

## Solar clubs

Solar Clubs are non-profit making ventures that exist to help people fit solar thermal hot water systems for themselves. With the range of discounts the clubs have been able to negotiate, the costs can be cut to around £1500 for a typical DIY installation. Grants are not normally available for DIY installed systems.

Surrey Solar can be contacted through the Energy Conservation and Solar Centre (ECSC).



**Energy Conservation and Solar Centre (ECSC)**

Tel: 0800 512 012

Web: [www.ecsc.org.uk](http://www.ecsc.org.uk)

For a list of current solar clubs contact The Centre of Alternative Technology.



**The Centre of Alternative Technology**

Tel: 01654 702 400

Web: [www.cat.org.uk](http://www.cat.org.uk)

## Improving and decorating your home

### ▶ Renewable energy and low carbon heating

We can lessen the impact of heating and powering our homes by choosing renewable energy systems or low-carbon energy supplies.

Renewable energy that is zero carbon producing can be considered to be climate change neutral as it does not produce any climate change emissions.

#### Solar energy systems

Ultimately the sun is the source of nearly all energy on earth. We use the sun's heat and light in our homes daily,

as it warms the fabric of the building and lights our rooms. New houses can be designed to trap more of this **passive solar energy** by addition of south facing conservatories, for instance, which can reduce the demand for heating.

**Active solar energy** uses special collectors, to trap the sun's heat – known as solar water heating – or convert sunlight to electrical energy by means of **photovoltaic cells**. Both of these methods are available for domestic use.

Planning permission is not normally needed except for conservation areas and listed buildings – although you should check with your Local Authority before proceeding with the installation.



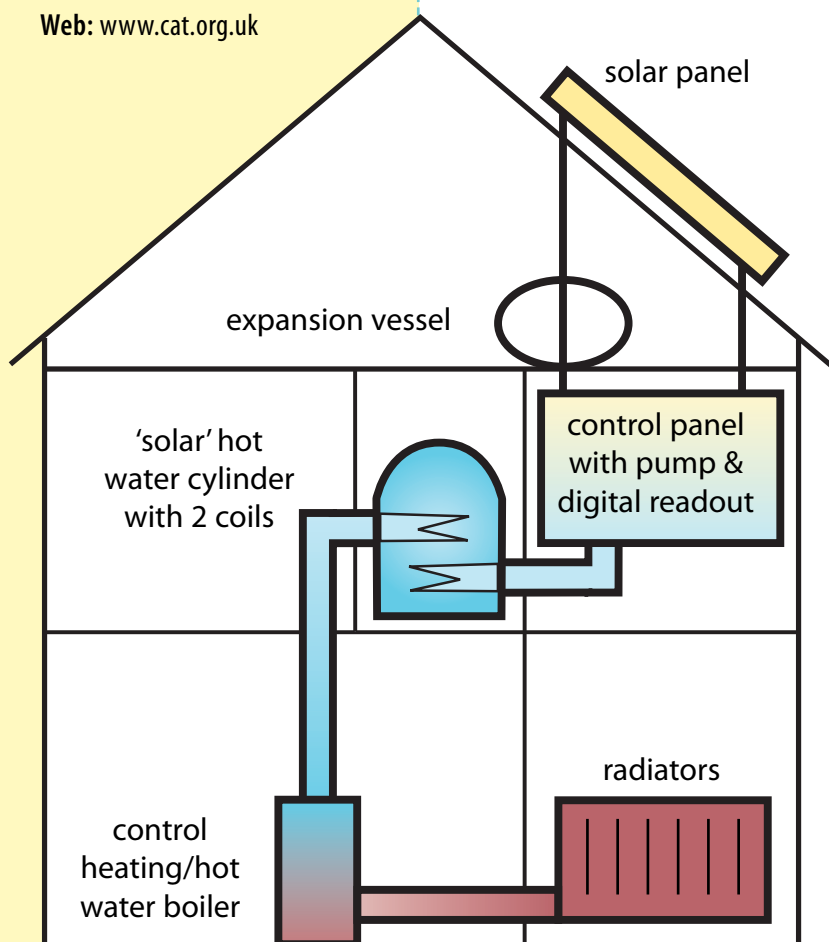
Tel: 01483 743843 or visit

Web: [www.woking.gov.uk/council/planning](http://www.woking.gov.uk/council/planning)

#### Solar water heating

A solar system usually preheats water entering your conventional hot water system. They are based on simple technology with few moving parts. The modern units are quiet and include control systems that maximize the amount of the sun's energy converted to hot water.

