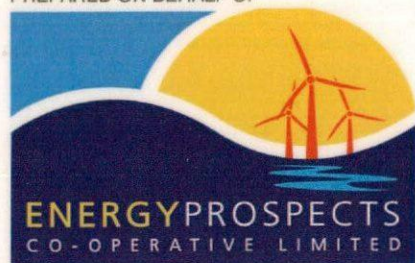




CO-OPERATIVE WIND TURBINE AT SHAFTON TWO GATES

Planning Application Documentation
and Environmental Report

PREPARED ON BEHALF OF



SEPTEMBER 2013

farmwind

Contents

5	Introduction
5	The Proposal
8	Location and Applicant
12	Co-Operative Ownership
15	Lifetime of the Proposal
15	Expected Production
17	Renewable Energy Technologies and the Drive for Wind Energy in the UK
20	Current National Renewables Policy
26	Design and Access Statement
36	The Findings of the Environmental Studies
37	Traffic and Transport
42	Geology and Soils, Hazardous Substances & Flood Risk
45	Ecology
52	Noise
58	Archaeology and Cultural Heritage
63	Landscape and Visual Effects
72	Aviation
80	Telecoms
81	Utilities
81	Television Reception
84	Socio-Economic Effects
91	Environmental Impacts Summary Table
102	References
107	CD Appendices

APPLICATION DOCUMENTATION AND ENVIRONMENTAL REPORT

CD Appendices Contents

- Appendix 1 Site Investigations (Energy Production Calculations, MAGIC search)
- Appendix 2 Project Screening Request and Response
- Appendix 3 Coal Mining Risk Assessment (Dunelm Geotechnical & Environmental Ltd)
- Appendix 4 Full Ecology Report (E3 Ecology Ltd.)
- Appendix 5 Full Noise Report (Ion Acoustics Ltd.)
- Appendix 6 Full Cultural Heritage Report (CgMs Consulting)
- Appendix 7 Full Landscape and Visual Assessment (Optimised Environments Ltd.)
- Appendix 8 Aviation Consultations
- Appendix 9 Shadow Flicker, Telecommunication and Utilities Consultations

A3 Figures Contents

- Figure 1 Site Location
- Figure 2 Site Layout Plan
- Figure 3 Aerial Site Layout Plan
- Figure 4 Core Strategy Proposals Map
- Figure 5 Typical EWT DW 54 Turbine Detail
- Figure 6 Typical EWT DW 54 Foundation Detail
- Figure 7 Typical New and Upgraded Access Track Detail
- Figure 8 Typical Hardstanding Detail

Figure 9	Typical Substation Detail
Figure 10	Typical Meteorological Mast Detail
Figure 11	Turbine Delivery Route
Figure 12	Site Entrance
Figure 13	Extended Phase 1 Habitat Survey Map
Figure 14	Scheduled Monuments
Figure 15	Grade I and II* Listed Buildings
Figure 16	Grade II Listed Buildings
Figure 17	Conservation Areas
Figure 18	Landscape Assessment Site Location (study area)
Figure 19	Landscape Elements
Figure 20	Existing Landscape Character
Figure 21	Landscape Designations
Figure 22	Visual Receptors - Site Locality
Figure 23	Visual Receptors and Viewpoint Locations
Figure 24	Surface Model Zone of Theoretical Visibility (ZTV) 25km Radius
Figure 25	Surface Model Zone of Theoretical Visibility (ZTV)
Figure 26	Terrain Model Zone of Theoretical Visibility (ZTV)
Figure 27	Surface Model Zone of Theoretical Visibility (ZTV) - Roads/ Long Distance Routes
Figure 28	Cumulative Wind Energy Developments

Figure 29 Cumulative ZTV: Royd Moor

Figure 30 Predicted Landscape Character Effects

Visualisations; Viewpoints 1 - 8 :

