

From Times Online

May 16, 2010

The answer's not blowing in the wind

Fitting a turbine to your roof might seem a tempting green investment, but could it turn out to be a white elephant? We explore the alternatives

Gordon Miller

For someone keen not only to do their bit for the environment, but to be seen to be doing their bit, there is nothing better than erecting a wind turbine in the garden. The neighbours may be wary, but those spinning blades are clear proof of your green credentials.

When it comes to generating electricity, however, they may not be all they're cracked up to be, as the broadcaster Jonathan Dimbleby has found. The presenter of BBC Radio 4's *Any Questions?*, who courted controversy last year by erecting a 50ft turbine in the grounds of his Devon home, revealed last week that its blades were turning rather more slowly than he had hoped.

"It's meant to produce about 11,000kW a year, but it's not delivering anything like that," he complained. "I'm afraid we need a very bad summer for it to deliver its potential."

Dimbleby is not the only one to have been disappointed by wind power. David Cameron, keen to burnish his green credentials, made great play of his decision in 2007 to install a turbine on his west London home, but he was forced to remove it last year because he had not obtained planning permission. A spokeswoman said earlier this year that he had returned it to the architect. "The technology has moved on, so there was no point in putting it back up," she said.

What's wrong with turbines? Although highly effective when used in large numbers in offshore wind farms, they are not so well suited to domestic use.

To start with, there's the cost: installing a 2.5kW-6kW system, described by the Energy Saving Trust (EST) as typical for domestic use, costs £11,000-£19,000. Then you must find somewhere suitable to position it. For optimum performance, it is best to have the turbine high on a mast or tower, as wind speed increases with height.

You will usually need planning permission, whether mounting it on the roof or on a wall.

Maintenance also needs to be considered. Wind turbines have a life of up to 22½ years, according to the EST, but require regular maintenance, which can be as often as once a year. The cost of operation and maintenance varies according to the size and type of system, but studies suggest that you should budget 1.5%-2% per year of the original turbine cost.

"If you live in an urban location, then don't look at wind as a renewable energy solution — it just won't perform," says Rob Worthy, who runs a renewable-energy consultancy, SolaFlair (01865 424869, solaflair.co.uk). "To be effective, wind power needs 'clean air', with no obstructions. You don't get that in built-up areas."

Many of those contemplating installing turbines will have been persuaded by the system of "feed-in tariffs", introduced by the government last month to persuade people to turn their homes into mini power stations. Under the scheme, homeowners are paid a guaranteed amount for the electricity they generate, which, in the case of wind power, can be as high as 26.7p per kilowatt-hour (kWh; one unit of electricity). That's considerably more than it would cost a consumer to buy it from the grid.

Yet experts insist there are other, more cost-effective ways of generating energy in the home. Photovoltaic panels are probably the most attractive. These are powered by daylight — not just direct sunlight — and work even in Britain's overcast climate, although their performance necessarily falls off in winter, with its shorter



Turbines can work well in exposed locations such as this one, but are less effective in towns

days.

The tariff paid on these is relatively high — up to 41.3p for each kWh generated. A system that delivers 2kWp (the peak output in kilowatts) should cost about £10,000 to install in a typical home and earn about £900 a year.

Those fortunate enough to have a river or stream running through their garden could consider a micro-hydro system. The installation costs are likely to be higher — as much as £25,000 for a typical system, according to the EST — but so, too, is the likely payback: an annual yield of 5%-8% is realistic. For such schemes to work, however, there must be a strong enough head of water.

An alternative is to produce your own heat, rather than generate your own electricity. Solar panels for heating water can produce up to 60% of the annual hot-water requirement of a typical home. For example, Worthy says the system he has installed at his home in Oxfordshire provides him with hot water from April to October. A typical system costs £4,000-£5,000 and saves £400-£500 a year on your electricity bill, he says.

Many green-minded engineers consider ground-source heat pumps to be the way forward. Using a series of pipes buried a few inches under your garden, these generate heat by taking advantage of the difference between the temperature of the air and that of the ground. This heat is used to warm water that is fed into a more conventional boiler. With a typical cost of £7,000-£13,000, such systems are relatively expensive, and require a decent-sized outdoor area.

Air-source heat pumps, which, as their name suggests, make use of heat in the atmosphere, are a cheaper alternative. They typically cost £5,000-£9,000 for a system suitable for a detached house, including installation, according to the EST.

Solar thermal, ground- and air-source heat pumps are not covered by feed-in tariffs at present, but this is due to change next April, when a Renewable Heat Incentive will reward homeowners who generate heat from renewable energy sources, rather than fossil fuel. It has not yet been announced how much will be paid per unit.

These and other incentives may, of course, change under the new government. Both the Conservatives and the Liberal Democrats are keen to encourage greater use of renewable energy, but they could go about achieving this goal in a different way from Labour.

Dimbleby, meanwhile, seems undaunted by his disappointing experience with turbines. He has said he may install a ground-source heat pump at his Devon home instead.

Green energy: the facts

Wind: A 2.5kW-6kW turbine system — which may need planning permission — costs £11,000-£19,000, including installation, and could provide enough electricity for your home. A typical household could save up to £380 a year on bills, but maintenance can be costly.

Photovoltaic panels: These cost £8,000-£14,000, but savings can be substantial — about £200 off your bills each year. A 2kWp system should provide 40% of a household's yearly electricity needs. They require little maintenance, but need to be kept clean, and you must clear overhanging branches.

Hydro: Installing a 5kW hydro scheme suitable for an average home costs £20,000-£25,000. Such systems are usually reliable.

Source: Energy Saving Trust

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