



# Low Carbon Technology Guide

## *Hydropower*

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# 1. What is it?

Hydropower systems (also referred to as hydroelectric systems) are a type of renewable energy technology that uses the flow of water to generate electricity, which you can use to power your home. The water in rivers and streams always flows downhill due to gravity. This flow of water pushes the blades of the turbine, forcing them to rotate. The rotation of the blades turns a shaft connected to a generator, which converts rotation into electricity. Hydropower systems can generate renewable electricity at all times, provided there is enough water in the stream or river for the system to operate. This makes them a good option for properties that are not connected to the electricity grid but have access to a suitable water source (see 'water source requirements' below for more on this).

# 2. What should be considered before installation?

## 2.1 WATER SOURCE REQUIREMENTS

Hydropower systems are very site-specific, and most homes will not have access to a water source suitable for installation. To be suitable for electricity generation, a water source must have the right combination of flow rate (how many litres of water flow past a point every second) and head (difference in height between two closely located points in the source). A qualified installer is able to assess whether your site is suitable for a hydropower system.

## 2.2 ENVIRONMENTAL LICENSE AND PLANNING PERMISSION

All hydropower systems require an environmental license and planning permission to be installed. A qualified installer should be able to advise you on how to obtain them.

## 2.3 MAXIMISING THE BENEFITS OF HYDROPOWER SYSTEMS

A hydropower system might generate more electricity than is needed for your appliances and lighting, so you could consider installing battery storage to store excess power for when you need it most. Another often cheaper alternative to battery storage would be to install a 'diverter switch' that would use any excess electricity generated to power the immersion heater in your hot water cylinder (assuming you have one installed), which would preheat water for you to use later. Finally, if your house is connected to the electrical grid and has a smart meters, you can potentially export surplus electricity to the grid and get paid for it by applying for a Smart Export Guarantee (SEG) tariff.

## 2.4 COMMUNITY ENERGY PROJECT

If you have a suitable water source and there are other properties nearby, you could consider installing a hydropower system as a community energy project rather than as a system to supply just one home. Doing so would allow you to share the installation costs with other households, which can also benefit from the renewable electricity generated by the system.

### 3. How much does it cost?

Because hydropower system installation is very site-specific, prices vary significantly and would depend on the size and type of the system and how much work is required to install it. According to the Centre for Alternative Technology, the basic equipment for a 1kW off-grid battery charging system might cost £5,000 to £6,000 in addition to installation costs. It is generally recommended to get quotes from at least three installers to get a good idea of how much the system would cost you.

### 4. What is the maintenance like?

Most hydropower systems can last for 40-50 years and longer if properly maintained and usually have low running and maintenance costs.

### 5. How can I get it?

Hydropower systems require technical knowledge to be installed properly and should only be carried out by a qualified installer. You can find an installer in your area using the following link: [The Renewable Energy Hub UK](#).

Most reputable installer companies are members of the British Hydropower Association, the main trade body for the hydroelectric industry in the UK. You can check if your chosen installer is a member of this association by following this link: [British Hydropower Association](#).

## 6. What funding help is available?

### 6.1 HOME ENERGY SCOTLAND LOAN

If you live in Scotland and are considering a hydropower system for your property, you could be eligible for an interest-free [Home Energy Scotland](#) loan of up to £2,500.

### 6.2 SMART EXPORT GUARANTEE (SEG)

If you live in England, Scotland or Wales, you can potentially sell excess electricity generated by a hydropower system to the grid through [Smart Export Guarantee](#) (SEG).

### 6.3 ADDITIONAL FUNDING INFORMATION

Depending on where you live, below are some organisations that can advise you on the funding options that could be available to you.

England and Wales: [UK Government](#)

Scotland: [Home Energy Scotland](#)

## 7. Useful websites

For more information on the hydropower systems, please visit the following websites:

[Energy Saving Trust](#)

[TheGreenAge](#)

[Centre for Alternative Technology](#)

Please note that the information provided in this guide is subject to frequent changes. Readers are strongly advised to verify the information through the links provided above or consult other reliable sources before making any decisions.