

Green energy

From biofuels to solar panels, there's now a wide range of ways in which we can reduce our domestic output of greenhouse gases. **Simon Birch** examines the merits of small-scale energy options.

WITH GLOBAL WARMING the number one environmental issue facing the planet, the good news is that homeowners can now play their part in the fight against climate change. Thanks to the development of small-scale renewable energy systems, we can drastically reduce the amount of greenhouse gases our homes are responsible for – and we can do this by generating a significant proportion of our own heat and power, something that's known as 'microgeneration'.

It's a little known but hugely important fact that a whopping 25 per cent of the UK's climate-changing carbon dioxide pollution derives from the heat and power that we use around our homes.

With the backing of the Government,

microgeneration is now beginning to take off, thanks in part to high-profile supporters such as Tory leader David Cameron, who has recently installed a micro wind-turbine and solar panels in his London home.

One of the other factors that is powering microgeneration's increasing popularity is the recent and dramatic rise in the cost of gas and electricity, which is now making microgeneration technologies increasingly economic, especially if you throw in the financial sweetener of a Government grant.

We've put five of the most widely used microgeneration technologies to the test to help you choose. Remember that this is a rapidly expanding industry, so do contact several companies for a quote.



Solar panels

Sundog ☎ 01768 482282;
www.sundog-energy.co.uk

» **Cost** £12,300. Grant £5,940. Total £6,360.

» **Spec** 12 roof-mounted solar panels, inverter fitted in the loft, meter in the kitchen.

» **Energy output** 1.5kW system generates 1,500kWh to 1,700kWh and up to 50 per cent of a typical household's electricity needs.

» **Energy source** The sun. Works throughout the year but performs best on long, sunny days. Slight increase in performance the further south you live.

» **Installation** Straightforward. Average installation takes two to three days.

» **Maintenance** Maintenance free.

One for the long-term as costs are expected to fall dramatically in the future. **5/10**

THE TEST

THE EXPERT



Freelance environmental journalist Simon Birch has been writing on a range of environmental issues for 15 years

and regularly contributes to *BBC Wildlife* and *The Guardian*, as well as having his own column in *Ethical Consumer* magazine.

HOW WE TESTED THEM

» **ENERGY OUTPUT** How much energy does each system produce?

How much does the system contribute to a household's heating and power needs?

» **ENERGY SOURCE** What is the energy source? How reliable is it? Does where you live in the UK make a difference?

» **INSTALLATION** What is involved in fitting the kit? How much does it intrude into your home?

» **MAINTENANCE** Does the system need regular maintenance?

JARGON BUSTER

POWER

To compare the power ratings for each of the different systems, standard energy terminology has been used:

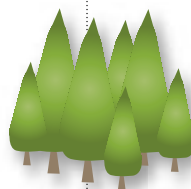
Kilowatt (kW) A kW simply defines the rate at which a system is able to give out heat or power. For example, a household electric heater is usually rated at 1.5kW.

Kilowatt hour (kWh) A kWh is the standard unit for measuring energy. For example, the average three-bed semi is generally thought to use about 4,600 kWh a year for its lighting and other electrical appliances.

GRANTS

Government grants are available for microgeneration systems via the Low Carbon Buildings Programme. Grants are awarded on a strictly first-come-first-served basis and a key condition is that you've already installed a basic level of energy efficiency around your house, such as loft insulation or low energy lightbulbs. Contact the Low Carbon Buildings Programme ☎ 0800 9157722; www.lowcarbonbuildings.org.uk.

More information and advice is also available from the Centre for Sustainable Energy ☎ 0117 929 9950; www.cse.org.uk



Biofuel wood boiler

Wood Energy ☎ 01398 351349;
www.woodenergyltd.co.uk

» **Cost** £10,250. Grant £1,500. Total £8,750.

» **Spec** High-tech fridge freezer-sized boiler attached to wood pellet hopper and ash box.

» **Energy output** 15kW system produces 25,000kWh per annum. Provides a household's hot water and heating.

» **Energy source** Boiler runs on pellets of compressed sawdust from saw-mill industry. Systems are 95 per cent carbon-neutral.

» **Installation** Usually takes one to two days.

» **Maintenance** Annual inspection. Produces 20kg of ash – a high-grade garden fertiliser.

