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Welsh Government

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# GENERATING YOUR OWN ENERGY HYDROPOWER



2D



Helpu Cymru i leihau  
ei Hôl Troed Carbon  
Help Wales reduce  
its Carbon Footprint

A planning guide for  
householders, communities  
and businesses

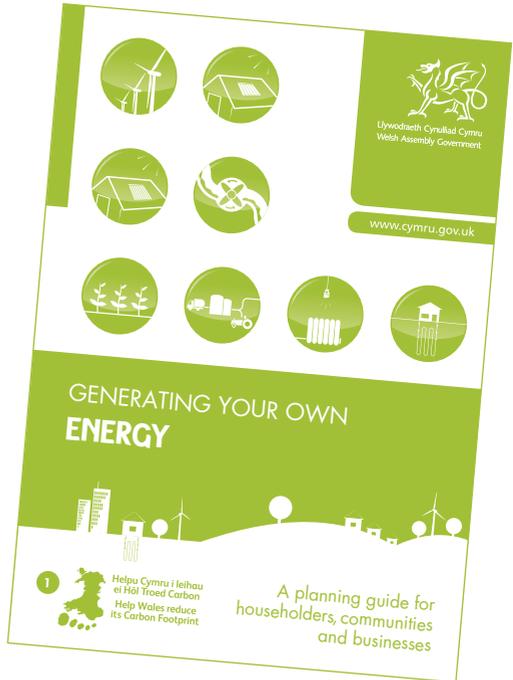
# Introduction

This leaflet is part of an information pack for householders, communities and businesses who want to generate their own energy through small or community scale renewable energy technologies. This may be to benefit from the Clean Energy Cashback Scheme (also known as the Feed-in Tariff) and to help tackle climate change.

The pack is intended to give you some useful information on what issues you should be considering when installing a renewable energy technology, including the current planning regulations and ways in which you can install the technology to reduce any impact on you, your neighbours and the local built and natural environment.

Please read Leaflet **1**  
**Generating Your Own Energy**  
– **A Planning Guide for**  
**Householders, Communities**  
**and Businesses.**

This can be found at  
[www.wales.gov.uk/planning](http://www.wales.gov.uk/planning)



# What is hydropower?

Hydropower is the use of water flowing from a higher to a lower level to drive a turbine connected to an electrical generator, with the energy generated proportional to the volume of water and vertical drop or head.

## What is a hydropower plant?

- Small/community scale hydropower schemes can comprise of the following components:
  - Hydroelectric generators – placed in the watercourse
  - Structures – to house the hydro-turbine
  - Electricity transmission equipment
  - Pipework – to direct the water
- **Size** - Schemes at the smaller end of this scale (typically below 100kW) are often referred to as micro hydro. The likely range is from a few hundred watts (possibly for use with batteries) for domestic schemes, to a minimum 25kW for commercial schemes.
- A hydropower scheme requires a water source with sufficient flow and head (the height the water drops).
- **Licences** - As water is taken from a stream for hydro purposes an abstraction licence would be needed from the Environment Agency see [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)





Padarn Hydro Scheme, Llanberis, Snowdonia (Credit: Dulas Ltd)

## Do I need planning permission for a hydropower system?

Details of the current planning regulations for hydropower systems (including the structures to house turbines) can be found in Leaflet **3** **Generating Your Own Energy - The Current Planning Regulations** that accompanies this pack.

# What planning issues should I be aware of when considering installing hydropower?

- There are economic, social and environmental impacts that should be considered when installing hydropower. Some of these impacts arise during the installation and construction phases, and there are a number of ways in which the design, location and installation of hydropower can minimise these impacts.
- The checklist below provides some of these impacts and ways in which you can minimise them.

Hydropower checklist		
Issue	Impact	Ways to minimise the impact
Landscape and visual	The impact on the character of the landscape and changes in the visual appearance of waterfalls.	<ul style="list-style-type: none"><li>• Incorporate screen planting and design built elements to be as small as possible and in keeping with local landscape features.</li><li>• Bury pipeline and restore pipeline route after construction.</li><li>• Ensure colour and materials of built elements are in keeping with local landscape features.</li></ul>