Viewpoint 1: Ferrymoor Way

Viewpoint 2: Grimethorpe, Taylor Crescent

Viewpoint 3: Brierley, Cliffe Close / Barnsley Boundary Walk

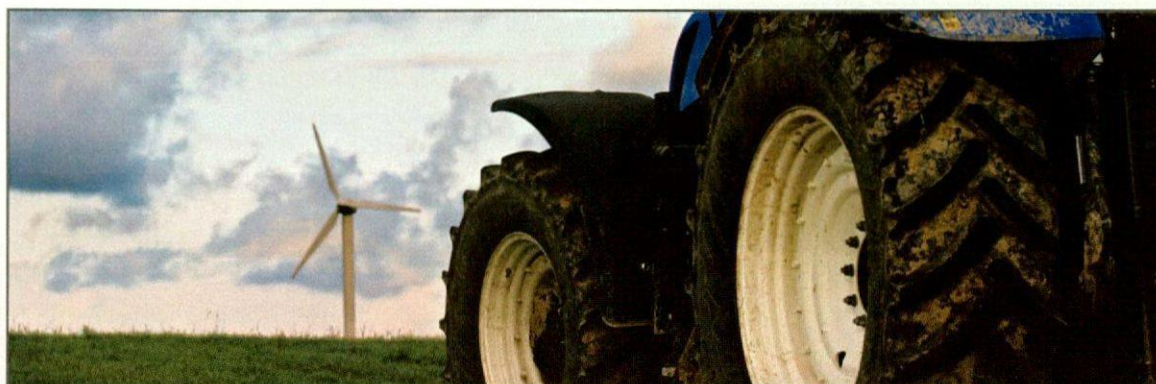
Viewpoint 4: Shafton Two Gates, Pontefract Road

Viewpoint 5: Cudworth, Tippet Lane Public Footpath

Viewpoint 6: Monk Bretton, Burton Road / Public Footpath

Viewpoint 7: A6195, Engine Lane

Viewpoint 8: A6195, Ferrymoor Flash



INTRODUCTION

- 1.1 This document forms the associated environmental information for the proposed co-operatively-owned wind turbine on land at the former Shafton Two Gates (hereafter referred to simply as Shafton) coal works, near to Grimethorpe and within the administrative area of Barnsley Council. The site location is shown in **Figure 1**.
- 1.2 Included in this document are:
- an introduction and description of the proposal;
 - a Design and Access Statement;
 - a description of the screening of the project;
 - a summary of the findings of the assessments;
 - a summary impacts table;
 - appendices on CD (providing all assessments and figures in full); and
 - figures: key figures and visualisations of the proposal provided in A3 format.
- 1.3 A separate Planning Statement is also provided with this application.

The Proposal

- 1.4 The proposed development consists of:
- a temporary wind monitoring mast (50m);
 - a single, co-operatively owned wind turbine (with a maximum vertical height to the tip of the blade of 77m when the blade is in its upmost position);
 - a small substation unit adjacent to the turbine to contain the transformer, switchgear and metering equipment;
 - an associated hardstanding (for use by the crane during erection); and
 - an access track.
- 1.5 The arrangement of these elements is shown on the layout map at **Figure 2** and on an aerial image at **Figure 3**.

- 1.6 The wind turbine market is fast moving, with models being regularly updated. There are presently a number of models available within the 77m tip height envelope. As such, the applicant is confident that a turbine can be procured which fits this tip height. The exact make and model that will be procured cannot be specified at this time and the final model will be chosen from the open market. The requirement for this flexibility is recognised by National Policy Statement for Renewable Energy Infrastructure (EN-3) (DECC, 2011b), and as referred to in the National Planning Policy Framework (DCLG, 2012a) at Paragraph 3. EN-3 states at Paragraph 2.7.19 - 2.7.20:

'As set out in Section 4.2 of EN-1, at the time of application, wind farm operators may not know precisely which turbine will be procured for the site until some time after any consent has been granted. If turbine details, or any other relevant information, are not available, such as the precise location of the source of concrete and crushed stone to be used for the construction, then the applicant should assess the effects that the project could have (as set out in EN-1 paragraph 4.2.8) to ensure that the project as it may be constructed has been properly assessed. In this way, some flexibility should be provided in the consent.'

In the case of onshore wind farms, it is likely that this flexibility will be needed in relation to the dimensions of the turbines, including tip height, hub height and rotor diameter. This may extend to other details of the turbine design, including the necessary size of any external cabins that may be required. In some specific circumstances, applicants may not know the precise layout of wind turbines, such as where the site is covered by forestry at the time of the application.'

- 1.7 The assessments for this environmental documentation have been based upon a candidate turbine, the 500kW EWT DW (Directwind) 54 wind turbine, which has a hub height of 50m, a rotor diameter of 54m and thus a maximum height to tip of 77m. Alternative 500kW turbines that are currently available within this 77m tip height are listed in **Table 1**. Any alternative turbine will be required to match or better the environmental performance of the candidate EWT turbine which forms the basis for the assessments.

