SHOCK

SUSTAINABLE HOCKERTON

The story so far

Sustainable Hockerton

The Parish of Hockerton

Hockerton is a small parish close to the market town of Southwell in Nottinghamshire. The parish includes a single village with a scattering of surrounding farms. 55 houses are clustered along the busy A617 together with a 12th century church, a pub, a restaurant, and some small industrial units.

In 2006 a group of villagers started a series of meetings to look at ways of reducing Hockerton's carbon footprint. Here we look back at our progress to 2010, the lessons we have learnt, with thanks to the many people that have helped along the way.

Green goals

Sustainable Hockerton, or SHOCK, was set up in 2006. A series of 14 meetings followed, over 2 years, attended by more than a quarter of the village's residents. The meetings were facilitated by local resident Simon Tilley, from Hockerton Housing Project, a local sustainable community. Using the participatory techniques that Simon had learnt during his time with VSO, the residents identified the following aims and objectives:

The aim of the Sustainable Hockerton group is to make Hockerton a more sustainable village and reduce the amount of carbon released into the atmosphere. This would include meeting its own energy needs from renewable sources.

- Reduce energy demand
- Generate electricity from renewable sources
- Heat homes from renewable sources
- Reduce impact from travel
- Reduce the amount of waste produced
- Increase the amount of self-sufficiency in water and water treatment
- Raise the awareness of climate change issues through education

The group felt a focus for our work was needed and that we needed to secure revenue to support ongoing activity. We therefore decided to erect, within the parish boundary, a wind turbine of sufficient size to produce electricity equivalent to the consumption of electricity in the parish. This electricity would be sold to the grid and profits would be invested in the local community, in ways which would help to achieve the original aims of the group.

Involve the community

The process attempted to involve the whole community. Flyers were distributed to each house in the village to publicise meetings. Some people could not make it to meetings, or simply did not want to get involved, but we knew that we needed everyone's views before proceeding. With this in mind, a survey was undertaken in February 2007 to understand residents' views on community action.

The questionnaire results were as follows: -

- 54 leaflets distributed, 35 were returned.
- 31 were in favour of some form of community action on reducing our carbon footprint with 4 against.
- 28 were in favour of a community turbine with 4 against, 2 undecided and 1 who required more information.
- 20 were prepared to invest in the turbine, 6 were not, 1 was undecided and 4 required more information.

