

## Generating energy

Treating water for drinking, supplying it to customers and cleaning up the waste water needs a lot of energy. In 2014 Welsh Water used 470 million kWh of energy, mainly electricity and its annual carbon emissions were around 260,000 tonnes CO<sub>2</sub>/year. However, energy can also be generated from its activities...

### Anaerobic Digestion

When the waste water we collect from people's homes and businesses is cleaned up, the clean water goes to the river or sea and we are left with the sludge. This can be broken down biologically in a digester to release bio-methane gas, which is 65% methane. The gas can then be used to generate green electricity which is used to power equipment on the works, and heat which is used to keep the digester at its optimum temperature. On our sites at Cardiff and Port Talbot we have introduced an advanced version of this technology (known as thermal-hydrolysis), producing even more gas and electricity. In 2015 we produced almost 40 million kWh of energy from anaerobic digestion.

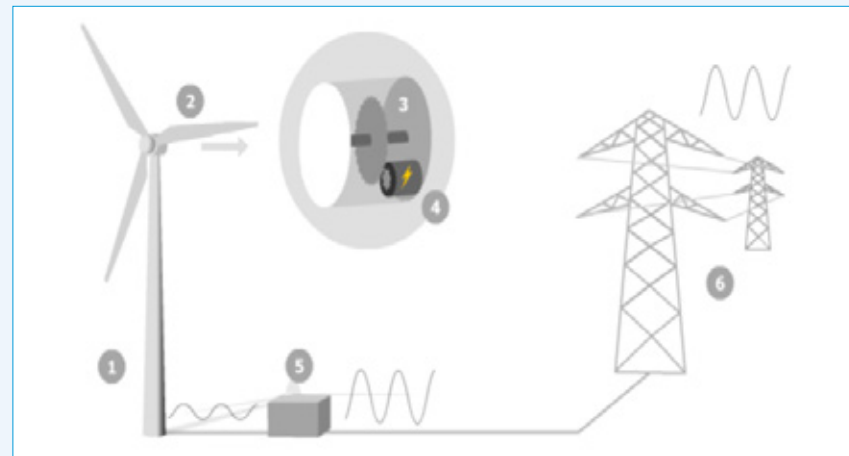


Anaerobic digestion and thermal hydrolysis plant at a Waste Water Treatment Works in Cardiff.

### Wind turbines – How it works

Wind energy is one of the cheapest forms of renewable generation but comes with many planning restrictions. Welsh Water has consent for the first units to be installed on two of its sites which we expect to complete in 2016/17.

1. The wind turns the blades.
2. The blades turn a shaft inside the nacelle (the box at the top of the turbine).
3. The shaft goes into a gearbox which increases the rotation speed.
4. The generator converts the rotational energy into electrical energy.
5. The transformer converts the electricity from around 700 Volts (V) to the right voltage for distribution, typically 33,000V.



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The best way of saving money and energy is not to use it in the first place and Welsh Water have an ongoing programme of energy efficiency schemes. When equipment is replaced it is with more energy efficiency equivalents and control systems are upgraded so that less energy is used to achieve the same operational standards. In recent years we have changed thousands of lights refurbished or replaced pumps, blowers and installed online meters at almost all our 3600 locations to help identify further energy saving opportunities.

### Hydro-electric power

As a water company we are keen to generate electricity from the water itself as it makes its way out of our reservoirs and through our pipes. Hydro-turbines can be found on our largest reservoirs as well as on smaller sites such as water treatment works. Hydro-turbines use the natural force of the water falling under gravity, which would otherwise go to waste. They can be expensive but once installed are low maintenance and will generate renewable energy for many years. In 2015 we produced around 45 million kWh from hydro.



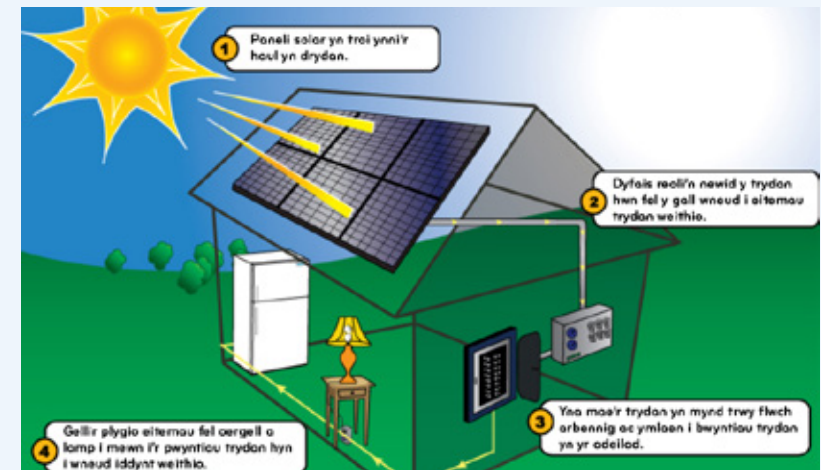
Hydro turbine at Elan valley.



Cowlyd – small, new hydro in Snowdonia.

### Solar photo-voltaic generation

Solar panels are a common sight on many buildings and Welsh Water is no different. New or renovated buildings have solar panels included in their re-design wherever possible. Unused space on operational works has also been utilised for ground mounted schemes. In 2015 we will generate around 4 million kWh from solar.



Astudiaeth achos: Parc Ynni Dŵr Gwastraff Pum Rhyd - [Cliciwch ymo](#)