

Wind Turbine FAQs

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Can I have my own wind turbine?

Small wind turbines are ideal for householders, communities and small businesses to use for on-site energy generation. There are a range of different types of small wind turbine models and due to their flexibility small wind turbines can be installed in most locations. Your individual site specifics (such as location, wind speed and local landscape) will eventually determine the best turbine type and size for your case.

How do I find out if my site is windy enough?

Rain, Wind and Sun can provide a test, which will tell you the average wind speed in your area. The actual wind speed at your site will be influenced by the local topography (detailed description of the surface features of a region) and any nearby obstructions such as trees or other buildings. A site with an average wind speed of 5 metres per second is generally sufficient enough to make installing a small wind turbine worthwhile.

How does a wind turbine make electricity?

Most wind turbines have three blades which face into the wind; the wind turns the blades round, this spins the shaft, which connects to a generator. A generator produces electrical energy from mechanical energy.

What size turbine will I need?

The size of your house, how many inhabitants and annual consumption will determine the size of machine required. An average house uses an estimated 4,700 kilowatt hours (kWh) of electricity per year. If the wind turbine is connected to your side of the utility meter, you will use all the wind power available to meet your demand. When the wind generated power is greater than your demand, the excess is exported to your local network. You are permitted to sell that excess to a supplier under terms arranged with that supplier. An export meter measurement will be needed, but this need not be at short intervals (e.g. half hourly) it could be annual.

How tall are small wind turbines?

Tower height varies according to wind turbine models, but they generally range from 6 to 12 metres for stand-alone machines, which are often used to provide a power source where grid power is not available. In general, the higher the tower, the higher the average wind speed that the turbine will experience and the smoother the wind. The rotor diameter of small wind turbines ranges from 1.0 to 11 metres depending on the type of model.

How much space do I need for a turbine?

Ideally, stand-alone turbines should be sited as far away as possible from buildings or trees, which may block the wind and cause turbulence. As a guide, the wind turbine should be about twice the height of obstructions in the immediate front of it (for at least the prevailing wind direction). In general, the turbine should be above the height of nearby obstructions that are within a distance of 10 to 20 metres of the tower heights. Rooftop-mounted turbines can generally be mounted on either the side or on top of buildings and should be installed so that the vibrations from it will not be transmitted to the building. Local turbulent airflow around the building, which causes reduction in generated output and could damage the turbine, must be considered as well. In general, the less turbulent and varying the wind, the better the wind power generation.

Do I need planning permission?

Small wind energy installations may require planning permission and you should always consult the planning officers, and confirm in writing subsequently. It is clearly good manners to discuss your plans and aspirations with neighbours. Relevant factors include environmental impact, access to the site, noise and visual effects. Overall, national planning policies support the development of small-scale wind energy.

What are wind turbines made of?

Wind turbine towers are generally made of steel. The blades are made of glass-fibre reinforced polyester or wood-epoxy (a tough resistant thermosetting synthetic resin). The finish in most models is matt, to reduce reflected light.

Are wind turbines noisy?

The majority of modern small wind turbines have been designed to be very quiet, for instance by having direct drive systems to avoid gear box noise and to increase efficiency. In general, the wind itself makes more noise than a wind turbine. It is most unlikely that any noise from small wind turbines will be heard at more than 50 m.

Do wind turbines affect the TV reception?

In general, turbines with small diameters are unlikely to have effects on television and radio reception. If this does occur it is likely to be highly localised and technically easy to overcome. It is also unlikely that small rooftop wind turbines will effect either mobile phone reception or fixed radio or microwave communication links.

Will small wind turbines have a ‘flicker’ from the turbine blades?

Potentially, sunlight passing through moving blades can cause a flickering effect in ‘line of sight’ directions. The possibility of the shadow from the wind turbine causing flicker should be considered at the site selection stage. It is normally possible to avoid this problem. Reflections from the blades are unlikely, especially as the coatings used on modern turbines have been selected to minimise reflection.

What about lightning strikes?

Lightning strikes do occur and can cause damage to any structure raised from the ground. However, lightning protection is a well known practice and can be applied to wind turbines. On some turbine models, full protection of electrical circuits is installed at manufacture. Obviously, as with other elevated structures protection against lightning is advisable, if the turbine is installed in an area where lightning strikes are frequent. Insuring the turbine against lightning damage may be a wise precaution.

Can I use my turbine for heating?

Yes you can, small wind turbines can be used for direct heating, e.g. water heating as well as for battery charging and they are also ideal in remote off-grid locations. However, the energy required to heat a building is usually significantly more than the energy used in electricity, so a much larger turbine would be needed to supply building heat.

Can I connect my turbine to the grid?

