

Case Study – Small Scale Wind

Lammerlaw Farm 11kW Wind Turbine

Client: Robert Campbell



Green Cat Renewables

Green Cat Renewables managed and installed this Gaia 133-11kW wind turbine project, including turbine site selection, turbine foundations, delivery to site, turbine assembly and commissioning.

The Gaia wind turbine is a twin-bladed, downwind rotor of Danish design with a 13m blade diameter, and an 18 meter tower height. Both lattice and tubular style towers are available; the lattice tower was used on this occasion as its open structure reduces its visibility on a hilltop site such as this. The turbine uses an induction generator and as such requires a 3-phase electricity supply; a single phase version is currently in development.

The location of the turbine was carefully selected to ensure good exposure to the available wind resource whilst minimising the turbine's visibility from the nearby village. The turbine was located near a hill top that offered good wind exposure in most directions, but particularly in that of the prevailing south-westerly wind. There were some trees at the site and care was taken to ensure that the turbine was at a higher elevation and sufficiently distant to minimise their effect on the wind seen by the turbine.



A concrete pad-style foundation was first constructed (5m x 5m x 1.15m) complete with steel reinforcing mesh. A dedicated turbine earthing arrangement for lightning protection was also installed. During the concrete foundation's 2 week cure time, the power cable back to the property was buried in a cable trench.

As with most small scale wind turbines, the Gaia turbine is fully assembled on the ground before being raised into position; this approach not only speeds up the turbine assembly process, but is safer as it reduces the amount of work performed at height.

Key Data

Turbine type: Gaia 133 (11kW)

Turbine configuration: 2-bladed, downwind rotor

Rotor diameter/swept area: 13m/133m²

Tower Height: 18m

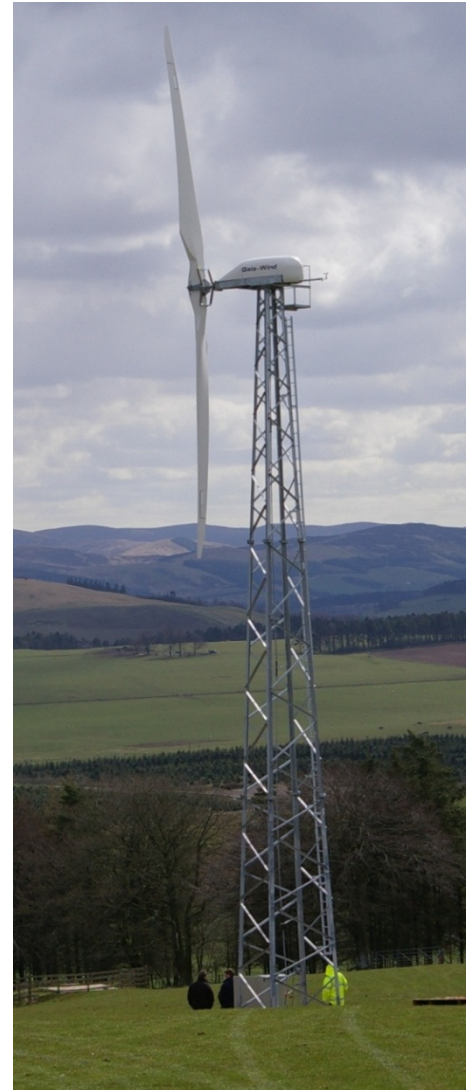
Date Work Commenced (foundations): 25/03/10

Date of First Generation: 20/4/10

Annual Electricity production: ~40,000kWh

Once assembled, the Gaia turbine was then lifted into position by crane; an access road along the field boundary was constructed to allow the crane to get up to the site, along with a small crane hard standing area. Once raised into position, the generating head was connected to the control gear at the base of the tower. After the commissioning tests were completed and the turbine made operational, the site's good wind exposure was demonstrated by delivering full power within an hour of commissioning.

A kWh meter was installed at the property to record the total electricity generated from the turbine and claim the Feed in Tariff allowance of £0.267/kWh. Electricity from the turbine was fed directly into the client's domestic supply, so that the client could use the generated electricity at the property (net worth of £0.13 kWh), with surplus electricity exported to the grid at the export tariff of £0.03/kWh.



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