## Hydropower checklist (cont.)

Issue	Impact	Ways to minimise the impact
Ecology	Disturbance of habitats/species from impact of altered hydrological regime and disturbance to migratory patterns and death/injury of fish.	<ul style="list-style-type: none"><li>• Avoid construction during seasonal fish migration.</li><li>• Install turbines that can oxygenate river water to benefit fish population.</li><li>• Incorporate fish passes and screens into weir.</li><li>• Protect water quality, restore habitat edges adjacent to water course and contain works to minimise disturbance footprint.</li></ul>
Hydrology	Increase in noise levels at nearby residences during operation.	<ul style="list-style-type: none"><li>• Implement good pollution prevention practices based on Environment Agency Wales guidelines.</li><li>• Minimise area of impermeable surface, reinstate vegetation where possible and use appropriate culverts and drains to match existing hydrological regimes.</li></ul>

## Hydropower checklist (cont.)

Issue	Impact	Ways to minimise the impact
Noise	Increase in noise levels at nearby residences during operation.	<ul style="list-style-type: none"><li>• Design of turbine house to incorporate acoustic insulation materials.</li></ul>
Historic Environment	Visual impacts on the setting of heritage features.	<ul style="list-style-type: none"><li>• Siting of turbine houses where they will be least obtrusive and where they will be hidden by the contours of the land or blend into natural and existing man made features.</li><li>• Design turbine housing with local building materials, and incorporate appropriate screen planting.</li><li>• Bring existing disused buildings back into use.</li><li>• Bury pipeline, or use black coloured piping, and restore pipeline route after construction.</li></ul>



## Explanation of terms

Landscape	Landscape includes the statutory landscape designations which are National Parks and Areas of Outstanding Natural Beauty.
Ecology	Ecology includes the statutory nature conservation designations such as of Sites of Special Scientific Interest (SSSIs), sites designated under the Ramsar Convention, Special Protection Areas (SPAs) or Special Areas of Conservation (SACs). It also includes those species protected by law.
Historic Environment	Historic environment includes archaeology and ancient monuments, listed buildings, conservation areas and historic parks, gardens and landscapes.

## Other approvals

There may be other kinds of approval that you may need such as:

- Listed Building consent if a building is listed.
- Conservation area consent if the development is in a conservation area.
- Trees – Many trees are protected by tree preservation orders which mean you need the council's consent to prune or fell them.
- Building Regulations – New building work will often need to comply with Building Regulations.
- Wildlife – Some buildings may hold roosts of bats or provide a refuge for other protected species – these are given special protection.
- Environment Agency licences.

Please check with your local planning authority whether any of these apply to your site or your proposal.

## Sources of further information

Welsh Assembly Government	<a href="http://www.wales.gov.uk">www.wales.gov.uk</a> <a href="http://www.walescarbonfootprint.gov.uk">www.walescarbonfootprint.gov.uk</a>
Environment Agency Wales	<a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a>
Countryside Council for Wales	<a href="http://www.ccw.gov.uk">www.ccw.gov.uk</a>
Cadw	<a href="http://www.cadw.wales.gov.uk">www.cadw.wales.gov.uk</a>
Energy Saving Trust	<a href="http://www.est.org.uk">www.est.org.uk</a> Tel : 0800 512 012
Carbon Trust	<a href="http://www.carbontrust.co.uk">www.carbontrust.co.uk</a> Tel : 0800 085 2005
Microgeneration Certification Scheme	<a href="http://www.microgenerationcertification.org">www.microgenerationcertification.org</a>
Department for Energy and Climate Change	<a href="http://www.decc.gov.uk">www.decc.gov.uk</a>
Forestry Commission	<a href="http://www.forestry.gov.uk">www.forestry.gov.uk</a>
British Hydropower Association	<a href="http://www.british-hydro.org/index.html">www.british-hydro.org/index.html</a>
Micropower Council	<a href="http://www.micropower.co.uk">www.micropower.co.uk</a>
Renewable Energy Association	<a href="http://www.r-e-a.net">www.r-e-a.net</a>



## Publications available in this series

1	Generating Your Own Energy – A Planning Guide for Homes, Communities and Businesses
2A	Wind
2B	Solar Electricity
2C	Solar Water
2D	Hydropower
2E	Biomass
2F	Biomass (Anaerobic Digestion)
2G	Micro-CHP
2H	Heat Pumps
3	Generating Your Own Energy – The Current Planning Regulations

These documents can be found on our website at:

[www.wales.gov.uk/planning](http://www.wales.gov.uk/planning)



WG 13009  
ISBN 978 0 7504 6563 2  
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