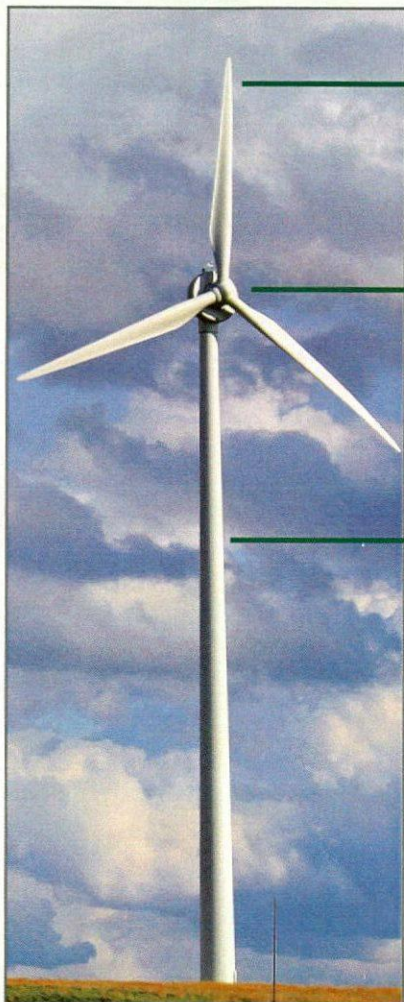
Table 1 - Alternative 500kW Turbines within 77m Tip Height Envelope

TURBINE	HUB HEIGHT (m)	ROTOR DIAMETER (m)	TIP HEIGHT (m)
Enercon E44 - 500	55	44	77
Enercon E53 - 500	50	53	76.5
Enercon E48 - 500	50	48	74
Gamesa G58 - 500	44	58	73

- 1.8 A typical EWT DW 54 wind turbine is shown in **Plate 1**, together with descriptions of the main elements of the turbine. A drawing of typical turbine detail is provided as **Figure 5** in the A3 Figures section.
- 1.9 A hardstanding area will be required for the construction cranes. A typical hardstanding for an EWT DW 54 is 20m wide and 35m long. A drawing of a typical hardstanding is shown in **Figure 8**, in the A3 figures section.

Co-operative Wind Turbine at Shafton Two Gates

Plate 1 - A Typical EWT DW 54 Wind Turbine (image courtesy of EWT International)



THE BLADES:

The blades are a single piece made of epoxy resin. They angle into and out of the wind in response to variations in wind speed to optimise energy capture.

THE NACELLE:

The nacelle contains the generator, cooling systems, part of the electrical control system and the yaw drive. The yaw drive rotates the whole nacelle to ensure the rotor is always pointing directly into the wind.

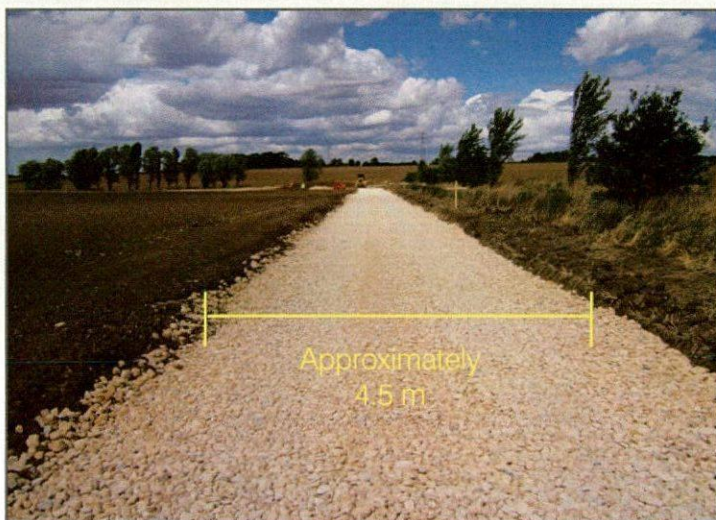
THE TOWER:

The tower is constructed from sections of welded rolled steel and typically has a 3.6m diameter base and a 1.9m diameter at the top. The height from the bottom of the tower to the middle of the rotor is called the hub height. For the chosen EWT DW 54 this is 50m.

Electrical and telecommunication cables pass down the centre of the tower to an external transformer adjacent to the base of the turbine.

The turbine will have a steel reinforced concrete foundation of either piled, slab or hybrid design. Typical slab foundations are 13m wide and 2.4m deep, a drawing is shown in **Figure 5**.

Plate 2 - A Typical Access Track (note Hardstanding will also have the same appearance)



The existing site tracks will be used for access, if possible. Should tracks need upgrading or adding to, they will have an approximate width of 4.5m.

It will be required throughout the lifetime of the proposal, for access and maintenance.

A technical drawing of a typical new access track is shown in **Figure 6** of the A3 Figures booklet, at the back of this document.

