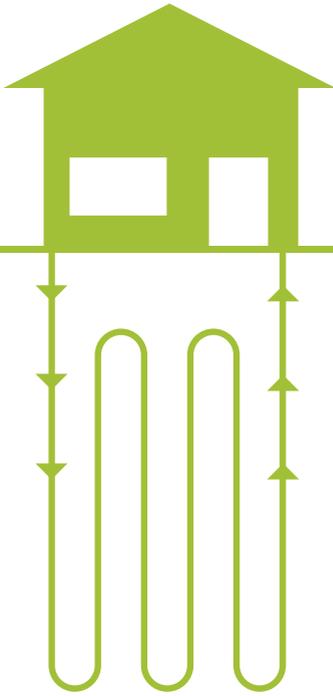




Llywodraeth Cymru
Welsh Government

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GENERATING YOUR OWN ENERGY HEAT PUMPS



2H



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

A planning guide for
householders, communities
and businesses

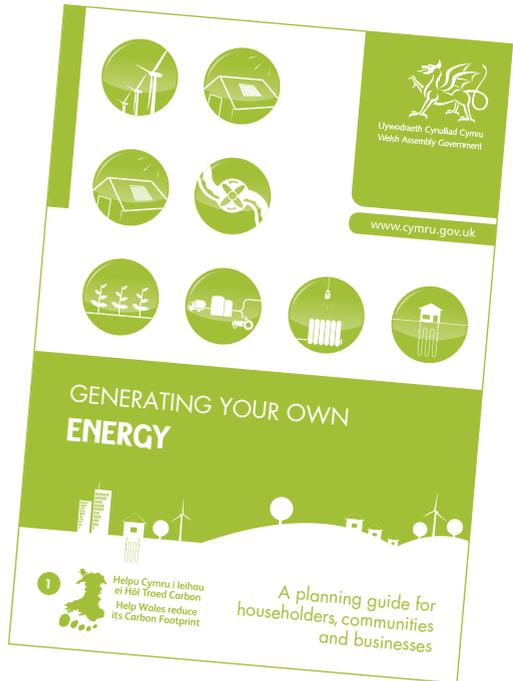
Introduction

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



What are heat pumps?

Heat pump systems extract the heat stored in the ground (ground source heat pumps), bodies of water (water source heat pumps) or air (air source heat pumps). This heat can then be used to heat the spaces in buildings, heat water or enable a building to be cooled.

Although all the heat delivered by heat pumps comes from renewable energy (stored solar energy), a supply of electricity is required to pump the system, which may or may not come from renewable sources. While heat pumps will need electricity to run, they will usually have a much lower carbon footprint than other heating systems.

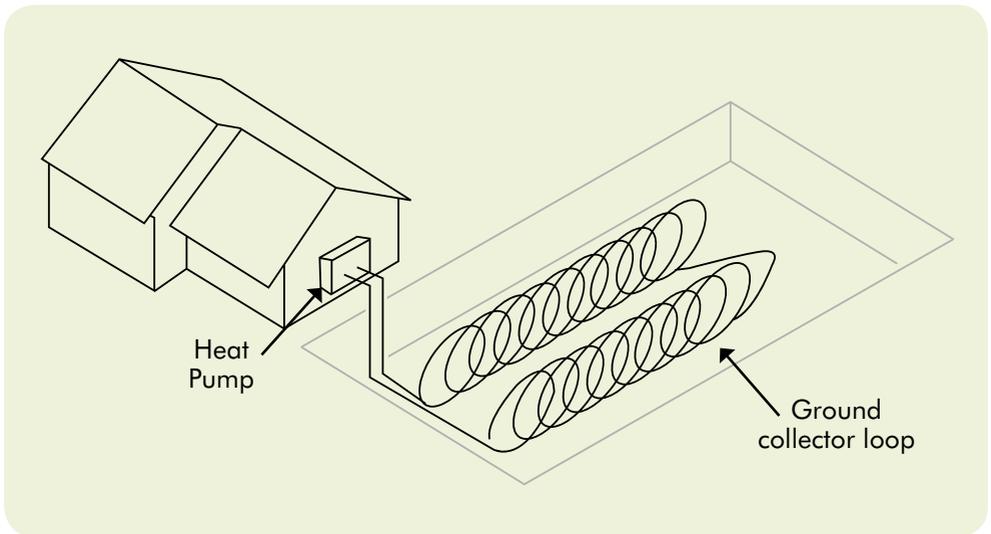


What is a Ground source heat pump?

Ground source heat pumps (GSHP) make use of the heat energy stored in the ground surrounding (or even underneath) buildings. Heat is taken out of the ground at a certain temperature and passed through a heat exchanger to release it into a building at a higher temperature.

