



Marshall Farm Wind Turbines



*Marshall Farm
Blackwood,
Lesmahagow,
Lanark,
ML11 9PW
Farmer – Andrew Stewart*

The project consists of a single Enercon E-82 (2.3MW) and two Enercon E48 (800kw) with a total capacity of 3.9MW at a cost of £6.2 million.

Background

Marshall Farm is a 700 acre livestock farm with approximately 400 Holstein Friesian dairy cows. The farm grows around 150 acres of spring barley, while grass is grown on the remaining acreage for cattle grazing and silage production. Andrew Stewart became aware of the wind turbine development opportunity when he was approached by a wind developer but was not keen to lease the land to a developer due to the poor rates being offered. He decided to undertake the project himself and has secured planning and grid connection and plans to install 3 wind turbines on the farm.

Financials

The E-82 turbine received a Community and Renewable Energy Loan Scheme (CARES) funding of £114,000 from South Lanarkshire Council for support in its early stages, while the two E-48s were fully funded by the farm. The capital cost of an Enercon E-82 turbine fully installed with all costs and fees included for the turbine is

£2.45 million, once wider development costs such as grid connection and access are taken into account the total cost is £3.4 million. The comparable cost of an E-48 is £800,000 for the turbine with a total project cost of £1.4 million per turbine. As such the total capital cost for the entire project is currently estimated at £6.2 million. Funding for the project is planned to be made up by a mixture of bank borrowing and outside investment to make up any borrowing shortfall.

FIT payments and export tariffs could amount to approximately £1.25 million annually for all three turbines. Taking into account annual maintenance and running costs which are estimated to amount to approximately £170,000 as well as compound interest, this results in a payback for the scheme of approximately 10 years. In order to maximise subsidy payments there is the potential for the turbines to be derated; the E-82 to 1.5MW and the E-48 models to 500kW.

A proportion of profits amounting to £10,000 per MW annually will go to Lesmahagow Community Council which are intended to benefit various community projects.

CARES is designed to support small-scale projects before they reach planning, because this stage is considered too high risk for commercial loans. The scheme is open to community organisations, rural businesses and joint ventures between the two.

Wind Speeds

Rather than undertake anemometry which could have taken up to a year or more to complete, Andrew Stewart decided to purchase 15 months' worth of wind speed data from the developers of a closely neighbouring wind turbine project for £20,000. This data was then extrapolated so that it corresponded to the proposed turbine heights and this demonstrated that the average wind speeds at the site varied between 6.52m/s and 7.6m/s at the relevant hub heights. This data was then modelled to calculate project returns and payback periods.

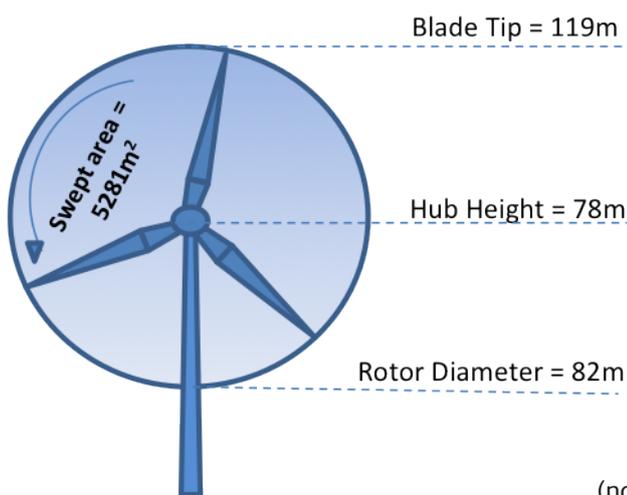
Grid

An electricity grid connection for the site has been agreed with the District Network Operator Scottish Power and a deposit of £50,000 has been paid in order to secure this connection offer. The proposed date for the distribution connection to be made is currently summer 2014, although this may need to be pushed back depending on when construction work can start on site.

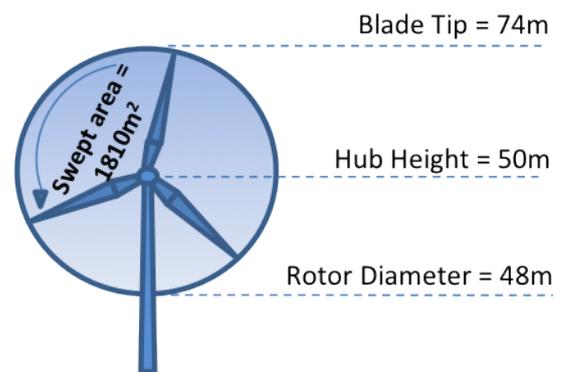
Planning

Planning permission has been gained for one Enercon E-82 turbine and two Enercon E-48 turbines to the dimensions as set out below. Although the E-82 only has a blade tip which is 38% higher than the E-48, its electricity output capacity is almost 3 times greater.

E-82 (2.3MW)



E-48 (800kw)



(not to scale)

Swept Area:

The relationship between wind speed and energy output is not linear; as wind speed increases the power output increases by a cube factor and therefore if wind speed doubles you get eight times the amount of electricity generated.

Representation in support of the planning application was made by a number of local bodies and individuals. These included Lesmahagow Community Council who stated that they felt that the payments to help local projects and the fact that the development was taking place on a long established farm business fitted well with the ethos of the Community Council.

Construction of the wind turbines is planned to start on site in summer/autumn 2014, but the exact date is dependent on funding arrangements.



This project is so far 4 years in the making and will make a huge difference to the farm business
Andrew Stewart, February 2014