- 1.10 The hardstanding and access tracks will both have a crushed stone running surface, with a stone sub-surface over a geotextile membrane. They will be semi-permeable. A typical access track for this scale of turbine is shown in **Plate 2** and **Figure 7**.
- 1.11 The transformer and switchgear equipment will typically be housed within the same external substation. This is a Glass Reinforced Plastic Unit typically 5.1m long, 3.5m wide and 2.5m tall although sizing will depend on the exact requirements of the DNO and their equipment at the time of installation. A drawing of a typical substation unit is shown in **Figure 9** in the A3 figures section. This unit combines the external transformer, substation and meter box and so is segregated for use by the Distribution Network Operator (DNO) and Developer independently.
- 1.12 Whilst there is sufficient wind resource for a viable wind turbine project, it is necessary to monitor the site specific wind conditions to inform project financiers and the wind turbine warranty. It is proposed to erect a temporary guyed 50m meteorological mast at the turbine position for a six month period. After six months, and before construction commences, the mast will be removed. A drawing of a typical mast is shown in **Figure 10**.

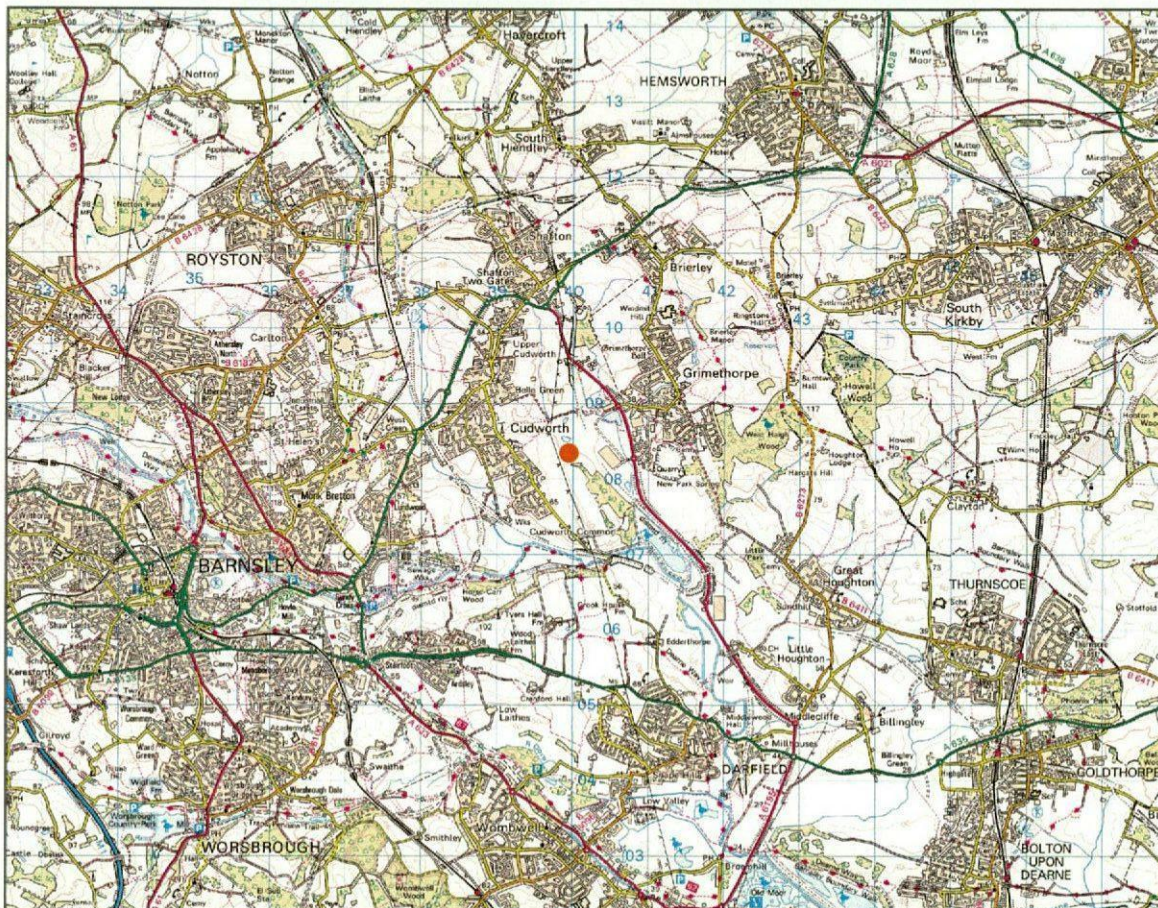
Location and Applicant

- 1.13 The proposed turbine would be located on land owned by Harworth Estates at the former Shafton Two Gates coal works, adjoining the former Grimethorpe Colliery in Barnsley District, South Yorkshire. From 1904 the north eastern part of the site was occupied by a railway embankment while the rest of the site remained unchanged until 1972. In 1972 the centre of the site was occupied by slurry ponds (infilled from approximately 1984). From 1982 the northern part of the site was occupied by open cast 'workings' and the central and southern parts of the site were occupied by refuse/slag heaps. From 1984 the central parts of the site were occupied by colliery works and the southern parts of the site were occupied by a 'spoil heap'.
- 1.14 The site was restored around 2002 from the former industrial activities and is now predominantly covered by rough grassland. There are two areas of water bodies to the north of the proposed turbine location and an area of newly planted woodland to the south. Small trees and hedgerow vegetation is present at the boundary of the site area. The site is located approximately 1.2km West of Grimethorpe and 1.3km south-east of the centre of Cudworth. The location of the site is shown in **Plate 3** and **Figure 1**, with the site layout shown in **Figure 2** of the A3 section.
- 1.15 In addition to those mentioned in **Paragraph 1.14**, the nearest settlements are Shafton Two Gates (approximately 2.2km north), Brierley (Approximately 2.8km north-east), Shafton (approximately 2.9km north), and Great Houghton (approximately 3.3km south-east). In the wider area are the settlements of Darfield to the south, Barnsley to the west, Royston to the north-west and Hemsworth to the north-east.
- 1.16 Some dispersed dwellings are located around the site, particularly on Engine Lane and Storrs Mill Lane. There are a number of dwellings surrounding the proposed site. The closest residential properties are located at Moorland Terrace, off Darfield Lane, approximately 450m to the west of the turbine at the closest point. The visual receptors are considered in the Landscape and Visual Assessment which is contained

Co-operative Wind Turbine at Shafton Two Gates

in summary from Paragraph 1.236, and also shown on Figures 22 and 23.

Plate 3 - Site Location



© Crown copyright. All rights reserved, 2013. Licence number 0100031673. Scale - 1:100 000 at A4. Site Location marked by orange dot - not scaled.

- 1.17 Adjacent to the proposed development is the former colliery site of Grimethorpe. This has now been restored and is redeveloped as industrial warehousing. Primarily the UK Headquarters of the Symphony Group Plc., manufacturer of fitted kitchen, bedroom and bathroom furniture, borders the east of the turbine site. There are further industrial units to the north-east and east of the site, these are mostly to the north of the A6195. This is the nearest main road to the site and runs in an approximate north/south direction to the east of the site.
