

Microgeneration

Quick Guide

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What is Microgeneration?

Microgeneration is a term used for the generation of low, zero or renewable energy at a 'micro' scale¹. It includes the small-scale generation of energy (heat and electricity) by individuals, small business and communities to meet their own needs.

Under the *Energy Act 2004*² microgeneration is defined as having a capacity of 45kW for micro-heat (thermal) and 50kW for micro-electricity. Microgeneration can also refer to community scale energy which may fall within these capacities.

Microgeneration technologies can be grouped in to two categories:

- Micro-electricity technologies – including solar photovoltaic (PV) or solar panels, micro-wind turbines, micro-hydro and micro-combined heat and power (CHP).
- Micro-heat technologies – including heat pumps, biomass and solar thermal.

The main renewable source currently being microgenerated in Wales is solar energy³.

Micro-electricity Technologies

Solar Photovoltaic (PV) or solar panels

PV solar cells/panels are renewable electricity-generating systems which are installed at an optimal angle on a supporting roof or wall. Under stronger sunlight more electricity is produced; however electricity is still produced under overcast conditions.

Micro Wind turbines

Micro wind turbines generate renewable electricity from wind. Rotor blades are aerodynamically engineered to take optimal power and then turn a turbine to generate electricity. The amount of energy created depends on the strength of the wind. Small-scale turbines can either be integrated into the local electricity grid or operate as off-grid devices, charging batteries when excess electricity is generated.

Micro Hydro

Micro-hydro turbines generate renewable electricity from water. Energy in water at height or falling water rotates turbines to generate electricity. The amount of electricity produced depends on the speed of water flow and the vertical distance the water falls. Turbines can be installed in rivers or man-made installations such as reservoirs.

¹ Department of Energy and Climate Change, **Microgeneration** [accessed 15 June 2012]

² Energy Act 2004, Part 2, Chapter 1, Section 82 **Microgeneration** [on 15 June 2012]

³ Welsh Government, **Microgeneration** [accessed 15 June 2012]

Micro Combined Heat and Power (CHP)

Micro CHP is a small onsite technology which uses one fuel, for example gas, to produce heat and also electricity. The technology is considered as low carbon as it is more efficient than the typical burning of fossil fuels for heat and electricity. This technology is generally considered suitable for a wide range of sizes and applications, including domestic boilers.

Micro-heat Technologies

Heat pumps (ground, water and air source)

Heat pumps can be split in to three categories: Air source heat pumps, ground source heat pumps and water source heat pumps.

Air source heat pumps (ASHP) are a low-carbon heat technology which has a unit positioned on or near the outer wall of a building. It uses a fan to extract ambient heat from the outside air.

There are two types of ASHP:

- An air-to-water system which uses heat to warm water.
- An air-to-air system produces warm air, which is circulated by fans.

Ground source heat pumps are low-carbon heat-generating systems that usually circulate a mixture of water and antifreeze round a loop of pipe buried in the ground⁴. When the liquid is pumped around the loop, it absorbs thermal heat from the ground. This heat can be transferred to radiators and under floor heating systems and it can heat water.

Water source heat pumps operate on a similar basis to ground source heat pumps but the coils are in water, e.g. a pond or river.

The energy sources used within these heat pumps is solar energy stored in the surface of the ground, water or air.

Biomass (wood-fuelled heating systems)

Wood fuelled heating systems generally burn wood pellets, chips or logs to power central heating and hot water boilers or to provide warmth in a single room. There are two main ways of using wood to heat your home:

- A standalone stove burning logs or pellets to heat a single room. Some can also be fitted with a back boiler to provide water heating as well.
- A boiler burning pellets, logs or chips connected to a central heating and hot water system.

Log burning stoves and boilers have to be filled with wood by hand. Some pellet and chip burners use automatic fuel feeders which refill them at regular intervals from fuel storage units called hoppers.

Solar thermal

Solar thermal is a renewable energy system for generating domestic hot water. It generates renewable heated water using solar panels (collectors) fitted at an optimal angle on a roof. Solar thermal should work all year round during the day but consumers are likely to need to heat water further in winter months using a boiler or immersion heater.⁵

⁴ Department of Energy and Climate Change, **Micro-Heat** [accessed 15 June 2012]

⁵ Department of Energy and Climate Change, **Solar Thermal** [accessed 15 June 2012]

UK Government Incentives

Financial incentives for energy are non-devolved.