A south-facing roof is best for solar water heating but if your roof faces anywhere between east and west it can still be considered. A collector can be fitted on a flat roof and angled in a suitable direction. A 3m<sup>2</sup>- 5m<sup>2</sup> area will be needed for an average household.



Source: Sustainable Energy Action

## Improving and decorating your home

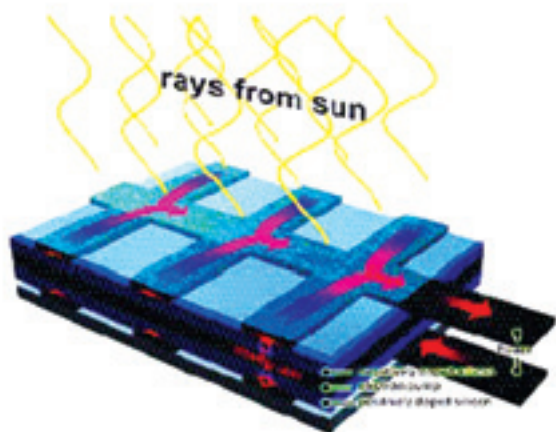
Carefully-designed systems can provide up to 100% of your heated water needs through most of the summer, and even in winter on a cloudy day could still provide up to 20% of the heat required for hot water.

There are many solar water heating system installers in the UK and it would be wise to get quotes from several. (Solar Trade Association, Centre for Alternative Technology and DTI have lists of approved installers). Typical current costs for installation are £3,000 per system, but if installed by DIY costs could be as low as £1,500 (see information opposite on solar clubs). A typical installation takes just three days, and can last up to 20 years with little maintenance.

At current energy prices annual savings of £80 - £160 would be expected but this will increase as energy prices escalate.

Grants are available for professionally installed systems through the DTI's 'Clear Skies' scheme: call 08702 430930 or visit [www.clear-skies.org](http://www.clear-skies.org)

### How a solar cell works



Source: Solar Century Ltd.

## Photovoltaics: electricity from solar energy

Photovoltaic (PV) technology generates electricity from light. It needs only daylight, not sunshine, to work and will generate electricity whatever the weather. Installing a solar PV roof could prevent over 34 tonnes of greenhouse gas emissions during its lifetime.

If every suitable roof in the UK was fitted with PV, we could exceed the nation's current electricity demand. By investing in solar power you will be leading the world into this era of clean energy.

A solar home could be your energy solution to the wider environmental problem of climate change. Silent and maintenance free, a solar roof not only protects your home from the elements as it forms part of the roof, it also produces clean electricity helping to protect generations to come.

This technology at present seems expensive to the average person and the pay-back period is long for installing a PV roof. However, as more and more people start to install PV the unit price should decrease, and power companies are now starting to buy back any excess or off-peak electricity generated by PV roofs

PV tiles are more expensive than panels but they can be fitted into a roof (particularly slate type) and be less obvious than a panel.

A typical installation takes between three and five days, with minimal fuss, and involves connecting the system to the local utility network.

Current costs are approximately £6000 per installed kW for a roof panel system. (A typical house uses about 1 - 2 kW), with savings of up to £120 per year.



### The solar potential of your home

- ▶ **Location:** Your roof must not be shaded by objects such as trees or buildings.
- ▶ **Orientation:** Solar PV works on all roofs, but is most effective on those facing south, south-east and south-west. In the UK, a north-facing PV roof will generate about 60% of the output of a similar south-facing one.
- ▶ **Inclination:** PV products are suitable for pitched, flat and curved roofs, although the optimal roof angle is 30° - 40° for the UK.
- ▶ **Available area:** The more surface area available, the greater the power potential. For a grid-connected system the minimum required area is approximately 10m<sup>2</sup>.