- 1.18 To the north of the site the A6195 connects with the A628 to/from Barnsley, and passing the site approximately 1.7km to the west. Between the A628 and the site there is a line of high voltage electricity pylons running approximately north/south. This line of pylons slightly changes direction within the proposed development site and so passes by the turbine approximately 155m to the south-west.
- 1.19 Access to the site is achieved via an existing track called Ferrymoor Lane, to the north of the turbine location. The track was previously used as an access point during the

operational period of the coal works. From the A6195, the road has a tarmac surface for approximately 280m, at which point the track is gated. Existing on-site tracks past this point will require upgrading for delivery of turbine components and associated infrastructure for the project.

- 1.20 The proposed turbine is located within a field of rough grassland, with the adjacent field to the south containing young woodland. The land at and surrounding the proposed turbine location is undulating and involves some steep gradients due to the mix of natural landform and former mining spoil. The elevation at the turbine position is approximately 50m AOD and 40m AOD at the site entrance. The terrain of the restored land within the boundary of the dismantled railway is at lower elevation than the surrounding ground. Generally there is higher ground in the wider surrounding area of the site. For example, at Cudworth the elevation is between 60m and 70m AOD, and at Grimethorpe there is more variation in the elevation which is between approximately 50m to the north and 75m to the south.
- 1.21 The site is located in an urban fringe and industrialised landscape between the surrounding settlements as described from **Paragraph 1.14**. A selection of photographs to set the context of the site are shown in **Plate 4**. There are no formal Public Rights of Way crossing the site, although during site visits a number of paths were noted in use in the immediate area. The definitive map for the area identifies a footpath running approximately east/ west along Ferry Moor Lane, 500m north of the proposed turbine. In addition there is a bridleway along Tippit Lane, connecting Darfield Road at south Cudworth to Belle Green Lane at north Cudworth. The turbine is approximately 450m to the east/south-east of this route at its closest point.
- 1.22 Under the Natural England Agricultural Land Classification (provisional for England) the site is within an area of Grade 3 farmland. Whilst this class is defined as good to moderate quality farmland, in reality the land at this site is not suitable for agricultural production and substantially comprises mining spoil from the former activities on the site. The proposed development is not major development and in any case only removes a small area of land from other use (the total development footprint in place for the 25 year life of the project is approximately 0.420ha (to 3 S.F.)). The land can continue to be used up to the base of the turbine and hardstanding during the operational phase of the proposed wind turbine development. Adjacent to the proposed site there is a combination of Urban and further Grade 3 classified land, with small patches of Grade 4 land to the south and west. There is no land of lower classification within the boundaries of the available land holding.
- 1.23 The proposed development is situated within an area of allocated 'Green Space' as defined in Barnsley Council Core Strategy Policy CSP35 and shown on the Proposals Maps. Green Space covers a range of uses, including: parks; play areas; local nature reserves; cemeteries; allotments; school playing fields; parks and gardens of historic interest; sites of biological and geological interest and Green Ways.
- 1.24 Policy CSP35 states that:

'where development is proposed on existing green space, an assessment must show in the first instance that there is enough green space of a particular type in the locality that it serves, a suitable replacement is provided or the development is for small scale

Co-operative Wind Turbine at Shafton Two Gates

facilities needed to support or improve the function of the green space.'

- 1.25 It is proposed by the applicant that an area at least equivalent to the new-development footprint, not previously within the Green Space, is allocated as Green Space. As such, offsetting the potential loss of area from within the Green Space as result of the proposed development. There is sufficient land within the ownership boundary of Harworth Estates to facilitate this offset adjacent to the turbine site as shown on **Figure 4** in the A3 figures section.
- 1.26 As discussed in the Planning Statement, the project is defined as sustainable development through the NPPF. The development of a co-operative turbine on this site provides the opportunity to enhance the Green Space both through its inherent sustainability and the additional community benefits.
- 1.27 Also defined by the Council's Core Strategy are Green Ways. There is such a route to the east of the proposed turbine location, separated by approximately 270m at the closest point. Green Ways are one type of green space and are covered by Barnsley Council Core Strategy Policy GS1.

Plate 4 - Site Photos



- 1.28 The turbine is proposed by the Energy Prospects Co-operative (EP), which aims to develop and then facilitate co-operative ownership and operation of a number of single turbines on land owned by Harworth Estates. The proposed turbine forms part

of a new co-operative venture which will allow individual members of the public to invest in the project and receive a reasonable financial return on their investment.

- 1.29 The EP has around 467 individual members and supports potential co-operatively-owned renewable energy schemes through the planning and development process by providing development funding. Further information on the Energy Prospects Co-operative can be found on www.energyprospects.coop.
- 1.30 EP takes a portfolio approach similar to that taken by commercial wind energy developers. The purpose of this strategy is to spread development risk and facilitate co-operative ownership.
- 1.31 The overall objective of the EP is to make co-operative ownership of renewable energy generation more available to ordinary individuals and communities in the UK. EP is part of the Energy4All (E4A) family. Energy4All Ltd. is a non-profit-distributing social enterprise and the UK's leading expert in community-owned renewable energy schemes, working primarily with community groups and landowners to develop renewable energy projects that are wholly or partially owned by a community co-operative. Energy4All is owned by the community co-operatives it creates and is unique in the UK. The Energy4All family of co-operatives has over 7,500 members in total. Members of the Fens Co-operative are shown in **Plate 5**. More information on the co-operatives can be found on www.Energy4All.co.uk.

Co-Operative Ownership

- 1.32 Energy4All will set up a new co-operative venture to own and operate the Shafton turbine, giving local people the opportunity to become members by investing in the project. Individuals can invest between £250 and £20,000 in the project. The proposed turbine will be wholly-owned by the co-op and thus by its members. Revenue from sale of the electricity generated by the turbine is used to pay operating costs with surplus revenue then being distributed to members in proportion to their investment as an annual share interest payment. A proportion of operating revenue will also be paid to a community fund to be used on community projects in the immediate vicinity of the turbine.
- 1.33 Co-operatives are democratically run and each member has one vote in decision-making, irrespective of their share holding. All members are eligible for election to the Board of Directors. Directors are elected by the members at the co-op's Annual General Meeting. One third of the Directors step-down on rotation each year. The board makes day-to-day decisions on the running of the co-op on behalf of the members.
- 1.34 Energy Prospects and Energy4All subscribe to co-operative values which include a commitment to equality, fairness, honesty and social responsibility. They also follow key co-operative principles such as operating in a democratic manner (one member one vote), autonomy and independence, co-operation amongst co-operatives and care for community. In line with these principles, the new co-op will aim to maximise the social, economic and environmental benefits of the proposed wind turbine to the local community.
- 1.35 Once the proposed turbine has received planning consent, the new co-op will raise

Co-operative Wind Turbine at Shafton Two Gates

the capital necessary to build the turbine through a public share offer and bank finance and will then progress the construction and operation of the project. The project is financed as follows:

- A share prospectus will be issued by the co-op;
- Individuals will be able to subscribe between £250 and £20,000 to become members. Priority for membership will be given to people living in the immediate area around the turbine, for example within 10km;
- The co-op (supported by E4A) organises all the necessary contracts, including any loan agreement, and oversees the construction of the turbine;
- Electricity generated by the operating turbine is sold to an electricity supplier;
- Revenue from the sale of electricity is used to pay operating costs. Some is put aside into a depreciation fund. Surplus revenue is then distributed to the members as an annual share interest payment. A payment is also made to the community fund; and
- At the end of the project life (usually 25 years), the depreciation fund is used to pay back to all members their original investment.

