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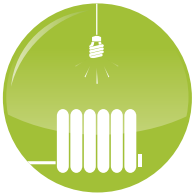


GENERATING YOUR OWN **ENERGY**

1

Helpu Cymru i leihau ei Hôl Troed Carbon

Help Wales reduce its Carbon Footprint

A planning guide for householders, communities and businesses

Climate change is happening now

We know that innovations such as the internet and mobile phones have transformed the way we live and, and similar innovations in renewable energy will produce a low carbon and resilient Wales. The Welsh Government is committed to making the future of Wales the best it can be, and we have set out ambitious commitments to tackle the causes and consequences of climate change in a sustainable way in the Climate Change Strategy for Wales.

Our approach sets the stage for Wales to be a leader, and to take advantage of all the opportunities which come with moving ahead in a changing world. However, we believe that unchecked climate change is one of the most serious threats the world faces because it threatens the basic elements of life for people around the world: access to water, health and food production.

We can do something about climate change, if all of us work together. As a society we need to reduce the greenhouse gases we produce through changing the way we produce and use energy.

Each of us can make different choices that can help reduce emissions or build resilience to the impacts of climate change. Generating renewable energy can help make your energy supply more secure, reduce your carbon footprint and also your energy bills over the longer term. This leaflet will help you decide the approach best suited to you.

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Starting Out

What is this pack?

This information pack is for householders, communities and businesses who want to generate their own energy through renewables. This may be to benefit from the Clean Energy Cashback Scheme (also known as the Feed-in Tariff) and to help tackle climate change.

Whatever your reasons, 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.

How to use this pack

The pack is organised into three separate parts

One	Starting out - This section (this booklet) provides a useful introduction to climate change and the ways in which you can reduce your carbon footprint through energy efficiency and renewable energy.
Two	Technology leaflets - A set of short leaflets for each of the renewable energy technologies to explain what the technology is, the main impacts that it may have and the ways in which you can reduce these impacts.
Three	Current planning regulations - For some of the small-scale technologies that you will be installing they will not require planning permission. This leaflet sets out the current requirements for a range of small-scale renewables.

Reducing Your Carbon Footprint

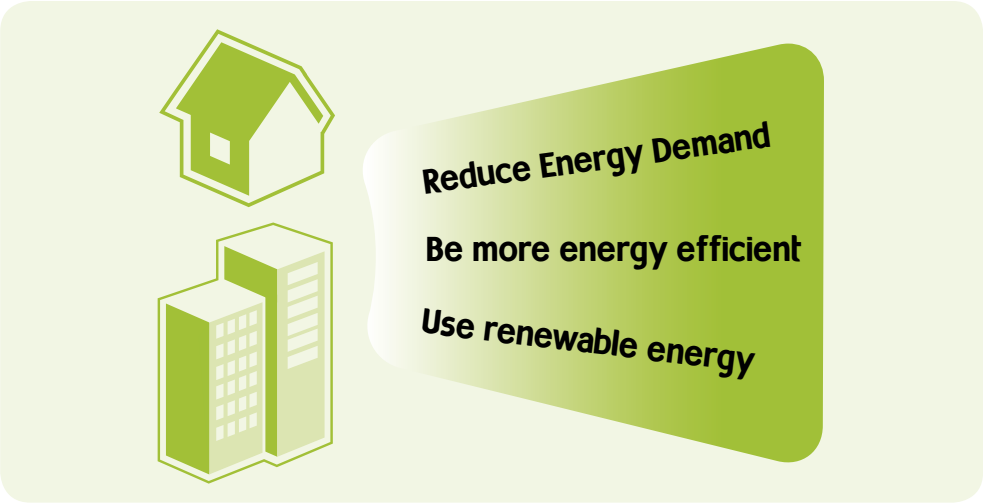
Helpu Cymru i leihau ei Hôl Troed Carbon

Help Wales reduce its Carbon Footprint

What should I do first?

If you, your community or business has decided that they would like to generate their own energy by installing renewable energy, you should first ensure that the homes and buildings that you are wishing to provide energy for are as **energy efficient** as possible. This means looking at the ways in which you can reduce the amount of energy your home or building requires.

Making energy efficient measures such as improving the insulation or upgrading to a high efficiency boiler can help maximise the use of energy, including any renewable energy you generate, and embed a lower carbon footprint into the fabric of your building.



Homes

Our homes are a major source of energy demand and there are a number of measures around the home which you can install to reduce its carbon footprint. These include insulation of roofs and walls, replacement boilers, draught proofing and using more efficient light bulbs and other appliances.

A householder's first port of call should be our **Improving Your Home: A Climate Change Guide** which provides a useful source of information for those considering making changes help tackle climate change by making your homes more resilient to climate change and reducing their overall carbon footprint.