- ▶ **Planning permission:** PV roofs do not usually require planning permission unless the building is listed or in a conservation area. However, you should always check local Council policy.



#### Woking Borough Council

Tel: 01483 743843

or visit [www.woking.gov.uk/council/planning](http://www.woking.gov.uk/council/planning)

## Energy |

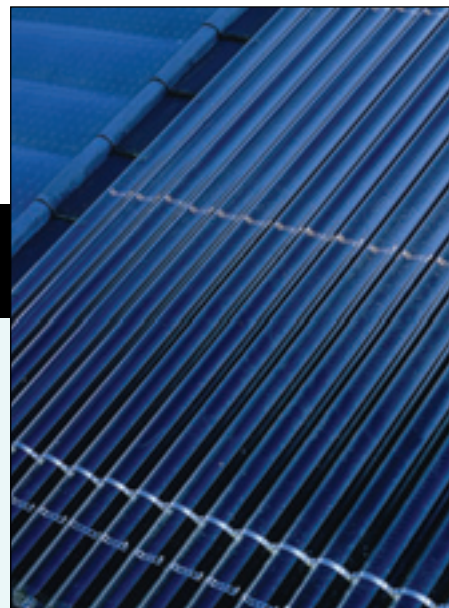
**The solar potential of your home****BENEFITS**

- ▶ Your own **clean power** source that helps reduce global warming
- ▶ Reduces your **electricity bills**, since daylight is free
- ▶ Increases the **value of your property**
- ▶ Extremely **low maintenance**, with long functional **lifetime** of 30 years or more
- ▶ High **reliability**
- ▶ **Silent** in operation and visually **unobtrusive**
- ▶ The solar meter tends to increase your **awareness of electricity use**, and encourages more energy efficient behaviour



## Improving and decorating your home

Government grants may be available for up to 50% of cost of the installation: for details contact Energy Savings Trust.



### ➤ MORE INFO ON SOLAR ENERGY

➤ **British Photovoltaic Association**  
Trade association of PV manufacturers and installers; provide general information and lists of reputable installers.  
Tel: 01908 442291  
Web: [www.pv-uk.org.uk](http://www.pv-uk.org.uk)

➤ **Centre for Alternative Technology**  
Books, leaflets and factsheets on all aspects of solar energy, and lists of installers.  
Tel: 01654 702 400  
Web: [www.cat.org.uk](http://www.cat.org.uk)

➤ **DTI**  
The Government Department of Trade and Industry, which funds Clear Skies grant scheme for domestic solar water heating systems. Reports available on comparative tests of solar systems.  
Tel: 08702 430930  
Web: [www.clear-skies.org](http://www.clear-skies.org)

➤ **Energy Efficiency Advice Centre**  
Free, impartial advice on solar energy and other aspects of energy use in your home Surrey and East Sussex Energy Efficiency Advice Centre (EEAC).  
Tel: 0800 512 012  
Email: [surr@eeac.net](mailto:surr@eeac.net)  
Web: [www.ecsc.org.uk](http://www.ecsc.org.uk)

➤ **Energy Saving Trust**  
Government-sponsored organisation providing general information on all energy saving measures and grants for PV installations.  
Tel: 020 7222 0101  
Web: [www.energysavingtrust.co.uk](http://www.energysavingtrust.co.uk)

➤ **National Energy Foundation**  
For information on photovoltaic and solar water heating, and lists of suppliers.  
Web: [www.greenenergy.org.uk](http://www.greenenergy.org.uk)

➤ **Solar Energy Society**  
Web: [www.solarline.co.uk](http://www.solarline.co.uk)

➤ **Solar Trade Association**  
Solar water heating installers/manufacturers' association whose members subscribe to codes of ethical conduct.  
Tel: 01908 442290  
Web: [www.solartradeassociation.org.uk](http://www.solartradeassociation.org.uk)

