CLASP. Climate Change Local Area Support Programme

Low carbon case study no. 3: Small wind at Spring Farm Business Centre

Introduction to Spring Farm Business Centre

Spring Farm Business Centre is a small office development in a rural location just north of Crewe.

It is owned and operated by Peter Darlington and contains individual office rental units and storage buildings housed in converted agricultural buildings, which is now a diversified rural enterprise run alongside the family beef and sheep farm.

Until the mid-nineties Spring Farm was run as a commercial dairy farm by the Darlington family, but in order to protect the long term security of the business, the family needed to diversify, and in 1997 took the decision to sell the dairy herd and convert the redundant farm buildings into office space. The offices are leased to several local businesses and one office unit is occupied by CMS UK Ltd, a rural, business and renewable energy consultancy, also run by Peter Darlington.

Wind turbines at the Spring Farm Business Centre

Peter Darlington and CMS UK have practiced what they preach by installing two Gaia 133 wind turbines at Spring Farm Business Centre. Each of these wind turbines is rated at 11kW peak capacity and mounted on an 18 metre mono pole tower. The turbines were installed and fully commissioned in September 2010.

At 11kW capacity these are classed as small turbines.

Specification

The specifications of the two Gaia 133 wind turbines are as follows:

Configuration: two blades, horizontal axis, down wind.

Rated Power: 11kw @ 11 m/s

Cut-in: 3.5 m/s & Cut-out: 25 m/s+

Rotor Diameter: 13m

Swept Area: 133 square metres

Tower: Free Standing Monopole 18 metres

Design Life: 20 years (subject to service and maintenance)

Warranty: 2 years (5 year extended available)

Wind speed

Pre-installation checks into standard data available from various websites indicated that the wind speed at Spring Farm would be some 5.4 m/s. Since coming into operation the actual wind speed at the two turbines is in line with the anticipated figure.

Planning consent

Obtaining planning approval for a small to medium size wind turbine is often not always straightforward and applicants are often required to engage with various organisations such as Natural England, MoD, OfCom etc to ensure all planning considerations are addressed.

Planning permission for the turbines was granted on 14 May 2010. The Decision Notice (application ref: 10/0286N) can be viewed on the Cheshire East Council website: www.cheshireeast.gov.uk

Grid connection

The two turbines are connected to the National Grid at the farm buildings via a three phase electric supply. Most turbines over 10kW will require a three phase grid connection. Up-grades from single phase to three phase and connections to the National Grid have to be negotiated with the local District Network Operator (DNO).

Power generation

Power generation from the two Gaia turbines at Spring Farm commenced in late September 2010 and in the period up to 17th May 2011 the two turbines have generated a total of just over 30,000 kWh of electric. This equates to an average of some 2,000 kWh per month from each turbine. This includes some down time during the initial commissioning stage which reduced the monthly average slightly, but it is expected that based on the average wind speed of 5 m/s the monthly average energy generation will be around 2,250 kWh per month or 27000 kWh per year.

As a general guide in other locations with higher average wind speeds a Gaia turbine would produce:

Approx. 37,000 kWh Annual Energy Generation at 6 m/s wind speed; or

Approx. 41,000 kWh Annual Energy Generation at 7 m/s wind speed.

Investment

To supply and install a Gaia 133 11kw wind turbine complete with underground cable connection to the meter/grid connection is likely to cost around £56,000 +VAT (correct at May 2011).

Income

Income from a wind turbine results from:

1. Savings on imported electric replaced by renewable energy from the turbine;
2. Sales of surplus electric into the National Grid; and
3. Income from the Feed in Tariff (FITs) introduced in April 2010 (please note, a Microgeneration Certification Scheme (MCS) approved installer and certified wind turbine need to be used for the installation to be eligible for FITs).

For information on the current FIT rates, please visit the Ofgem website:
www.ofgem.gov.uk/Sustainability/Environment/fits/Pages/fits.aspx

The Future

CMS UK has also recently obtained further planning consent in 2011 to install two additional 55kW wind turbines at the Spring Farm Business Centre. These will be the Endurance E-3120 wind turbines mounted on a 25 metre mono pole tower. The base for the first Endurance E-3120 wind turbine has been completed in April 2011 and it is planned to install the wind turbine before the end of 2011.

Further Information

As well as being a commercial project in their own right, the wind turbines are being made available for anyone interested in this type of renewable technology to visit the Spring Farm Business Centre (by appointment) to see for themselves how well they fit into the farm, the business and the local landscape, without any unacceptable impact (please note, a small charge may apply for a guided tour).

For further information please visit CMS UK website www.cmsuk-services.co.uk or contact the CMS UK Ltd planning team on Tel 01270 522645.

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