As part of the UK Government's *2006 Microgeneration Strategy*⁶, the **Microgeneration Certification Scheme (MCS)** was introduced. The MCS is a scheme that impartially certifies microgeneration products and installers in accordance with consistent standards in order to provide greater protection for consumers. Whilst the MCS is a voluntary scheme, in order to qualify for grants such as the Feed-in Tariff, both the microgeneration product and the installer must be MCS approved.

The **Feed-in Tariff (FIT)** scheme⁷ is an environmental programme introduced by the UK Government to promote the uptake of small-scale renewables and low-carbon electricity generation. It commenced on 1st April 2010 and supports domestic, commercial, industrial and community installations. Owners of eligible systems will be paid a set amount (the Generation Tariff) for every kilowatt hour of electricity generated, whether they use it or export it to the grid. They will also receive a lower price (the Export Tariff) for every unit exported to the grid⁸. The FITs replaced the previous system of government grants. The **FIT scheme** is administered by Licensed Electricity Suppliers and **Ofgem**⁹, whilst public information on the scheme is provided by the **Energy Saving Trust**¹⁰ on behalf of the UK Government.

The **Renewable Heat Incentive (RHI)**, administered by **Ofgem**, aims to provide financial support and incentives to individuals, communities and businesses, to switch from a heating system powered by fossil fuels to a renewable energy system. Owners of eligible heat technologies will be paid an annual sum to reflect the amount of renewable heat they are deemed to have used¹¹. Additionally, the Energy Saving Trust will be administering the Renewable Heat Premium Payment scheme as part of the RHI.

The RHI is being introduced in two phases:

- Phase 1: introduction of the Renewable Heat Premium Payments (RHPP) scheme to households and also the introduction of the RHI for non-domestic installations in the industrial, business and public sectors. Both of these have been introduced.
- Phase 2: the domestic element of the RHI is expected to be introduced in the summer of 2013.¹²

The **Renewable Heat Premium Payment (RHPP)** is a UK Government scheme designed to assist in the cost of renewable technologies for domestic properties. It provides a one-off grant designed to help meet the cost of installing domestic renewable technologies until the Renewable Heat Incentive (RHI) is introduced for domestic customers. The amount of funding received is dependent on which technology is being installed. Phase 2 of the RHPP will run from 1st May 2012 to 31st March 2013, subject to available funding. The financial support covers solar thermal panels, heat pumps (excluding air to air and exhaust air heat pumps) and biomass boilers. More information relating to the RHPP can be found on the **Energy Savings Trust** website.

⁶ Department for Business, Innovation and Skills, **Microgeneration Strategy 2006** [accessed 15 June 2012]

⁷ Department of Energy and Climate Change, **Feed-in Tariffs** [accessed 27 June 2012]

⁸ Energy Savings Trust, **A buyer's guide to renewable and low carbon technologies** [accessed 15 June 2012]

⁹ Ofgem, **Feed-in Tariff** [accessed 27 June 2012]

¹⁰ Energy Saving Trust, **Feed-in Tariff Scheme** [accessed 27 June 2012]

¹¹ *ibid*

¹² Energy Saving Trust, **Renewable Heat Incentive** [accessed 15 June 2012]

The UK Government has not yet published its proposals for how the Renewable Heat Incentive will work in the domestic sector, so there is no guarantee at this stage that anyone who is eligible for a Renewable Heat Premium Payment grant will also be eligible for the Renewable Heat Incentive. A UK Government consultation on this is expected in September 2012.¹³

Further information

For further information about **Microgeneration**, please contact **Lisa Llewellyn** (Lisa.Llewellyn@Wales.gov.uk), Research Service.

See also:

- Welsh Government **Microgeneration**
- Energy Saving Trust **Generate Your Own Energy**
- Carbon Trust **Renewables**
- Microgeneration Certification Scheme **website**
- Department for Energy and Climate Change **Microgeneration**
- **Renewable Heat Incentive: Ofgem's role**

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¹³ Energy Saving Trust, **Renewable Heat Incentive** [accessed 15 June 2012]