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## | Energy

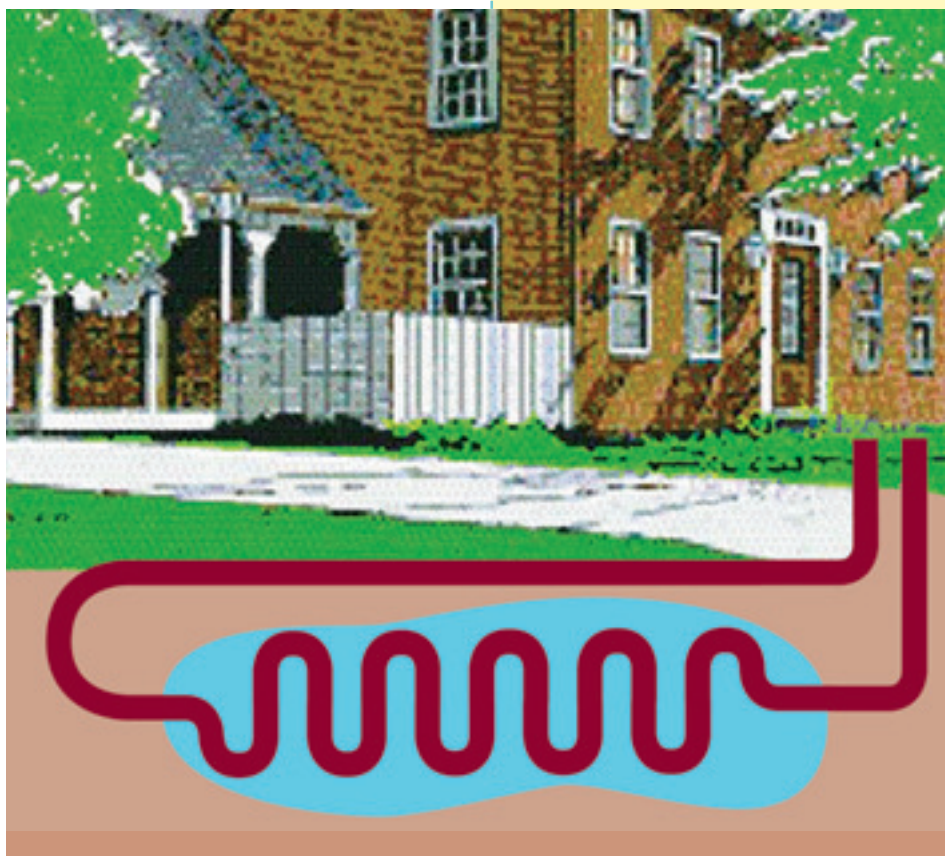
**Biomass heating and CHP**

Room stoves and central heating boilers that use wood pellets or chips are popular in mainland Europe and are now available in the UK.

Fuel comes from a variety of sources including urban tree pruning, wood coppicing and waste wood, and because carbon released from burning is taken up by new tree growth the systems are climate-neutral. The boilers use smokeless fuels that comply with the Clean Air Acts.

Storage space is required for the fuel and these systems are best suited to low density housing areas where space is available for storage and for the boilers themselves which are larger than modern gas boilers.

Costs are similar to fossil fuel systems, although grants may be available (*see page 50*). Micro CHP has the potential to provide annual savings of up to 30% on a typical domestic fuel bill.



**Ground source heating and cooling system**

Source: Energy Saving Trust

**Ground source heating and cooling**

Popular in Europe and in self-build projects in the UK, these systems extract stored heat from the ground. Although space is needed around a property to bury pipes, the low-density housing found in Woking is ideal for their use.

When installed the systems are invisible and have minimal maintenance requirements.

### + MORE INFO ON INSTALLERS AND FUEL SUPPLIERS

**Installers:** [www.clear-skies.org/households/results](http://www.clear-skies.org/households/results)  
**Product list:** [www.clear-skies.org/installers/RecognisedProducts](http://www.clear-skies.org/installers/RecognisedProducts)  
**Fuel:** [www.greenenergy.org.uk/logpile](http://www.greenenergy.org.uk/logpile)  
[www.britishbiogen.co.uk/aboutbb/members/members.htm](http://www.britishbiogen.co.uk/aboutbb/members/members.htm)  
[www.bioregional.com](http://www.bioregional.com)

Biomass Combined Heat and Fuel (CHP) produces electricity as well as heat from wood. These systems are not yet available for individual homes but are being developed for community heating systems and are suitable for larger premises such as schools, hospitals, offices and shops.

