



## **Renewable Energy: The facts.**

### **Wind Power**

Wind power has been exploited for thousands of years for grinding and pumping, but its use for generating electricity grew during the 20<sup>th</sup> century. The design of modern electricity-generating wind turbines has evolved a great deal from the early corn-grinding and water-pumping 'windmills'.

#### **Scale**

You have probably all seen the big white wind turbines on the hills, often in clusters of between five and thirty. These are the 'big boys', often generating between 0.5 and 3 Megawatts (a megawatt is 1000 kilowatts) each. A one-megawatt turbine running for an hour at maximum speed would power 1000 one-bar electric fires!

At the opposite end of the scale are very small wind turbines, of the kind that you may have seen on narrowboats or caravans. These are used to help keep batteries charged, and may range from 50 watts to a few hundred watts.

In between these two extremes are 'small to medium' turbines of 2 – 10 kilowatts which can make a significant contribution to the power requirements of domestic buildings and small businesses. These can either be used to charge batteries where the property is not connected to the National grid, or (with the permission of the electricity company) the turbine can be connected into the National Grid. If you choose to do this, you need to ensure that you have, or change to, a supplier who will pay you for any surplus electricity you 'export' to the Grid.

#### **Aren't they noisy?**

Noise levels will clearly vary according to design, wind-speed and so on, but our own experience with a 2.5 kW turbine show that noise is negligible-hardly greater than the noise of the wind in the trees, and never a cause of complaint for local residents.

#### **How big are they?**

How long is a piece of string?! It depends on the output. A small turbine of 50 watts may have a diameter of perhaps 900mm and sit on a mast just tall enough to keep the turbine clear of heads and fingers, while our 2.5 kW turbine has a blade diameter of 2.5 metres and sits on an 11m mast. One of the 'big boys', the 1.5 Megawatt turbine at the Eco-Tech centre in Swaffham, Norfolk, has a mast 67 metres high and a blade diameter of 66 metres, and turbines of 2 – 3 Megawatts are beginning to be more common.

### **What really affects the output?**

As suggested above, size has a lot to do with it, but so, of course, has wind speed. Both of these factors are governed by very useful 'rules'. For wind speed it's the 'cube rule'. This means that if you double the wind speed, the output of the turbine increases by 8 times. As far as size is concerned, output goes up by the square of the blade diameter, so if you double the blade diameter, you increase the output by 4 times.

### **Will I require planning permission?**

Yes. Always consult your local planning department for details.

### **How much will it cost me?**

Again, it depends on size. A very small turbine of around 50-70 watts may cost between £300 and £500, while a grid-connected 6 kilowatt turbine may cost over £24,000 plus V.A.T. installed.

### **Can I get a grant?**

Not for a domestic installation since February 2010 (unless your Local Authority has any incentive scheme – check with your council's home energy department).

### **But you can get a Feed-in Tariff!**

#### **What is a feed-in tariff?**

A feed-in tariff is an incentive scheme designed to encourage people to adopt renewable energy sources. The idea is that a fixed rate will be paid for a fixed term for energy generated on a small scale, even if you use the electricity yourself. Further payments will be made for energy exported to the national grid. These payments significantly reduce the payback period for domestic renewable energy sources. The scheme began on April 1st 2010. The Feed-in Tariffs for Wind-power appear below::

<b>Tariff levels for electricity financial incentives</b>					
		<b>Year 1: 1.04.10- 31.03.11</b>	<b>Year 2: 1.04.11- 31.02.12</b>	<b>Year 3: 1.04.12- 31.03.12</b>	
Wind	≤1.5kW	34.5	34.5	32.6	20
Wind	>1.5 - 15kW	26.7	26.7	25.5	20
Wind	>15 - 100kW	24.1	24.1	23.0	20
Wind	>100 - 500kW	18.8	18.8	18.8	20
Wind	>500kW - 1.5MW	9.4	9.4	9.4	20
Wind	>1.5MW - 5MW	4.5	4.5	4.5	20

**Some manufacturers of domestic-scale wind turbines are:**

**Proven Engineering:** [www.provenenergy.co.uk](http://www.provenenergy.co.uk). Tel: 01560 485 570

**Iskra Wind Turbines:** [www.iskrawind.com](http://www.iskrawind.com). Tel 0845 8380588

**Marlec Wind Turbines:** <http://www.marlec.co.uk>. Tel: 01536 201588

**Gazelle Wind Turbines:** [www.mkw.co.uk](http://www.mkw.co.uk). Tel: 0191 413 0000

**For further advice on this and other renewable energy technologies contact SYEC on 0114 2584574 or [info@syec.co.uk](mailto:info@syec.co.uk)**