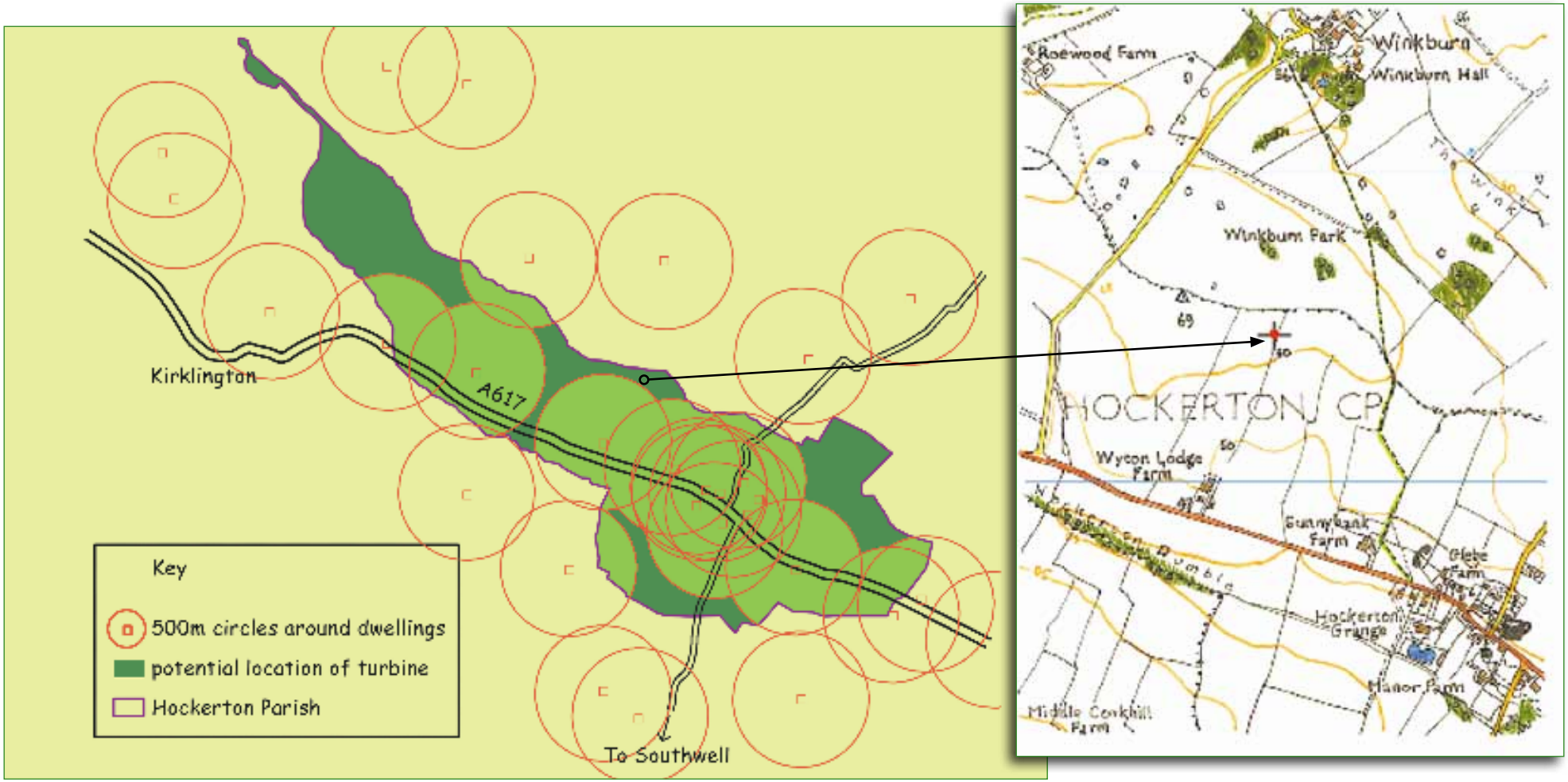
Village meetings continued through the process and a web site, www.sustainablehockerton.org, was set up by local volunteer Abhishek Nigam. An email account was also set up and staffed by Simon Tilley and the Hockerton Housing Project.

Location, location, location

Objections raised in the village survey were mainly on the grounds of visual intrusion, either on the landscape or from the flicker of the turning blades. To address these concerns we added 100m to the Government's guidance distance of 400m between properties and larger wind turbines. This resulted in a map of the parish which showed us which areas met with this condition and which had the height and open aspect to the South West needed for the turbine (see map on next page).

After making enquiries, four local farmers expressed interest. We looked at potential sites using the published wind speed estimates (NOABL database) and estimated possible production using the Canadian RETScreen International software. The chosen site is illustrated on the map below and is on land owned by Simon and Moira Christy of Grange Farm. Our solicitors, Browne and Jacobsen drew up the lease with the landowner, with the lease payable as a proportion of revenue.

Wind Turbine Location - Grid reference SK 709 574



Planning for planning

Whilst we had now identified a location, had broad support, and a viable financial proposition, the planning process was a significant challenge. Simon Tilley prepared an excellent case for a Vestas V29 turbine, with assistance from EMRA, covering:

- Power generation
- Noise generation
- Shadow flicker
- Civil aviation and Ministry of Defence requirements
- Electromagnetic disturbance
- Disturbance to television signals
- Landscape impact
- Net environmental gain
- Impact on wildlife
- Local employment

Geeta Lakshmi, Chair of Hockerton Parish Meeting, spoke at the Planning Committee hearing and Full Planning Permission was agreed on 26th June 2008.

