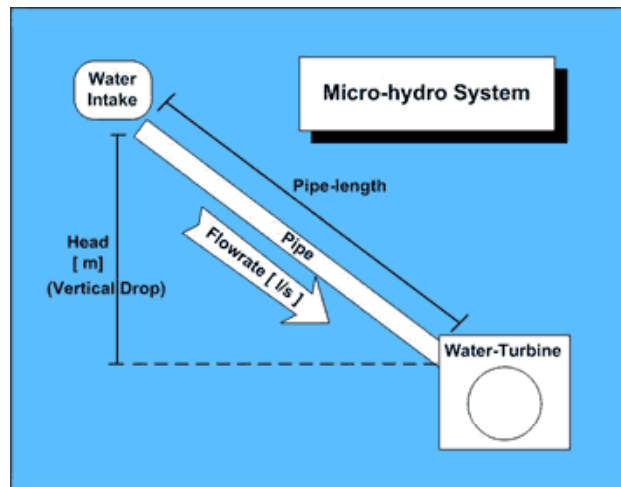


EcoInnovation Water turbines –Site assessment

EcoInnovation will assess your site and advise all the equipment that you require and cost so that you can decide if a renewable energy micro-hydro system is right for you.

Micro-hydro is usually the most cost effective means of generating renewable energy. Recent changes to the Resource Management act require councils to take into account the benefits of renewable energy and encourage it. A small hydro system can generate all the power that a domestic house needs from as little as \$5000. Typically this is more often around the \$10,000-\$12,000 mark. How much you generate will depend upon the available head and flow of your river.

If your river has less than 2m of fall over 100m of distance it will not in most cases be economic to pursue micro hydro, as the alternatives of solar PV and wind may be more cost effective.



You will need to measure the following data:

Vertical drop in meters (referred to as head or fall)

- Altimeter - obtain an altimeter accurate to 3m, good for measuring falls greater than 20m.
- Building level – measure the fall of the river as you progress along its length. Good for lower falls and very accurate.
- Pipe - lay a length of 20mm plastic pipe in the riverbed, fix a pressure gauge to the end and measure the pressure of the water to fill the line (100 KPa is 10m of fall), measure the static pressure. Make sure you clear the line of all air first. This is a very accurate method and easy to do.

Pipe length

You are trying to identify a section of your river/stream that falls quickly over the shortest possible distance. There may be several places that are suitable on your river. You also want the turbine to be as near to your house as possible to save on cabling costs. Measure the pipe length using a 30m tape, be accurate, as this information will be required to buy the pipe and it's important to get it right. EcoInnovation will advise the pipe size required, normally 50mm or larger.

Water Flow

At flows below 20 L/s you need to accurately measure it. If you have a 10 liter paint pail and the river can fill it in 1 second you have 10 L/s. Try and find a place in the stream where it

drops quickly over a rock, place your bucket below and measure the time to fill it. Use the largest possible bucket you can find as the longer it takes to fill the more accurate your reading will be. For flows greater than 20 L/s try to estimate your flow using a 20-liter bucket in the river and measure at various places across the river. It will not be accurate but at higher flows it is not important unless you want to install a turbine on heads less than 3m.

Cable distance

Measure the cable distance accurately with a 30m tape. The shorter you can keep the cable distance the better, distances up to 250m are OK but beyond this it is better to use our high voltage unit and transformer pack to save on cabling costs, distances can then be up to several thousand meters.

Preferred voltage of battery system

EcoInnovation prefer new clients to use 48-volt systems. This ensures cable/regulator and inverter costs are lower and that the system efficiency is higher. For smaller systems and those wishing to purchase cheaper square wave inverters then 12 and 24 volt systems might be appropriate. EcoInnovation can advise your options.

Existing equipment

If you have any existing equipment then tell us as this might have a bearing on our recommendations:

- Batteries size, type and voltage
- Regulator make and model
- Generator make and output power
- Charger make and power rating
- PV Panels, total output power
- Wind turbine, make and size
- Hydro any existing equipment

Site Sketch

A pencil site sketch of your site might help us to see an economic micro-hydro solution.

	Site One	Site two
Vertical drop (m)		
Pipe length (m)		
Water Flow (L/s)		
Cable distance (m)		
Preferred voltage (Vdc)		
Existing equipment <ul style="list-style-type: none"> • Batteries size, type and voltage • Regulator make and model • Generator makes and output power • Charger make and power rating • PV Panels, total output power • Wind turbine, make and size • Hydro any existing equipment 		