A typical GSHP system has three major components:

- a heat pump (located within the building and similar in size to a large refrigerator),
- a ground collector loop (either pipes laid in trenches in the ground or vertical pipes within boreholes) and
- an interior heating or cooling distribution system.



Ground source heat pump

What is an Air source heat pump?

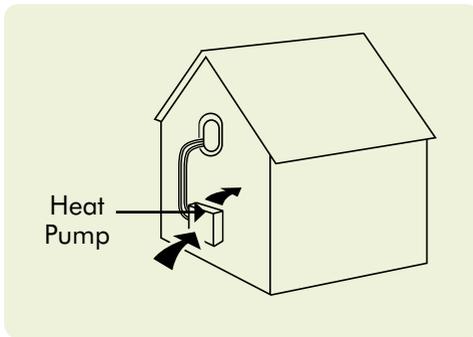
Air source heat pumps (ASHP) use the surrounding air as a heat source to heat a building. ASHPs tend to be much easier and cheaper to install than GSHP (as they do not need external heat collector loops), but are also usually less efficient.

They can either be mounted directly on an external wall or on the ground and are similar in appearance to conventional air-conditioning units.

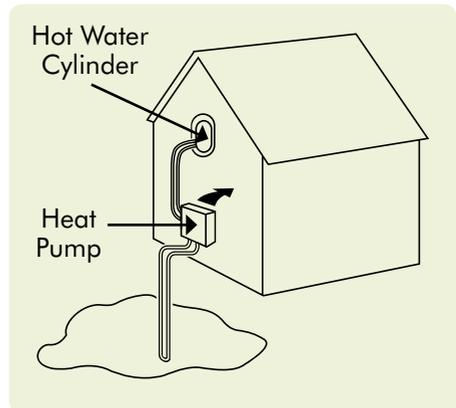
What is a Water source heat pump?

Water source heat pumps (WSHP) extract heat from large bodies of water or rivers (with a reasonably high flow volume in order to minimise any resulting changes in water temperature).

As with GSHPs, despite the relatively low temperatures of the water source, heat can be extracted from it in a heat exchanger to feed a low-temperature central heating system. An abstraction license from the Environment Agency is normally required.



Air source heat pump



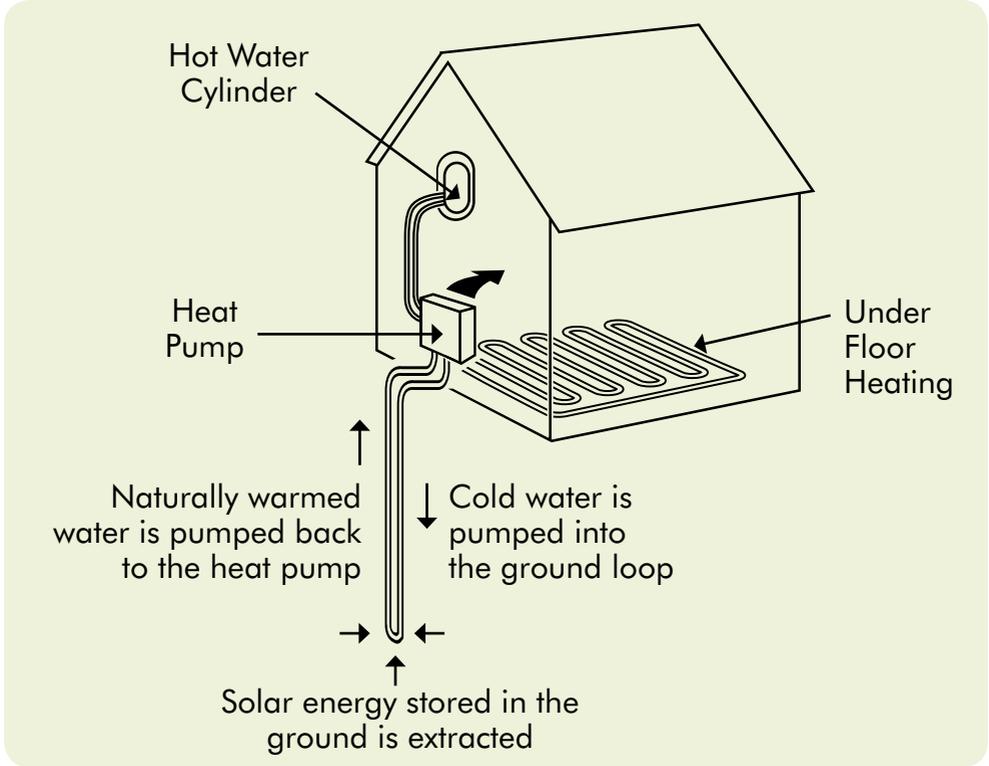
Water source heat pump

Do I need planning permission for a heat pump?