Ready to do business

The Industrial and Provident Society, Sustainable Hockerton Limited, was created with the help of Cooperatives UK, local resident Brian Smith of Browne Jacobsen, and Malcolm of Wrigleys Solicitors. Nottingham County Council and SEEM (via Business Link) provided small grants to help with legal and accountancy costs in setting up the Society. EMRA provided funds for HHP to undertake a feasibility study.

Three founder members were chosen to set up the Industrial Provident Society and these three have acted as the membership. A Board of Directors has been nominated by the founder members of the Society and these are Bill Bolton, Peter Cooke, Liz Lainé, Patrick Lynn and Simon Tilley. We have met frequently to further the aims of the society.
As an IPS, the organisation is owned by and democratically managed by its Members who are protected by limited liability status. Its constitution is in the Rules approved by and registered with the Financial Services Authority.

Key aspects of Sustainable Hockerton Limited are:

- It is primarily run by its Directors for the benefit of the community be generating renewable energy from a wind turbine, and the Directors aim to provide Members with a small return on investments
- It has a single class of shares with a nominal value of £1 each
- Shares are transferable
- One member, one vote – however many shares the member holds
- No member may hold more than the maximum permitted by law – currently £20,000
- The Board is elected by the Members
- Only Members are eligible to serve on the Board

We chose this model as it reflected SHOCK's aims: to work for the benefit of the community. It felt that we were the first to try to set up this type of organisation, despite the good work of Energy4All and other co-operatives, and we support calls for model Rules for such organisations that also support applications for the Enterprise Investment Scheme (EIS). The EIS offers tax relief to members, worth 20% of the amount invested, but it took over six months to get agreement from HMRC to proceed with our Rules due to changes in HMRC personnel and uncertainties about the applicability of the EIS to Industrial and Provident Societies.

It was at this point that it was recognized by the Directors that they could not expect Simon Tilley to continue to manage the project on a voluntary basis. Sustainable Hockerton Limited agreed to pay Simon and Hockerton Housing Project for management of the share offer, the installation of the turbine, and the initial operation of the turbine. This was formalized in a service level agreement, and Sustainable Hockerton Limited is grateful for this agreement being largely payable from revenue or, as we like to say, 'no wind, no fee'.

Size matters

Having got planning permission and started the process of setting up our formal structure, we now had to find the right-sized turbine. The size used for the planning application was largely based on the planning regulations of the time, as a turbine with a diameter of over 29m would require a formal Environmental Impact Assessment. This scale will also cover the electricity consumption by the parish, as it was estimated that:

- Hockerton's domestic consumption is 275 MWh per year.
- Turbine production would be 330 MWh per year.
- Carbon dioxide equivalent saving of 176 tonnes of CO2 per year.

From 2010, communities will also want to take into account the payments from the Feed-in Tariff scheme, which vary according to the size of the turbine.

After much searching, Simon Tilley located an unwanted Vestas V29 turbine at the INEOS Chlorvinyl site at Newton Aycliffe in County Durham. INEOS had imported the turbine but were unable to install it following their on site risk assessment. Finding ourselves in a competitive situation, it was necessary to borrow money from a group of potential investors and make a formal offer on the turbine. This first group of investors took a considerable risk, but the speed with which the deposit of £22,000 was raised gave the Directors an indication of the support for the scheme.

Share offer

Having identified and secured a Vestas V29 thanks to the generosity of our initial investors, the Directors prepared a share offer for the full cost of the installation, estimated to be £225,450. Costs were estimated as shown in the table below:

Item	Cost
Vestas V29 Turbine	£70,000
Foundations	£14,200
Delivery and erection of turbine	£35,400
Connection to grid, including transformer and G59 panel	£72,000
Project management	£5,250
Share offer costs	£2,600
Bond	£4,000
Contingency	£10,000
Other	£12,000
Total	£225,450.00

Sustainable Hockerton Limited applied for grants towards the cost of buying and installing a wind turbine but were unsuccessful, generally due to grant funders' preference for domestic micro generation. This is why we support the introduction of feed-in tariffs which reward electricity generation rather than the ability to find and successfully complete grant application forms.