Improving Your Home: A Climate Change Guide
www.wales.gov.uk/planning

Help Wales Reduce its Carbon Footprint

Find out about your carbon footprint and ways you can reduce it.
www.walescarbonfootprint.gov.uk

Energy Saving Trust

Reducing the CO_2 emissions from your home can also cut your fuel bills. You can get a free Home Energy Check from the Energy Saving Trust.
www.est.org.uk
Tel 0800 512012

Communities

We can also help to tackle climate change at a community level by working together to find ways in which we can reduce our carbon footprint. Action at a community scale can make energy savings or local energy generation more cost effective.

Supporting communities to take action to reduce their carbon footprint and become more self-sufficient in energy and other resources is a key part of tackling climate change in Wales. Community buildings such as village halls, schools and leisure centres offer a great opportunity to save energy. In the first instance this should include insulation, replacing old inefficient boilers and draught proofing of windows.

Our Community Action Pack sets out what actions communities can take to help tackle climate change, including how they can become more energy efficient. One example of this is through an energy audit of homes and other buildings to establish the potential for energy saving measures and generating their own energy.

Help Wales Reduce its Carbon Footprint

www.walescarbonfootprint.gov.uk

Energy Saving Trust

The Energy Saving Trust's Green Communities programme runs training session for communities on how to carry out an energy audit.

www.est.org.uk

Tel 0800 512 012

Businesses

Business properties are a major source of energy demand and there are a number of measures that you can make to reduce its carbon footprint. These include insulation of roofs and walls, replacement boilers, draught proofing and using more efficient light bulbs and other appliances and equiptment. Reducing the CO_2 emissions from your property can also cut your fuel bills.

Carbon Trust

The Carbon Trust Standard certify organisations that have measured, managed and genuinely reduced their carbon footprint and committed to making further reductions year on year.
www.carbontruststandard.com

The Carbon Trust also offers different types of Building Design advice to support you in developing a low carbon solution.
www.carbontrust.co.uk/wales
Tel 0800 085 2005

Generating Your Own Energy

What is renewable energy?

Renewable energy is energy from a source that is either unlimited (at least from our perspective) or which can be renewed without harming the environment. Included in this mix is low carbon energy which is energy from a non-renewable source but where the design of the system produced far less carbon emission than a traditional energy system.

Homes

Renewable energy systems can offer householders a sustainable solution to reducing their energy dependency and carbon footprint. These can range from small solar hot water panels placed on the roof to supplement the heating system to a wind turbine to supplement some of the electricity demand.

Communities

Renewable energy systems can offer a sustainable, low carbon solution to energy problems in many kinds of community situations. A typical community renewable project might be installing solar water heating panels on a school roof or the replacement of an old oil fired boiler with a wood pellet boiler in a village hall. Larger projects could see community ownership of a small number of wind turbines or a shared heating system serving a number of houses.

Businesses

Renewable energy systems can offer businesses a sustainable solution to reducing their energy dependency and carbon footprint. These can range from solar hot water panels placed on the roof to supplement properties heating system, a wind turbine to supplement some of the electricity demand or shared heating scheme between different business premises.

Technology types electricity / heat

Energy is needed in our homes and buildings to both **heat** and to provide **electricity**. Renewable energy technologies can be divided into those that provide heat and those that provide electricity. In some cases, such as combined heat and power units they can provide both heat and electricity.

Renewable energy technologies

Below is a short summary of the technologies that homes, communities and businesses are most likely to consider. A separate leaflet is available for **each** of these technologies where you can find more information on the technology and the planning issues you should be aware of when considering installing such technologies.

It is important to remember that an energy efficient building will require less energy to be generated from renewable energy, and consequently the costs of technology and ongoing maintenance will be reduced.

Wind Energy

Wind turbines convert the power within moving air mass (wind) into electricity by rotating a shaft. Small-scale wind turbines can be used to provide power to a single home, a school or a community building or an office development.

Solar photovoltaic

Solar energy involves the use of the sun's free energy to provide electricity using solar photovoltaic panels (PV). Solar PV requires daylight and not just direct sunlight to generate electricity. As such, power can be generated even on a cloudy day.

Solar water heating

These systems gather the sun's free energy and convert it into hot water alongside a conventional water heater. They can provide almost all of a buildings hot water during the summer months and a considerable amount all year around. They can be used for domestic water heating and also for larger scale applications such as swimming poolsand commercial properties.

Hydropower

These systems use the energy of falling water to turn a turbine that produces electricity. While it is perhaps one of the oldest method of harnessing renewable energy, modern system use turbines to convert the potential energy, stored in water held at a height to turn the turbine into electricity.

