

dti  
Low Carbon Buildings Programme



# Case Study for Small Scale Wind Turbine

## The Project Timescale

- May 06**—Jeffrey Booth contacts Segen interested in a small scale turbine
- Late 06**—Segen visited the Highfield Barn site and carried out a feasibility study for the turbine
- Late 06**—Segen provide the specification and quote for the wind turbine needed along with other very useful documents such as planning support information, how to buy and sell surplus power etc
- Jan 07**—Jeffrey applies for the online grant from the DTI—this is successful and means the project is supported by funding as Segen are a fully accredited installer.
- March**— Jeffrey makes a planning application to South Hams using the very detailed and successful Segen planning support pack.
- April 07**—Planning permission is granted by South Hams for the small scale wind turbine
- May 07**—Jeffrey undertakes the groundwork's (concrete base) completed to the specification provided by Segen.
- June**—Segen install the wind turbine at the Highfield Barn site. The control panel installation, erection of mast and assembly of turbine takes 2 days
- June 07**—The turbine is connected to the National Grid and commissioned and completed at the site by Segen



## System Specification

<b>Turbine type :</b>	Iskra 5kW AT5-I
<b>Tower height:</b>	12m Mast
<b>Turbine Output:</b>	5kWh
<b>Blade Dia:</b>	5.4m
<b>Authority:</b>	South Hams

## System Cost:

**Typical Cost £22,000.00 (Excluding groundwork's)**

The groundwork's and cable were undertaken by Jeffrey and in both cases the specifications supplied by Segen. (Approximate groundwork's cost £2,400.00)

### Is my site windy enough?

In general, you need an AMWS of at least 4 m/s to be able to generate a reasonable amount of energy, and ideally more than 4.5 m/s. The turbines that Segen sell work well at low wind speeds, but because the energy available in the wind is a function of the cube of its speed, there is very little energy available to be harvested at wind speeds less than 4 m/s. Enter your post code in our free windspeed checker online at [www.segen.co.uk](http://www.segen.co.uk) to see an estimate of the AMWS and estimated energy output, for a 1km square that includes your site.

### What is the best tower type and height for me?

Our standard towers are 9, 12, 13, 15 and 18m metres high. In general, the higher the tower, the higher the average wind speed that the turbine will experience, but it may not always be the case in normal UK conditions, that a taller tower will generate sufficient extra energy to justify its additional cost, unless there are local obstacles to be avoided.

### How much space do I need for a turbine?

Ideally, the turbine 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 generator should be about twice the height of obstructions in front of it (for at least the prevailing wind direction). This test should be applied for all obstructions that are within a distance from the wind turbine of 20 times the height of each obstruction. This is especially important where the obstruction is between the turbine and the prevailing wind, which is normally the South West. A building to the North East will have much less impact on overall performance.

### Can I mount my turbine on the roof of one of my buildings?

This is probably the most asked question of any, and the one to which there is the least agreement in the entire worldwide small wind industry, as to the correct answer.

**Segen does not currently supply a wind turbine that can be mounted onto a roof and does not generally recommend a small wind generator in an urban environment**, but we will be following developments within the industry with keen interest.

### Which turbine is suitable for my needs?

A medium sized average home requires between 4–6 MWh of energy per annum. A school, office, community centre or farm will almost certainly use a lot more.

The **Iskra AT5-1** 5kW turbine (installed at Giles Wilson) is capable of supplying the above at an AMWS of about 4 m/s and can supply considerably more annual energy on a windier site.

For larger applications, e.g. schools, golf clubs, farms, community centres and commercial premises the larger, more powerful, **Westwind 20** 20kW turbine may be more appropriate. Schools often like the AT-1 due to size and the educational links that come with that installation. The WestWind 20 will generate approximately 30MWh per year at a moderately windy site.

And finally, newly introduced into the UK is the brand new **Southwest Windpower Skystream 3.7**, which is an innovative 1.8kW turbine with all the electronics for the grid connection built-in to the turbine head. This helps to bring the cost down of both the system and the installation. This is an ideal turbine for smaller domestic applications, and can be sited significantly closer to neighbour's properties than any of the other turbines we offer.

### How does it connect to the National Grid?

Any power you generate will be first used by your own property, thereby saving you the maximum amount possible on your electricity bill. Any excess energy your wind turbine generates, e.g. on windy days or at night, is "spilled" to the National Grid and your electricity supplier pays you for it. In order to charge your electricity supplier for any energy that you export to the grid, you need to have a new bi-directional electricity meter installed which will work both when you buy (import) and sell (export) electricity. To claim your sale of Renewable Obligation Certificates (ROCs) you will also need a ROC meter, which keeps track of all the energy your turbine generates.

### Do I need planning permission?

It is essential in England and Wales to get planning permission to install a small wind turbine, but Segen will help you with this process and provide you with all the supporting information you need. Often just calling your local planning authority to explain you are looking at such a project can be worthwhile to get some initial feedback. Segen has an excellent and very successful supporting document to help with your planning application which we will help you complete to assist with your planning application.

### What grants are available?

You will normally be entitled to **£2,500** from the LCBP for the **Iskra AT5-1** and **Westwind 20**. The application process is relatively simple and quick and Segen will provide you with all the information you need to complete the application form.