The Directors were assisted in preparing the share offer by Hockerton Housing Project and Wrigleys Solicitors. This share offer set out the environmental aims of the project together with the offer to shareholders. The financial offer for Members, who would need to invest between £250 and £20,000, was:

- Interest payments of between 5% and 8% on every share held
- Investors to be repaid in full after 15 to 20 years
- Surplus, after running costs, to support sustainable living within the parish of Hockerton

The share offer was publicized using a range of local and national networks:

- Flyer to Hockerton residents and businesses
- Poster in the local pub
- Local newspapers
- Local radio
- Hockerton Housing Project's newsletter
- Online forums and networks

We reissued the share offer twice to reflect progress and changes to the Rules required for the EIS application. One village meeting was held to boost interest at one key point: we had raised sufficient funds to purchase and transport the turbine and we had a fairly steady stream of applications; but we had to make a decision as to whether to purchase and complete the erection of the turbine in early Autumn 2009 after the harvest was completed but before the weather turned and the days got too short. There is a limited window of opportunity to install wind turbines on farm land with heavy clay soil.

Attendees and others showed their support, and we also made contingency plans for a bridging loan or overdraft from Venturesome, a social investment fund. We were then able to commence the ground works and make plans for the transport and erection of the turbine.

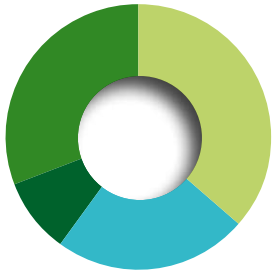
By the time we commenced energy generation in early 2010, the share offer target had been reached without the need for the Directors to recourse to a bridging loan from Venturesome. We were particularly pleased by the level of local support:

Number of Investors

Hockerton Village/Parish	27
NG25 not Hockerton (Southwell area)	11
Nottinghamshire not NG25	8
Other UK	29

Total Investment

Hockerton Village/Parish	£81,500
NG25 not Hockerton (Southwell area)	£53,000
Nottinghamshire not NG25	£20,250
Other UK	£68,500



These are interim figures because the project was not complete at the time of going to print

The nuts and bolts

In late April 2009, we visited the INEOS site, met Richard Curtis of Verdant Engineering Ltd, who had agreed to act as consultant to our enterprise, and were given a warm welcome by Andy Heyes and Eldred Dixon. We left the site with the weather vane and anemometer from the turbine, having agreed that the tower base and the transformer would be collected next, prior to the tower, rotor and gearbox. Leaving the turbine at the site in Newton Aycliffe until our site was ready was very useful and much appreciated.

A further trip to INEOS was undertaken in July in order to clean the turbine and to wrap the transformer ready for transport. The turbine was inspected for us at the INEOS site by Simon Bryars of Garrad Hassan & Partners Ltd and he determined that any mechanical damage was within the turbine's design parameters.

Clockwise from left: First site of Turbine. Meeting at INEOS. Cleaning the Turbine. Inside the base of the tower.

A firm foundation

We started on the ground works in August once the turbine had been inspected and signed off and there was a clear funding stream for completion of the project, either through shares, or Venturesome's social investment fund. The ground was firm and hard, as had previously been assessed by Analytical Geotechnics Ltd, and the excavation of the base and the reinforcement of the farm track with crushed concrete was carried out by Squires of Southwell. This needed to be firm enough to support the weight of the turbine's transporter and the cranes used for its erection. All other work including building the plant room, creating the reinforced platform, embedding the tower base, and burying the conduit for the grid connection were the work of Tina, Mick and Nick of NSM Hockerton.

