



## Bradford Council - Environment and Climate Change Unit

### Information Factsheet: Renewable Energy

Renewable energy offers an alternative to fossil fuels and can help reduce your homes CO<sub>2</sub> emissions. If you have reduced your energy use and are using energy efficiently, the next step could be generating your own energy using renewable energy. There are various technologies available but not all will be suitable for all buildings.

#### Solar Power

Solar power takes energy from the sun and uses this energy to heat water or generate electricity.

Solar panels are great for south facing roofs as these roofs get the most sunlight. Panels also need to be tilted at an angle of about 35° (about the same as the average pitched roof) in order to catch the most sun. Solar panels don't like shade, even slight shadows cast by nearby buildings or trees can make them ineffective.

#### Solar Photovoltaics (PV) – Electricity

PV panels are made up of a set of solar 'cells' that are connected to each other. When light falls on a cell, electricity is produced. This electricity is then fed into an 'inverter' which changes the power from direct current to alternating current, which is the kind of electricity used by appliances like fridges or TVs.

#### Solar Thermal – Hot Water

Solar thermal panels are shallow boxes with glass (or clear plastic) covers. They are insulated and designed to absorb the heat of the sun like a highly efficient mini-greenhouse. Inside the panel are pipes filled with a mixture of water and antifreeze. On a very sunny day the liquid get very hot. The hot liquid is pumped into a heat exchanger inside a hot water tank which stores the water you're going to actually use. The heated up mixture of water and antifreeze never comes into contact with the water in the tank. But it does cause it to heat up, and by so doing provides hot water for showers, baths, washing up.

For more information visit:  
[www.bradford.gov.uk/climatechange](http://www.bradford.gov.uk/climatechange)  
email: [eccu@bradford.gov.uk](mailto:eccu@bradford.gov.uk)

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### Wind Power

Wind turbines work by converting a portion of the energy in wind into rotational motion. This is then converted into electricity by a generator. Wind turbines need to be sited in windy places. The best sites are those with an average annual wind speed of at least 5 metres per second and with an unobstructed flow of wind.

### Hydro Electricity

Hydroelectricity systems generate electricity from running water - usually a small stream. Hydroelectricity systems are also called hydro power systems. Micro hydro systems can generate enough electricity for lighting and electrical appliances in a home, often with plenty of surplus to sell back to the grid.

### Biomass

Biomass is a burnable material derived from wood or other plants, such as wood chips. To generate energy from biomass, it is burnt. The heat produced by burning the wood chips, logs, or other biomass, is used directly for room or water heating.

A wood fuelled heating system would be a good option to consider if you have no access to natural gas and you have sufficient space for the boiler and fuel storage.

### Heat Pumps

Heat pumps work by capturing the energy from the sun that has slightly warmed either the earth, water or the air. Even on a cold winter day, the temperature underground or at the bottom of a river remains constant, at about 10°C. Heat pumps are able to extract this warmth through a series of coils filled with a liquid which picks up heat from the surrounding earth or water. It is then passed through a device called a compressor which pressurises the liquid and raises its temperature to about 40°C. This heat is transferred to the water in your heating system via a heat exchanger.

### More Information

Energy Saving Trust [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)

PlanLoCaL [www.planlocal.org.uk](http://www.planlocal.org.uk)

For more information visit:  
[www.bradford.gov.uk/climatechange](http://www.bradford.gov.uk/climatechange)  
email: [eccu@bradford.gov.uk](mailto:eccu@bradford.gov.uk)

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