Highly efficient technology and almost 100 per cent carbon-neutrality make this an excellent system. **8/10**



Micro wind-turbines

Renewable Devices ☎ 0131 535 3301;
www.renewabledevices.com

- » **Cost** £5,000. Grant £1,500. Total £3,500.
 - » **Spec** A 2.12m diameter turbine on a 5m pole is fitted onto gable end or roof. Small box of electrical equipment is installed in loft/attic.
 - » **Energy output** 1.5kW system produces 2,000kWh to 3,000kWh per year.
 - » **Energy source** A survey is required to check that the location has suitable wind resources. Generally, the further west you live in the UK the better the wind resource.
 - » **Installation** Straightforward – can be fitted in half a day. Planning permission is needed.
 - » **Maintenance** Inspection every two years.
- Turbines have great potential once the predicted price drop occurs.**

8/10



Solar hot water

Solartwin ☎ 0845 1300 137;
www.solartwin.com

- » **Cost** £3,150. Grant £400. Total £2,750.
- » **Spec** A collecting panel 2.4m by 1.2m is fitted onto the roof with a smaller solar power panel to drive the system's pump.
- » **Energy output** Peak output is 1.6kW, which can deliver 1,000kWh per year. Can provide up to 70 per cent of a household's hot water over a year.
- » **Energy source** The sun's energy heats water in the collecting panel, which is then piped into the hot water tank. The system works anywhere in the UK, even

in winter, though performs best on long, summer days. Slight increase in peak performance the further south you live.

- » **Installation** The collecting panel bolts directly onto the roof and can be fitted in a day. It works best on south-facing roofs. Unless the property is in a national park or conservation area, no planning permission is needed. Looks like a Velux window.
- » **Maintenance** Only requires an annual inspection.

Solar hot water systems are currently the cheapest microgeneration technology and, together with their straightforward installation, they make the perfect entry-level system.

9/10



Heat pumps

Eco Heat Pumps ☎ 0114 296 2227;
www.ecoheatpumps.co.uk

- » **Cost** £9,000. Grant £1,200. Total £7,800.
- » **Spec** 200m of pipe buried 1m in the garden. Fridge freezer-sized pump and hot water tank.
- » **Energy output** A 5kW system generates 15,000kWh to 20,000kWh per year.
- » **Energy source** Ground temperature at depth of 1m is 12°C. Ground source heat pumps transfer this energy into buildings.
- » **Installation** Highly disruptive. Back garden needs to be dug up to lay pipework. Best left to new builds or renovations.
- » **Maintenance** No maintenance needed. Systems can run for 20 to 25 years.

Scores top marks for new build houses but otherwise inappropriate.

4/10

CHOOSING THE WINNER...

WHILE INCREASING NUMBERS of people want to start producing their own heat and power at home, many are left bewildered by the choice of different systems on offer. All five microgeneration systems that I reviewed use vastly different technologies and all work brilliantly, so how did I choose the winner?

To begin with, some systems are only going to work for a very select number of homeowners. While I think that ground source heat is a vastly underrated form of energy, there is no getting away from the massive disturbance caused by its installation. As a result, this system only works for those small numbers of people who are planning to build a new house or considering major renovations to their existing property.

I'd have loved to have chosen solar power as the overall winner because it utilises the sun's energy – the ultimate renewable resource. But a price tag of £6,000 will deter most people. I also really rated the biofuel wood pellet burner because of the fact that, unlike solar power, which just provides electricity, the biofuel boiler caters for all your heating and hot water needs. This is worth thinking about if you

consider that 70 per cent of all domestic energy bills go on the cost of providing heating and hot water.

The other reason I liked the biofuel boiler is that it makes good use of a waste product, namely sawdust. Again, though, at nearly £9,000 it's eye-wateringly expensive.

This just leaves micro wind and solar hot water, both of which are priced at the budget end of the microgeneration market, which I thought was good. I especially liked micro wind

Solar hot water is not just the cheapest option...installation is also faff-free.

for its high visibility and the very public statement it carries of positive action against global warming.

But I've chosen solar hot water as the overall winner, not just because it's the cheapest system, but because of its faff-free installation – unlike micro wind, you don't need a survey – and the fact that it can make a real difference to both your energy bills and the battle against climate change.