We were very fortunate with the weather during this period as it was fine and dry but those carrying out the work did complain that the site was unreasonably windy! The second week in August saw the arrival on site of the tower base. The collection of the base from INEOS, along with the well wrapped transformer (690/450V), was organised by Squires of Southwell. The transformer was stored in a barn until required whilst the base was taken up to the site for installation. The base was carefully placed in the centre of our foundation trench, on the pre-laid first layer of steel reinforcement. Further levelling and reinforcement was undertaken by Tina, Nick and Mick of NSM, according to the very precise details supplied by Vestas. The installation of the base ring was then secured with 6 lorry loads of concrete from Newark Concrete.

The work involved in track laying, trench excavation and in building the plant room took several weeks. The plant room is required to house the transformer (690/450V), G59 panel and meters necessary to complete the connection to the grid and monitor our output. We hope to plant the roof with sedum in the Spring.

Laying the 550 metres of conduit.

1.Lowering the tower base into the foundation trench.
2.Ready for the concrete.
3.Pouring the concrete.
4.Building the plantroom.
5.EON install the pole mounted transformer (450/11000V).

Transporting the turbine

The turbine was insured with Zurich and we engaged Colletts Transport Ltd to transport it. No suppliers in the UK were able to commission the turbine and instead we used Dutch firm Bettink Ltd to erect and commission it. Two further technicians were required by Bettink and we engaged Sid and Joe of Alternative Energy Contracting Ltd, who have continued to work with us to maintain the turbine.

The turbine was collected from Newton Aycliffe by Colletts on Tuesday 20th October 2009 and after being held in Collets depot overnight, was delivered to the site on Wednesday 21st. The access to the track from the busy A617 was far too narrow to accommodate the Lorry and 31.5 metre tower and the entrance had already been temporarily widened. The morning was quite traumatic for those who gathered to watch, and Andrew and his team from Collets did a remarkable job navigating the tower into the still narrow entrance. The turbine was taken up to the site and off-loaded alongside the specially prepared crushed concrete platform.

With so much valuable equipment on site, a 24 hour watch was maintained by Sustainable Hockerton Directors and Hockerton Housing Project members in the week prior to the turbine's installation.

Collection of the turbine from INEOS.

Collets arrive.

Two cranes needed for the tower.

Electric shock?

The whole turbine requires earthing to ensure that people or equipment are not harmed by electrical faults or lightning strikes. This work was carried out by Kevin of KH Electrics of Southwell and his colleagues. This involved driving four copper rods into the ground and connecting all to the base and tower. The required maximum resistance was 10 Ohms and as can be seen, we are well within this limit.

A pole mounted 11000V transforner was required and this was installed by E.ON. Sustainable Hockerton Limited, the landowner and the planning authority all preferred the cabling to be underground despite the considerable extra cost. NSM dug the trench, installed the conduit and E.ON completed the remainder of the work.

Raising the turbine

On the 29th of October 2009, Bettink arrived together with the two cranes from Mammoet which were required to lift the turbine. Quite a group of villagers and other investors turned up to watch and the sight was fantastic.

The weather was dry and bright, with little wind, perfect for the erection of the turbine, and the engineers finished the job as dusk fell. A celebratory dinner was held that night in the local pub, the Spread Eagle, and most of the investors at this point felt that the job was complete.

The next few weeks were very frustrating for the team. It was necessary to pass a witness test with Central Networks, the Midlands' electricity distribution network operator, but there were a number of bugs in the connections. Three Central Networks' tests were taken before the turbine was accepted as safe to connect to the grid. The problems were very minor, a relay here, new contacts there and one or two faulty meters, but each had to be diagnosed and fixed. We are grateful to Bettink and Alternative Energy Contracting Ltd for their support during this time. Eventually Richard Curtis and the regional chief engineer from Central Networks agreed that all was well and we could safely export to the grid on Tuesday 26th January 2010.


MAMMOET
MAMMOET

Business as usual?

Writing in March 2010 more than a month has passed and we continue to export to the grid. Our chosen company to buy the energy is Good Energy and we have begun to receive our first payments. We have also applied for the new Feed-in Tariffs, and are awaiting accreditation from OFGEM, a process which was started on 6th November 2009. This decision will be instrumental in determining the scale of Sustainable Hockerton's ambition in its next steps.