Biomass

Energy from biomass is produced from organic matter. It does not include fossil fuels, which have taken millions of years to produce. The CO_2 released during the generation of energy from biomass should be balanced by the CO_2 absorbed during the fuel's production, making it a carbon neutral process. There may, however, still be some CO_2 emissions associated with growth, processing and transport of biofuels. Small-scale applications of biomass can use either wood pellets, wood chips or wood logs.

Biomass (anaerobic)

Anaerobic digestion is the process of breaking down plant or animal matter such as farm slurry by microbial action in the absence of air. This produces a gas with high methane content. The methane is then burnt to produce heat, electricity or a combination of the two.

Combined Heat and Power (CHP)

These systems refer to the process of recovering heat generated during the production of electricity. In traditional power generation, the heat is wasted because it is released into the atmosphere via cooling systems.

With a CHP system, following power generation, the waste energy is used to heat water, which is then used for hot water supply and heating buildings through radiators or under floor heating.

Heat pumps

These systems take low level heat from either the air, water (such as ponds/lakes) or from under the ground to heat the space in a building, and in some cases pre-heat water. Water and ground source heat pumps involve circulating liquid along pipes in order to transfer the heat.

Technology sizes

Each of these technologies will come in various sizes depending on how they are manufactured. It may be possible to generate a significant proportion of a buildings' heat or electricity from renewable technologies.

Before you consider installing a renewable energy technology, it is very important to know **how much heat or electricity you currently use** before you select which renewable energy technology is suitable. This should be done after you have carried out energy efficiency improvements to the property to give an accurate picture of the amount of energy you need. The less energy you need, the easier it will be to meet a significant proportion through a renewable energy technology.

The easiest way to do this is to look at your annual utility bills which should show you how much heat and energy has been used.

In most cases only one unit would be suitable, such as one individual turbine or solar panel. However separate units may be combined together such as covering the roof of a village hall or a shop with an array of solar units.

Installers and products

It is recommended that you choose an installer certified under the Microgeneration Certification Scheme. This will be a requirement if you are applying for the Clean Energy Cashback Scheme and Renewable Heat Premium Payment (see page 16).

You can check whether an installer or product is MCS certified or find a local installer by going to the MCS website (www.microgenerationcertification.org) or by calling an Energy Saving Trust advisor.
www.est.org.uk Tel 0800 512 012

Planning

Planning permission is required for various types of development. Unless wholly inside an existing building in most cases installation, alteration or replacement of a renewable energy technology would be considered as development for the purposes of planning, and therefore require you to apply to your local planning authority (council) for permission.

However in some cases there are some types of development that do not require planning permission - this is called permitted development. Some micro-generation renewable energy technologies have been given this status, please take a look at Leaflet **3 Generating Your Own Energy - The Current Planning Regulations** for further information.

The Planning Portal

The Planning Portal is the first port of call for anyone wanting to find out about the planning system in Wales. The portal provides a one-stop-shop supplying answers, services and information to anyone involved in the planning process. It is supported by the Welsh Government.

The Planning Portal has developed an interactive house which provides visual guidance on many common householder projects, including micro-generation projects.

www.planningportal.gov.uk

Other approvals

It is also important to recognise that there may be other permissions and consents needed, depending on your renewable energy system 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 (Please contact Countryside Council for Wales, www.ccw.gov.uk).
- Environment Agency licences.

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

Funding

There are various sources of funding opportunities across Wales, some of these include:-

The Clean Energy Cashback Scheme (Feed-in Tariffs)

From 1st April 2010 householders, communities and businesses who generate their own electricity from renewable or low carbon sources can obtain regular payments from their energy suppliers. The scheme was introduced to encourage the take up of these technologies to help tackle climate change.

The scheme guarantees a minimum payment for all electricity generated by the system, as well as a separate payment for the electricity exported to the grid. Those who take up the scheme can expect a monthly reduction in their electricity bill and an income from their clean energy cashback provider.

Small-scale low-carbon electricity technologies currently eligible for FITs include :

- Wind
- Solar photovoltaics(PV)
- Hydro
- Anaerobic Digestion; and
- Domestic scale micro CHP.

In order to benefit from the scheme technologies have to be certified with the Microgeneration Certification Scheme (MCS) and must be installed by an MCS accredited installer.

The payment for the Feed in Tariff only covers certain technologies up to a certain size (5MW).

Renewable Heat Premium Payment

The Renewable Heat Premium Payment is a scheme to support people who want to install renewable heat technologies. It provides a grant to qualifying technologies. The scheme will run from 1st August 2011 to 31st March 2012.