1.36 An example of co-operative ownership in action is provided in the following box. Further details are available on the Westmill website and in the 2012 BiGGAR Economics report on behalf of RenewableUK and the Department of Energy and Climate Change.

Plate 5 - Shareholders from Fens Co-operative, Established by Energy4All



Case Study: Westmill Wind Farm

Westmill Wind Farm was the first 100% community owned scheme in the UK. It is owned by the Westmill Co-op which now has 2,374 members. The project is built on the site of an old airfield near Watchfield, South Oxfordshire, and comprises five wind turbines with an installed capacity of 6.5MW.

The Co-op was established in 2004, ahead of the site becoming operational in 2008, with the aim of giving local people priority and opportunity to invest in renewable energy production. A share issue and fundraising campaign raised £4.6 million and was supplemented by a bank loan from the Co-op Bank.

The economic value of this project is retained in the UK, with 8% of the initial development costs kept within the local area and around 10% of the construction work undertaken by local contractors. Members of the Co-op receive annual interest on their investment and under the Government's Enterprise Investment Scheme, tax payers are able to claim back 20% tax on their initial investment. In addition, members receive advice on energy conservation which is extended to the wider community through the Westmill Sustainability Energy Trust, a charity set up by the Westmill Co-op. The objective of the Trust is to encourage and promote the deployment of sustainable energy in a 25 mile radius from the Westmill Wind Farm. The Trust receives 0.5% of the annual revenue of the wind farm, which is approximately £5 000-£6 000/ year. Also site visits and educational projects are organised by the trust and information is provided to the community via a notice board at the wind farm entrance and dedicated website.

Westmill Wind Farm Co-operative Ltd. is based on the highly successful wind farm run in Cumbria by Baywind Energy Co-operative Ltd. and is part of the Energy4All family of co-operatives. Westmill is the first project of its kind in Southern England and its importance has been recognised by the award of a capital grant from South East England Development Agency (SEEDA).

Community Fund

- 1.37 Energy Prospects proposes that the new co-op will pay a proportion of revenue to a community fund.
- 1.38 The co-op will aim to pay 1.5% to 2% of revenue into the community fund. This will amount to between £5,000 and £7,000 per year. However, the amount will be dependent upon the actual financial performance of the turbine each year and will be subject to the approval of the members of the co-op. The community fund will also benefit from an additional share of revenue once the average annual return to co-op members has reached 10%. In each year that average return to members is above 10%, the community fund will receive an additional payment of 50% of the excess profit.

- 1.39 Usually, subject to planning consent being granted, a Community Trust is set-up, which is independent of the co-op. However, Energy Prospects and Energy4All will first seek views from the local people on how best to manage the community fund. The community fund will only be spent in the communities in proximity to the turbine.

Lifetime of the Proposal

- 1.40 The proposal will operate for a period of 25 years, which is the typical lifespan of a modern wind turbine.
- 1.41 After this period of time the turbine would be decommissioned, which would involve the removal of all above ground elements and restoration of the site to its current condition. Where constructed, access tracks would remain in place following decommissioning for use by the landowner.

Expected Production

- 1.42 During its lifetime the proposed wind turbine would generate power between a minimum wind-speed, known as its 'cut-in' wind speed and a maximum wind speed, its 'cut-out' wind speed, at which it would shut down to avoid damage.
- 1.43 The 500kW EWT DW 54 has a cut-in wind speed of 2.5m/s at hub height and a cut-out wind speed of 25m/s (gale force 10) at hub height.
- 1.44 The rated capacity of the EWT DW 54 that this application is based on is 500kW. This is its maximum generating capacity. The turbine can produce this rated capacity at wind speeds of between 10m/s at hub height to its cut-out wind speed. In between the cut-in wind speed and 10m/s the turbine will produce varying amounts of electricity according to the wind speed.
- 1.45 The UK Wind Speed Database, issued by the Department for Energy and Climate Change, provides a rough 'estimate' wind speed for every kilometre square in the UK. At 45m height, the UK Wind Speed Database reports the average annual wind speed in the proximity of the turbine location to be approximately 5.8m/s. The wind speed at hub height can be anticipated to be higher. However, as no figure is provided at 50m, the 45m data is used as the basis for a conservative estimate of energy production.
- 1.46 For the 500kW EWT DW 54, EWT have published an indicative energy yield table which indicates the anticipated generation from the turbine. Using the UK Wind Speed Database wind speed figure of 5.8m/s, EWT predict (assuming standard conditions) a potential annual yield of approximately 1 500 000kWh (to 3 S.F.) (Please see **Appendix 1** of the CD Appendix). Applying a 10% loss factor associated with turbine availability and electrical losses, it is estimated the turbine could produce annually approximately 1 370 000kWh of electricity (to 3 S.F.).
- 1.47 The benefit of this renewable energy generated without fossil fuels or associated emissions can be equated to the equivalent number of homes which would be supplied with electricity from the turbine over the year. This is calculated and presented in the following box.

