



# "The 9 Most Frequently Asked Questions and Answers You Need To Know To Select The Right Windcharger To Solve Your Problem"

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## **Can I run my house?**

Some small wind turbines (defined as rated at <50kW) can deliver enough power to run your house or small industrial unit. The larger the turbine blade diameter the greater the power generated. These turbines are referred to as "grid connected."

Micro wind turbines, typically around or less than 100W @ 11m/s (metres per second wind speed) are used most effectively for charging batteries in "stand-alone" systems, ie not connected to the grid. However an inverter can be used to convert the battery power, DC electricity, to mains voltage to run low energy household appliances.

## **Are they noisy?**

It depends on the individual product design. Factors that affect noise are aerofoil blade profiles and the speed range within which the turbine operates. Turbines with fewer blades have a higher tip speed ratio, ie run faster, and this contributes to aerodynamic noise, that's the swishing sound that can sometimes be heard. Small turbines rarely have complicated and noisy gearboxes.

## **Can I fix a turbine to my roof?**

Much depends on the structure of the building and the size and weight of the turbine. Providing a strong fixing is made, very small turbines eg less than 1m in diameter, may present acceptable structural stresses to a building especially if they have a built in shut down mode in high winds. Larger turbines are best installed on a free-standing purpose designed tower, many are available in the market place. However fixing directly to homes in urban areas should be approached with caution for the above reason and for reasons of available "clean" wind in urban areas which will affect the efficacy of your turbine. See "How high does it have to be installed?"

## **Are there any government grants available?**

Grants are not available for small battery charging applications. There are limited grants for larger turbines connected to the grid and rated at or above 500W @ 11m/s, this is typically a turbine of around 2.2m in diameter.

## **How many kilowatts will it produce?**

Of course this depends on the diameter of the turbine and the generator's efficiency but the great thing about wind power is that it is subject to the cube law. This means that by doubling the turbine diameter the power that can be theoretically produced is 8 times.

## **How high does it have to be installed?**

The location and height of the turbine is a major factor in the overall performance of the system. The smooth flow of wind over land and water is often interrupted by a multitude of obstructions causing wind shear and turbulence.

**Wind shear** describes the interference between the fast moving upper air and the slow moving air close to the ground and the resulting decrease in average wind speed as one gets closer to the ground.

**Turbulence** is caused by the wind passing over obstructions such as moored boats, trees, and buildings. Both wind shear and turbulence diminish with height and can be overcome simply by putting the turbine sufficiently high above them. Wind speed decreases and turbulence increases where obstructions exist. Consider also that downwind obstructions can be as detrimental to performance as upwind obstructions. It is therefore essential that the wind generator should be located in an area as free as possible from disturbed wind flow and this will be according to the particular application, eg on a boat a convenient height is around 2.5m whereas on land a minimum height of 6m is preferable.



## **How do I install it and wire it up myself?**

Micro wind turbines for battery charging are generally designed to be simple enough to assemble and self-install ensuring that costs are kept to a minimum.

On land a tower is installed, it can be self supporting or a guyed tower, in either case a hinged base is advisable for long term servicing. In the case of Marlec a range of mounting kits specific to using the turbines on land or mounted on board a yacht are available.

DC electrical systems are low in voltage and simple to work with, only positive and negative cables but general safety precautions should still be observed. Electrical connection is usually made to the battery via a voltage regulator and in small systems these are normally designed to be self installed. In the case of turbines connected to the grid a qualified electrician must be employed.

## **How do small wind generators survive in stormy winds?**

This varies according to the model and the manufacturer, the quality of the materials used and the design of the product. Different models might be designed for specific environments or applications, eg marine model wind generators for use on boats or furling types of designs for land based applications.

## **Do I need planning permission?**

Very small turbines installed on boats and in temporary applications such as caravans do not require planning permission. At your home installations may require permission from your local planning office but overall national planning policy supports the installation of small wind turbines. In the UK permitted development rights for turbines less than 2.2m in diameter and installed at less than 11m height is expected in the near future.