Individuals who own their own property and reside within Wales can apply for installations at their primary residence. If you rent your property privately, you will need to approach your landlord as you may need to work with them to apply for the scheme.

You can apply online by going to the Energy Saving Trust website www.est.org.uk

You will be expected to install appropriate energy efficiency measures to be eligible for a voucher. Please contact an Energy Saving Trust advisor on 0800 512 012 for further information.

Renewable Heat Incentive

The Renewable Heat Incentive will provide payments over a set period of time to generators of renewable heat. It starts in November 2011 for industrial, commercial and public sector installations. It is expected that this will be rolled out to households in 2012.

Please read the leaflet 3 **"Generating Your Own Energy - Current Planning Regulations"** for information on whether you require planning permission for these technologies.

For further information on these schemes please contact:

For householders and communities Energy Saving Trust
www.energysavingtrust.org.uk/Generate-your-own-energy
Tel 0800 512 012

For businesses
Carbon Trust website
www.carbontrust.co.uk/wales
Tel 0800 085 2005

Nest

The Welsh Government funded scheme offers advice and support to help improve the energy efficiency of homes across Wales. Nest is targeted at those households on the lowest incomes and in the most inefficient homes. In order to qualify for Welsh Government funded measures, households must be on a means tested benefit and in an F or G rated property (SAP 39 or less). If a household is eligible they will receive a whole house assessment, which will consider what the best options for the property are.

The scheme can give you advice on:

- energy efficiency;
- energy tariffs; and
- maximising your income

Contact Nest for advice on what support may be available for you.
www.nest.org.uk
Tel 0800 512 012

Ynni'r Fro

(Community Scale Renewable Energy Generation Programme) Ynni'r Fro is a Welsh Government project to develop 22 community scale renewable energy projects across Wales. The project also offers a development officer service to help build community capacity, provide technical advice, help communities secure funding, identify training needs, and take communities through planning and licensing regimes. For more information please contact the Energy Saving Trust.

Carbon Trust Business Loan

The Carbon Trust provides interest-free loans to companies to invest in energy saving equipment. For more information see www.carbontrust.co.uk/wales

Carbon Trust Surveys

A Carbon Trust free* on-site survey guarantees to identify quick and effective ways to reduce energy, typically yielding a 20% cute in a business's energy costs. Carbon Trust will carry out a survey of your site to assess the potential for energy savings.

* The Carbon Trust offer free on-site surveys up to £3,000,000 group energy spend per annum for applicants in Scotland, Wales and Northern Ireland.

Carbon Trust Events

The Carbon Trust delivers a wide range of interesting free events to local business with the aim to educate people in business in the drive towards a low carbon economy. To find out more visit www.carbontrust.co.uk/wales

Local authorities

Most councils have programmes supporting energy efficiency improvements in local housing. Contact your local council for details.

Electricity and Gas Supply Companies

All energy suppliers have a statutory obligation to reduce carbon emissions by investing in measures in customers' homes. The Energy Saving Trust offer free and impartial advice on the offers available from energy suppliers.

Ysgol y Graig
(Credit: Dulas Ltd)

Further Information

Wales Carbon Footprint

This site allows you to calculate your carbon footprint and get advice on how you can help tackle climate change, and has a range of resources for community groups.

www.walescarbonfootprint.gov.uk

The Carbon Trust

Provides impartial advice for businesses on energy saving and reducing your carbon emissions.

www.carbontrust.co.uk

Tel 0800 085 2005

Energy Saving Trust

Provides impartial advice on energy saving and reducing your carbon emissions on its website where you can download leaflets and information about many of the technologies and funding available.

www.est.org.uk

Tel 0800 512 012

Adult Education Centre, Machynlleth
(Credit: Dulas Ltd)

Solar Clubs

There are five Solar Clubs covering the whole of Wales that provide support to people wanting to do DIY installations of solar hot water systems.

www.ecodyfi.org.uk/energy/dyfisolarclwb.htm

Centre for Alternative Technology (CAT)

Based in Machynlleth, Powys, CAT has full scale demonstrations of all these technologies and provide an extensive range of publication and information leaflets.

www.cat.org.uk

(Credit: Amgen)

(Credit: Amgen)

Welsh Government's Climate Change website

This provides policy information on what the government is doing to tackle climate change in Wales.

www.wales.gov.uk/climatechange

Cynnal Cymru - Sustain Wales

Their website has a wealth of information about sustainable living, as well as a directory of organisations, projects, help and support available where you live.

www.sustainwales.com

Environment Agency

The environment agency of England and Wales' website contains lots of information of how climate change will impact on Wales and some of the ways in which you and your community can respond.

www.environment-agency.gov.uk

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

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

This document has been prepared by the Welsh Government.

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