Annual Average Household Equivalent

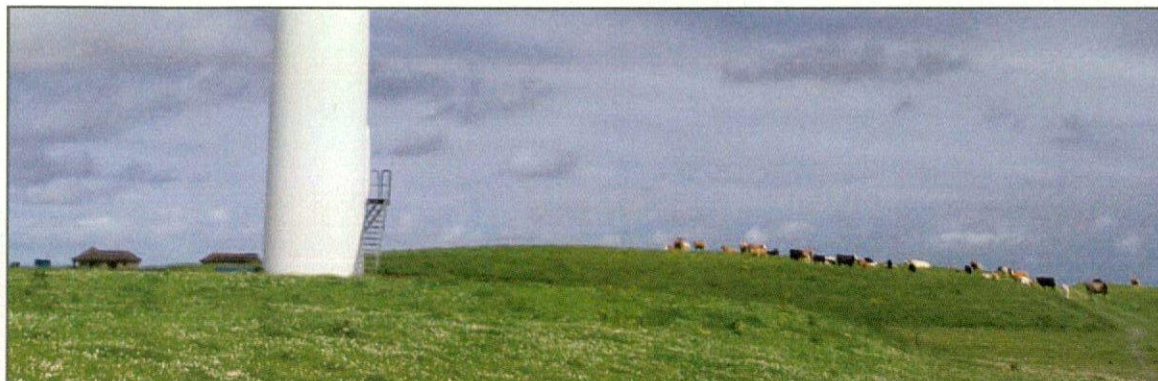
= Annual average electricity produced, kWh / annual average domestic electricity consumption for Barnsley District, kWh¹

= 1 370 000 / 3 703

= 370 households (to 3 S.F.)

1. Stated figure is taken from 'Sub-national electricity consumption statistics' published by the Department of Energy and Climate Change (DECC, 2013a).

- 1.48 The 370 households represent 8.00% of the 4 620 households within Cudworth Ward (as per Office for National Statistics Parish Profiles, 2011) (to 3 S.F.). As such, annually the turbine can be anticipated to meet the equivalent annual average domestic electricity needs of 8.00% of the households within the ward that it is located within (to 3 S.F.).



RENEWABLE ENERGY TECHNOLOGIES AND THE DRIVE FOR WIND ENERGY IN THE UK

1.49 The National Planning Policy Framework (NPPF) provides the current legal basis and guidance for determining planning applications. This document is discussed further from **Paragraph 1.67** of this report. Paragraph 98 of the NPPF advises that local planning authorities should:

- *'not require applicants for energy development to demonstrate the overall need for renewable or low carbon energy and also recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions; and*
- *approve the application ¹⁸[unless material considerations indicate otherwise] if its impacts are (or can be made) acceptable. Once suitable areas for renewable and low carbon energy have been identified in plans, local planning authorities should also expect subsequent applications for commercial scale projects outside these areas to demonstrate that the proposed location meets the criteria used in identifying suitable areas.'*

1.50 Climate change as a result of human activity is now an accepted reality. The latest report, of over 800 contributing authors from the IPCC states with 92% certainty that humans are changing the world's climate (IPCC, 2007). The results could be devastating, with alterations in world climatic patterns and changes to the sea level resulting in increased events of flooding and drought and the alteration of habitats and growing seasons around the world.

1.51 Given such a backdrop the Kyoto Protocol has drawn together 192 countries (including the European Community) in a legally binding agreement to reduce the production of world greenhouse gas emissions, in a bid to stave off the worst effects of global climate change.

1.52 In order to achieve such targets it is vital that reductions are made throughout key areas of pollution, transport, industry, housing and electricity production.

1.53 The UK's electricity supply is currently generated by a mix of coal, nuclear, gas and hydro (in Scotland and Wales) power stations with a number of coal and nuclear stations due for, or in the process of, decommissioning.