The gravitational potential energy of a watercourse is equal to its flowrate in litres per second multiplied by the head in metres.

It is important to remember that flow in a watercourse varies throughout the year so it can be misleading to take only one measurement of flow at a set point in time. Ideally flow should be measured and recorded at regular intervals over the course of a year to allow creation of a flow duration curve.

Physical measurement of the flow can be expensive and or time consuming so we recommend that a customer thinking of installing hydro employs the service of a hydrologist to establish the flow duration curve for a given site. Typically a flow duration curve would be used to size the turbine for the site. In some cases, for very small streams hydrologists reports are not available or can be inaccurate due to for instance, local drainage or blockage of drainage. In these cases there really is no substitute for measuring the flow.

Of couse once the water potential energy has been established, not all of this available energy can be converted to electrical energy as there will inevitably be inefficiences and loss in whatever system is installed. There are generator losses, gearbox losses, invertor losses, heat losses and noise. As a rule of thumb these losses can conservatively be equated to 50% of the total energy available.

So if you had a watercourse with 10m head and 15 litres per second flow the total energy available would be 10 x 15 x 9.81(gravitational constant) = 1471.5W. However the likely electrical output would be around half that at 735W. This may not sound like much but running continously for a year it could produce enough electricity to match the usage of a small household. When grid connected (not always viable) FITs could be claimed on this electric production regardless if it is consumed or not so not only would your electric be for free, a small income would be possible as well.

The viability of such a system would depend on the costs. Some of the costs such as Environment Agency or SEPA abstraction fees, Planning Fees and Grid connection fees remain the same up until a threshold so it is therefore understandable that larger systems are more cost effective as the fixed costs represent a smaller percentage of the total costs and of course the returns are higher. Larger companies see the threshold for viability at anywhere above 30kW. We intend to keep our overheads low so that we can continue to offer cost effective systems at the smaller end of the micro hydro scale.

WHAT WE OFFER

As professional engineers with practical hands on experience we seek to offer complete project life cycle service to support the design, planning, installation, commisioning and periodic maintenance of our products detailed below. We can employ the services of other professionals to assist when required. If you want to know more, please contact us.