Small wind turbines can be connected to the local electricity network. When a wind turbine connection to the mains supply is made, it has to be approved by your local electricity distribution utility company. This company will require the connection to be of a satisfactory technical standard. Therefore the cost of incorporating power import and export meter measurement and approved electrical protection equipment may be a significant proportion of the total cost. The company may also limit the electrical capacity of the wind turbine that may be connected to a particular distribution line, depending on the loading of the electrical distribution system in the vicinity.

What happens when the wind stops blowing?

When the wind stops blowing, electricity continues to be provided by other forms of generation in an isolated system e.g. batteries, generator and by the grid in a grid-connected system. UK electricity generation is now overwhelmingly from large power stations, and so the system needs to cope when one of these large plants goes out of action. Consequently, it is possible to have at least 10% to 20% of the country’s electrical demand met by intermittent energy sources such as wind energy, without having to make any significant changes to the way the system operates.

Isn’t it cheaper to save electricity?

Since most of us are not fully efficient in using energy, it is almost certainly cheaper to reduce electricity consumption than to buy it or generate it yourself. Nevertheless, electricity generation is necessary. Therefore, to combat climate change and to have security, it is essential both to increase the proportion of renewable energy and also to have energy efficiency.

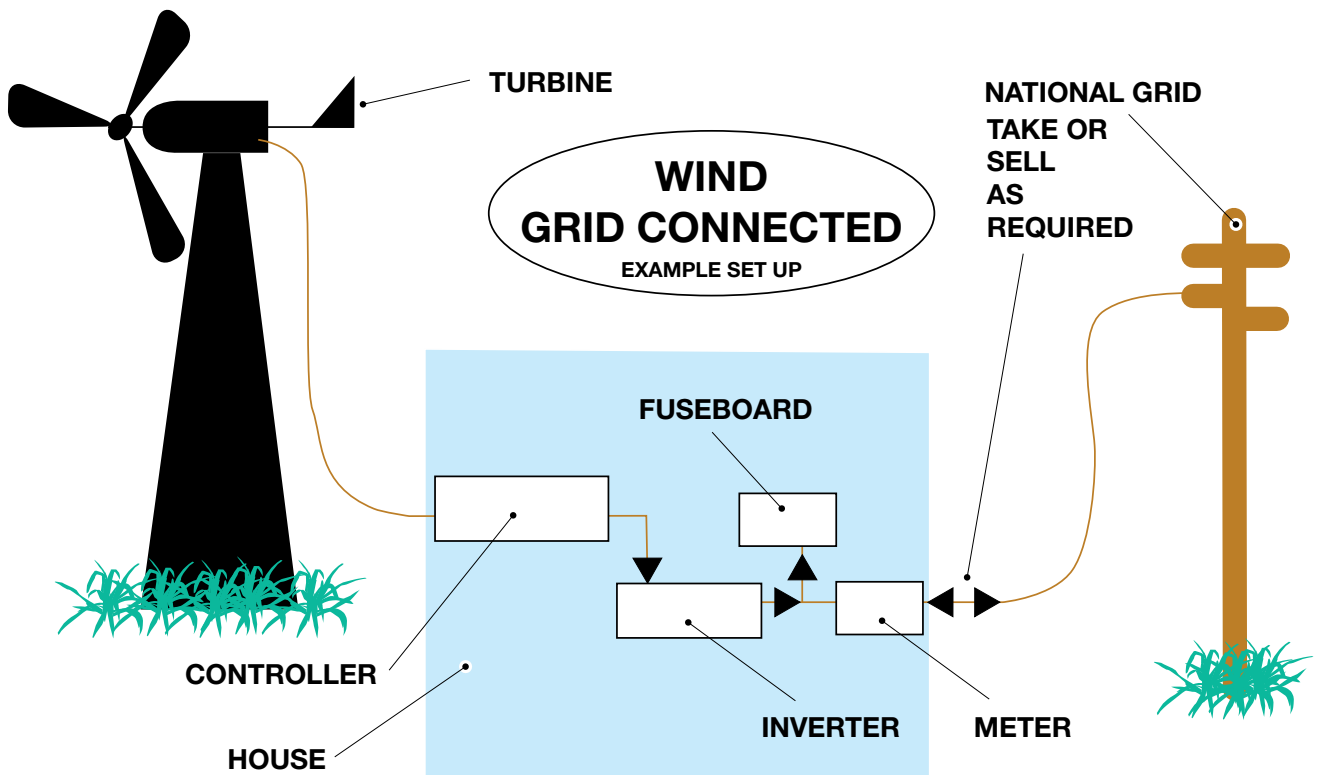
How do I look after my wind turbine?

The maintenance required for small wind turbines is likely to be minimal. An annual check is all that is likely to be required and can be arranged by Rain, Wind and Sun.

Can the turbine be re-sited?

Yes, provided the new site is suitable. Costs will be incurred to dismantle the turbine, transport it to the new site and re-install it. An estimate of these costs can only be prepared after a survey of the old and new sites.

How It Works...



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