Micro Hydro Systems - Initial Viability Study

Installing a solar PV system is easy, just plug it in and it does the rest.
Designing and installing a hydro system is a bit more complex and initially requires a lot of data to decide if the site is going to be viable both from an economic and environmental perspective.
Many people who come to us start by asking “How much water do I need?”.
Hydro design always starts with “How much water have you got?”, and how much height is there between the point where you will take it out of the water course and the point where you will return it. This data together with the distance between the two points enables us to calculate what might be possible.

Very few water courses have the same amount of water in them all year round. Many might be full in Winter but are almost dry in Summer.
Environmental restrictions may specify that a certain volume cannot be removed from the water course and must be allowed to flow down the depleted reach (the distance between abstraction and return) to protect the existing habitat.

When all this is known the turbine and its pipes and screens can be designed specifically for that location.

If you have a possible site then we can start with a free “desk top” Initial Viability Study which uses both the data you supply plus the various software and mapping systems we have to come up with a response which might be somewhere between “definitely interesting, or no chance”
This will enable you to decide if you wish to proceed further or drop the idea without spending any more time or money.

Please complete the following questionnaire as fully as possible to enable us to make a “desktop” evaluation of the potential for generating electricity at your chosen location.

Basic Data

Your Name	
Your Address Post Code	
Tel No. Mobile No.	
Email Address	
Hydro Site Address (If different from above)	

Basic Site Description

How would you describe the watercourse (please ✓ the best description)	Mountain / hill stream with steep gradient Stream or small river through fields with little gradient Man made ditch or open culvert Underground pipe or culvert Water Mill leat Other:-
What is the source of your watercourse (please ✓ the best description)	A catchment area higher up Overflow from a lake or reservoir Road or other surface drainage Other:-
Are there any fish species or other aquatic life in the water course (please ✓ as required)	Yes (please describe) No Don't know

Specific Site Data

Grid reference for the intended abstraction point (see note 1)	
Grid reference for the intended turbine location (see note 1)	
Head (vertical distance) between the abstraction point and the turbine location (see note 2)	Metres
Penstock length (see note 3)	Metres
Typical average monthly flow rates over 12 months (see note 4) Measured in litres per second. Or:-	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Not Yet Recorded ✓
Is the bed of the watercourse predominately	Rock Loose stone Silt Mud Other:-
Is the installation intended to be:-	Off grid On Grid
If the system is on grid, how will you use the generated electricity	In your house or other building.

Please ✓ as appropriate	No on site consumption, all generation will be exported.
If you have an existing off grid installation, please briefly describe it.	
What is the distance from the turbine location to the place where the system will be connected to either an on or off grid connection:-	Metres
Can you provide some images of the proposed site (It is usually easiest to email these to us.)	Please include the proposed abstraction and return sites together with several images of the terrain between.

Notes

1. The grid reference for the abstraction and return points can be provided either as a 10 digit National Grid Reference comprising 2 letters and 10 numbers, or as Latitude and Longitude. You can use the web site www.gridreferencefinder.com . Enter the nearest post code to bring up the satellite image and then zoom in if required. Right click on the point and a flag will appear. At the bottom of the page you will see both the grid reference and Lat Long displayed against the flag number.
Alternatively you can use Google Earth to display the area. When you "hover" your mouse point over the satellite map you will see the Lat Long and altitude displayed at the bottom of the page.

2. The most accurate way to measure the head is with a staff and level. For the Initial Viability Study it is generally sufficient to use the altitude data available from Google Earth. Alternatively you can estimate it using the contour lines on a 1:25k Ordinance Survey map.

3. The pipe length between the abstraction and return points can be calculated using the ruler / path tool in Google Earth or with a scale rule on an ordinance survey map. However, the measured distance is the true horizontal distance so will need to be adjusted to the slope distance using the height and a bit of trig. If you have lost your trig tables then go to www.cleavebooks.co.uk/scol/calrtri.htm where you enter 2 sides of a right angled triangle to calculate the length of the hypotenuse.

4. Measuring the average monthly flow over 12 months to generate an annual flow duration graph is usually the biggest challenge. On larger systems we can use a software package called LowFlows to provide a reasonably accurate 12 month forecast. However, on small systems this software may possibly be quite inaccurate so actual physical measurements to back up the computer predictions is always recommended. Deciding how to take the measurements is the first step and the various possibilities using a bucket, tennis ball and stop watch or a V notched weir are described in one of our info sheets.

If you need any help with the questionnaire just drop us an email or call and we will do our best to assist. When you have as much information as possible either fill in the questionnaire on line or email it to us at enquiries@westflight.co.uk or send it by post to Westflight Ltd, Tai Gwynion, Clatter, Caersws, Powys, SY17 5NR and we will get back to you within 14 days.