

Great Ayton – Wind Turbine



Information on this home

A wind turbine installed for domestic use and ancillary equipment can be seen.

Renewables: electricity

Wind Turbine:- Bergey Excel 10 kW
Manufacturer:- Bergey Wind Power, USA

Detailed specification:-
<http://bergey.com/products/wind-turbines/10kw-bergey-excel>

Installed:- November 2006
Installer:- Winsund (no longer trading)
Cost:- £ 26,276 total system costs in 2006
Grant: £5,000 administered by the Energy Savings Trust

Output:- 13 – 14,000 kWh per annum
Predicted output from a model:- 19 763 kWh

Replacement system:-

In 2013 an error was made during a service leading to the tail clipping the blades causing damage. The system was out of use for 6 months but the turbine head and blades were replaced under warranty, upgrading the maximum output to 12 kW.

Financial support:- Treated as a new system with Feed-in Tariff payments of 24.5 p per kWh from July 2013.

New system Output:- 18 – 19,000 kWh per annum



Issues to consider

The wind resource:- Wind data was taken from a wind database that was provided by the DTI (now available from DECC) that combined historic data and modelling, so only a rough indication. This gave an annual average wind speed of 5.6 m s^{-1} at a height of 10 m. Local sources provided validation. Prevailing wind is from south and west.

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Planning:- Neighbours were all supportive which helped the planning application. The site is near the boundary of the National Park whose planning officer liked the lattice tower rather than a solid pole construction.

Turbine model:- An important factor in selection was the expected high reliability from rugged construction of the Bergey.

Cable run:- This depends on the site and may add to the cost. The 300 m from the turbine to the inverter (pictured below right) in an outbuilding near the house is relatively long.

Grid capacity and use of output:-

It was only possible to export a maximum of 5 kW to the local electricity grid without an expensive grid upgrade. Surplus electricity is therefore diverted to heat hot water for the central heating and domestic hot water system of the house. One water heater is switched on when generation exceeds 5 kW and a second when generation exceeds 8 kW. The hot water heating system is supplied by Thermalec and controlled by an EMMA system www.thermalec.co.uk/ & www.coolpowerproducts.com both installed by Hadrian Electrical from Hexham. <http://hadriane.co.uk/>



The anemometer mounted on the tower provides wind speed data. Rainfall data is also collected. The small PV panel powers data collection. A data logger is positioned at the base of the tower and information is transmitted by wireless to the house and web.

Personal insights

The installation was the first Bergey wind turbine in the UK to be grid connected. In general it has been a positive experience.

Thoughts on the original installation were contributed to a blog at www.renew-reuse-recycle.com/showarticle.pl?id=682;n=707

An update after the replacement of the turbine is at www.renew-reuse-recycle.com/showarticle.pl?ft=0;id=2571;n=707

Bergey turbines are now supplied in the UK by Flogas Renewables of Blaby, Leicestershire www.flogasrenewables.co.uk/



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