Details of the current planning regulations for the different types of heat pumps can be found in Leaflet **3 Generating Your Own Energy - The Current Planning Regulations** that accompanies this pack.



A ground source heat pump trench
(Credit: Thermal Earth Ltd)



What planning issues should I be aware of when considering installing heat pumps?

- There are economic, social and environmental impacts that should be considered when installing heat pumps. 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 heat pumps can minimise these impacts.
- The checklist provides some of these impacts and ways in which you can minimise them.

Heat pumps checklist

Issue	Impact	Ways to minimise the impact	GSHP	ASHP	WSHP
Landscape and visual	<ul style="list-style-type: none"> • Visual impacts on character of surrounding area. 	<ul style="list-style-type: none"> • Design (including colour and appearance) and siting of outdoor pump unit to minimise visual impacts. 		✓	



Heat pumps checklist (cont.)

Issue	Impact	Ways to minimise the impact	GSHP	ASHP	WSHP
Ecology	<ul style="list-style-type: none"> • Impact on biodiversity. • Disturbance to trees. 	<ul style="list-style-type: none"> • Appropriate siting. • Be aware of legislation protecting certain species/ designated sites. 	✓		✓
Hydrology	<ul style="list-style-type: none"> • Pollution of groundwater from leakage of additive chemicals used in heat pump system. 	<ul style="list-style-type: none"> • Seek advice of Environment Agency. 	✓		✓
	<ul style="list-style-type: none"> • Abstraction of water. • Disturbance of watercourses from excavation. 	<ul style="list-style-type: none"> • Seek advice from Environment Agency. 			✓



Heat pumps checklist (cont.)

Issue	Impact	Ways to minimise the impact	GSHP	ASHP	WSHP
Traffic and transport	<ul style="list-style-type: none"> • Access for drilling or excavation machinery. 	<ul style="list-style-type: none"> • Ensure safe access for machinery. 	✓		
Noise	<ul style="list-style-type: none"> • Increase in noise levels at nearby residences during operation. 	<ul style="list-style-type: none"> • Design scheme to incorporate anti-vibration mountings and acoustic insulation of heat pump / outdoor pump. • Appropriate siting to reduce impact. 	✓	✓	✓



Heat pumps checklist (cont.)

Issue	Impact	Ways to minimise the impact	GSHP	ASHP	WSHP
Geology	<ul style="list-style-type: none"> Borehole heat pumps may have an impact on local geology. 	<ul style="list-style-type: none"> Undertake geotechnical investigations. Seek advice from Environment Agency. 	✓		
Historic Environment	<ul style="list-style-type: none"> Direct impacts during construction on any unknown archaeological features. 	<ul style="list-style-type: none"> Undertake assessment of the archaeological potential of the site prior to commencement of construction work. Undertake trial trenching or archaeological watching brief during construction within sensitive sites. 	✓		



Heat pumps checklist (cont.)

Issue	Impact	Ways to minimise the impact	GSHP	ASHP	WSHP
Historic Environment	<ul style="list-style-type: none"> Visual impacts of outdoor pump on the setting of historic environment. 	<ul style="list-style-type: none"> Sensitive siting, high level of design quality, appropriate materials and colour treatment will be required. Where possible, external units should be installed where they will have the least visual impact such as to the rear of a property. 		✓	
Building Design	<ul style="list-style-type: none"> Structural impact on property (including neighbours) from excavations/ boreholes. 	<ul style="list-style-type: none"> Assess impact. Siting of system. 	✓		✓



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 of Sites of Special Scientific Interest (SSSIs), sites designated under the Ramsar Convention, Special Protection Areas (SPAs) or Special Areas of Conservation (SACs).
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	www.wales.gov.uk www.walescarbonfootprint.gov.uk
Environment Agency Wales	www.environment-agency.gov.uk
Countryside Council for Wales	www.ccw.gov.uk
Cadw	www.cadw.wales.gov.uk
Energy Saving Trust	www.est.org.uk Tel: 0800 512 012
Carbon Trust	www.carbontrust.co.uk Tel: 0800 085 2005
Microgeneration Certification Scheme	www.microgenerationcertification.org
Department for Energy and Climate Change	www.decc.gov.uk
Combined Heat and Power Association	www.chpa.co.uk
Micropower Council	www.micropower.co.uk
Renewable Energy Association	www.r-e-a.net



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



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