**Find out more from The Combined Heat and Power Association:** call 020 7828 4077 or visit [www.chpa.co.uk/direct.htm](http://www.chpa.co.uk/direct.htm)

### + MORE INFO

+ **Heat Pump Association**  
 Tel: 0118 940 3416  
 Web: [www.feta.co.uk](http://www.feta.co.uk)

+ **Energy Saving Trust**  
 Web: [www.est.co.uk/bestpractice](http://www.est.co.uk/bestpractice)

## Sustainable energy in Woking

Woking Borough Council has an outstanding record in energy management, and notably in commissioning and implementing projects concerned with sustainable energy. These achievements have been recognised by the UK Government, which in 2005 conferred 'Beacon' status on the Borough. Support will be provided to enable the Borough's Energy Services team to pass on its own good practice and achievements to other Local Authorities.

Several high profile projects have been successfully commissioned in Woking, including a fuel cell powered combined heat and power (CHP) plant in Woking Park which generates electricity by re-combining hydrogen and oxygen into water. A natural gas fired CHP plant in the middle of the Borough serves the Holiday Inn Hotel, the Civic Offices and a number of other town centre buildings. It is anticipated that the unit will also serve the planned new County Hall and Woking Museum and Gallery buildings.

At sites in the Borough large roof-mounted photo-voltaic panels generate power directly from sunlight in a CHP system, to serve sheltered residential accommodation and community buildings. These installations will eventually be inter-connected, making distribution more efficient and independent from the National Grid.

These systems and energy conservation have resulted in over 17% reduction of CO<sub>2</sub> equivalent emissions from 1990 levels (the base year). Ultimately, alongside the environment, Woking Borough residents will benefit from the savings and from the programme of further innovations planned for the future.

The Borough is investigating innovative and economical mini-CHP schemes as part of a plan to make sustainable energy more readily-available to domestic users.

## The future for renewable energy

In addition to these systems new sources of renewable energy are due to be introduced – in particular trials are underway of CHP gas boilers.

Other ideas include micro-hydro electric power from water, geothermal energy from the ground and fuel cells. The Woking Park plant is the largest in the UK at present but this is seen as the fuel of the future by many and smaller applications are possible. There are fuel cell buses now running in London.

## Wind turbines

Wind power is one of the most cost-effective ways of generating renewable energy. Much attention has focused on large wind turbines and wind farms – but smaller wind turbines have now been developed for urban areas and for installation on individual buildings. They are quiet, and can be mounted on or next to buildings, and over the next few years they are likely to become more generally available at low costs.

Small wind turbines have power outputs that range from 600w upwards and cost £2,500-£5,000 per Kwe. Many urban areas are suitable and average wind speeds of 5m per second will generate enough electricity for a home from a 600w turbine. Larger turbines can sell surplus energy to the grid.

Check with the Local Planning Authority whether planning permission is needed before proceeding with installation of a wind turbine



### British Wind Energy Association

Web: [www.bwea.com/members/CompanyDirectory.asp](http://www.bwea.com/members/CompanyDirectory.asp)



### Dti Clear Skies grant scheme

Web: [www.clear-skies.org.uk](http://www.clear-skies.org.uk)

## Retailers



### Windsave turbine

(cost: £1000 plus 5% VAT and installation),  
27 Woodside Place, Glasgow G3 7QL

Tel: 0141 353 6841

Web: [www.windsave.com](http://www.windsave.com)



### Swift turbine from

### Renewable Devices Energy Solutions Ltd,

SAC Bush Estate, Edinburgh EH26 0PH

Tel: 0131 535 3301

Web: [www.renewabledevices.com](http://www.renewabledevices.com)