Next steps

At this point, it seems important to return to the original objectives of Sustainable Hockerton:

- Reduce energy demand
- Generate electricity from renewable sources
- Heat homes from renewable sources
- Reduce impact from travel
- Reduce the amount of waste produced
- Increase the amount of self-sufficiency in water and water treatment
- Raise the awareness of climate change issues through education.

The next phase of our project must involve the implementation of these initial objectives, and we hope that our wind turbine will not only provide finance but also inspiration for local residents and businesses. Finally, we have been fortunate in having the backing of the Hockerton Housing Project and Simon Tilley in particular. It is essential that a small group develops to provide mutual support and the exchanging of ideas, and many local residents have shown their moral and financial support at key points. This has made it clear to us that it is essential to have someone with the energy, skill and drive to push through such a project. We have been lucky to have Simon fulfilling this role of 'champion' and I have thoroughly enjoyed my role as his sidekick, he graciously says co-pilot.

Peter Cooke March 2010

Thanks to

Particular thanks go to our committed investors and Simon Tilley, Project Manager, but also to…

A & V Squires of Southwell, for reinforcing the farm track and excavating the foundations, www.avsquires.co.uk

Abhishek Nigam of Hockerton, for the design of www.sustainablehockerton.org

Alternative Energy Contracting Ltd, for assisting Bettink and now us in the maintenance of the turbine, www.alternativeenergycontracting.co.uk

Analytical Geotechnics Ltd, for testing the ground could support the turbine, 01949 877061

Bettink Ltd, for installing the turbine, www.bettink.nl

Brian Smith, Browne Jacobsen, for legal services, www.brownejacobson.com

Co-operative Bank, for banking services, www. co-operativebank.co.uk

Cooperatives UK, for advice on setting up an Industrial and Provident society for the benefit of the community, www.cooperatives-uk.coop

East Midlands Regional Assembly, funding via HHP for a feasibility report, www.emra.gov.uk

E.ON Energy Services and Central Networks, for offer to supply remote moitoring and grid connection, www.eonenergy.com

Geeta Lakshmi, Chair of Hockerton Parish Council, for her support, particularly during the planning process

Good Energy Limited, for advice and support, www.goodenergy.co.uk

Graphic Green, for graphic design services, www.graphicgreen.co.uk

Hockerton Housing Project, for project management, administration and day-to-day operations on behalf of its Directors, www.hockertonhousingproject.org.uk

INEOS Chlorvinyl, for supplying the turbine, www.ineos.com

KH Electrics of Southwell, for earthing the turbine

John Ware of Ken Ware Engineers Ltd, for advice on metal work, www.kenware.co.uk

Malcolm Lynch, Wrigleys Solicitors, for legal services, www.wrigleys.co.uk

Mammoet, for doing the heavy lifting, www.mammoet.com

Nottinghamshire County Council, grant for legal costs to set up the society, www.nottinghamshire.gov.uk

NSM Builders of Hockerton, for a range of work on site from the foundations to the green roofed plant room, 01636 812774

R Collett & Sons (Transport) Ltd, for transporting the 31m turbine tower and rotor, www.collett.co.uk

Richard Curtis of Verdant Engineering Ltd, for his knowledge, advice and support, www.verdanteng.co.uk

Romax Technology Ltd, offer to install monitoring equipment, www.romaxtech.com

SEEM (via Business Link), grant funding for accountancy set up, www.seem.uk.net

Simon and Moira Christy, landowners and local restaurant owners

Simon Bryars of Garrad Hassan & Partners Ltd, for assuring us of the quality of the turbine prior to the purchase, www.garradhassan.com

Simon Shaw of Dunkan and Toplis, www.duntop.co.uk

The Spread Eagle, the local pub

Venturesome, for providing us with a financial safety net, http://www.cafonline.org

Whitchcraft Engineering, for steel work, Hockerton

Zurich, for insuring the turbine, www.zurich.co.uk

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