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Flimby Wind Farm Non - Technical Summary

Introduction

Flimby Hill Wind Energy Limited, a wholly owned subsidiary of West Coast Energy Limited, has submitted a planning application to Allerdale Borough Council for the development of a 3 wind turbine wind farm to generate electricity on land approximately 1.5km to the east of Flimby and 1.5km to the west of Broughton Moor in Cumbria.

The proposed wind farm has been the subject of a formal Environmental Impact Assessment (EIA), which has been fully documented with an Environmental Statement (ES) to accompany the planning application.

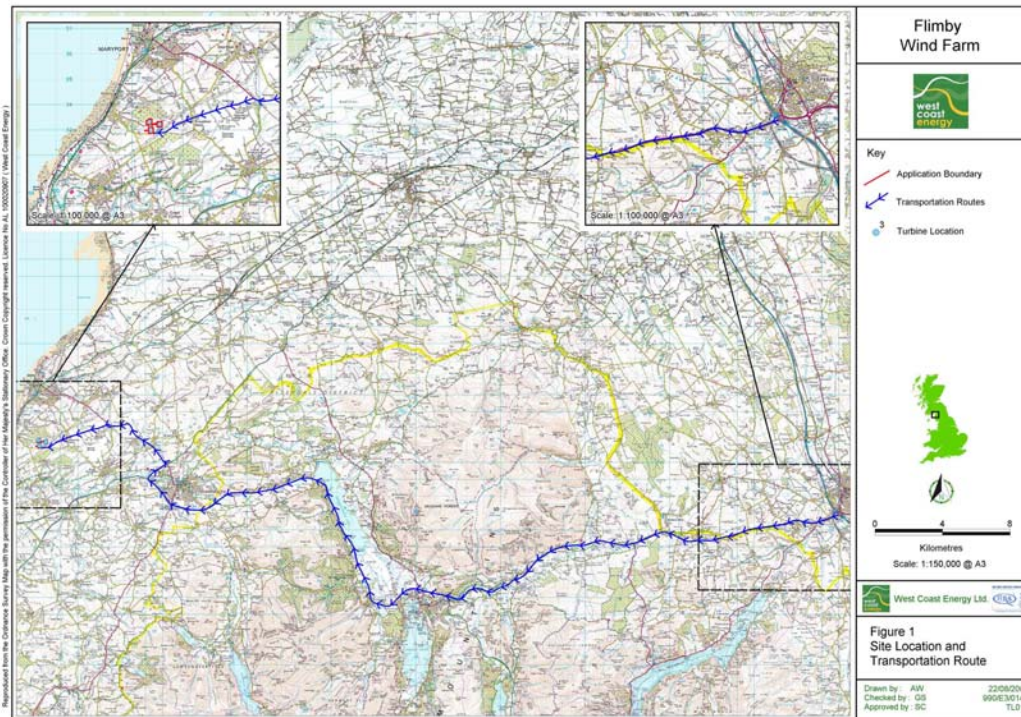
The scope of the ES was agreed in discussion with Allerdale Borough Council, and other statutory and non-statutory agencies. The ES provides environmental information to assist the Local Planning Authority in the process of the determination of the wind farm proposal.

This Non-Technical Summary is the summary of the ES, providing an overview of the proposed development, its potential environmental effects and proposed mitigation measures.

The ES comprises of:

- Volume 1 - Written Text
- Volume 2 - Appendices
- Volume 3 - Figures and Drawings
- Non - Technical Summary

Copies of the full application documentation including the ES can be purchased in paper for £150 or in CD version for £20. The Non-Technical Summary is available free of charge, separately on request. Contact: Samantha Crosby at West Coast Energy Ltd, The Long Barn, Nercwys Road, Mold, Flintshire CH7 4EW. Tel. 01352 757604 or email info@westcoastenergy.co.uk.



Wind – Clean Energy for a Sustainable Future

There is now clear evidence that global warming and climate change are a reality and have the potential to cause major adverse effects on sea levels, water supply and agriculture in the coming decades.

Within the UK, climate change is predicted to have the following impacts:

- Extremes in weather, with dry areas becoming drier and wet areas wetter;
- Increased bouts of flooding for communities;
- Increased erosion to coastal land and defences, leading to a greater flooding threat to coastal townships and loss of rare habitats;
- Significant alteration of the species composition of about half of the statutory protected areas in the UK within 50 years, due to habitat changes; and
- A decline in populations of wading birds and wildfowl which depend upon estuaries in Northwest Europe, due to rising sea levels.

A North West Regional Assembly commissioned paper¹ assessed the likely impacts of climate change on the North West. For Cumbria, it predicts annual average daily temperatures will rise between 1 - 2 degrees by the 2050's and by between 1 - 4 degrees by 2080's. By the 2080's it is predicted that summer rainfall will decrease by between 30% and 45%; winter rainfall will increase by 15% - 30%; and snowfall will dramatically decrease, initially a 10% decrease by the 2020's

¹ North West Regional Assembly, June 2003, Spatial Implications of Climate Change for the North West
www.nwra.gov.uk/downloads/documents/imported/551063150606.pdf

reducing by 45% - 85% in the 2080's. In many parts of Cumbria snow may disappear altogether in the last quarter of the century.

One of the major causes of global warming is the emission of carbon dioxide from power stations burning fossil fuels (coal, oil, gas) to generate electricity. In order to combat the threat of global warming, there is a need to obtain clean, diverse and sustainable supplies of energy from renewable sources such as wind.

The Stern Review on the Economics of Climate Change (Nov 2006) examined the causes and effects of climate change;

'An overwhelming body of scientific evidence now clearly indicates that climate change is a serious and urgent issue. The Earth's climate is rapidly changing, mainly as a result of increases in greenhouse gases caused by human activities.'

'Most climate models show that a doubling of pre-industrial levels of greenhouse gases is very likely to commit the Earth to a rise of between 2 – 5°C in global mean temperatures. This level of greenhouse gases will probably be reached between 2030 and 2060. A warming of 5°C on a global scale would be far outside the experience of human civilisation and comparable to the difference between temperatures during the last ice age and today.'

'There is still time to avoid the worst aspects of climate change if we act now and act internationally. Government business and individuals all need to work together to respond to the challenge. Strong, deliberate policy choices by Governments are essential to motivate change. But the task is urgent. Delaying actions, even by a decade or two, will take us into dangerous territory. We must not let this window of opportunity close.'

Wind Energy in Europe

Within Europe, virtually all member states are seeking to generate electricity from wind energy. Germany, Spain and Denmark lead the way with respective installed capacities of 20,621MW (Mega Watts), 11,615MW and 3,136MW. Whilst the UK has the biggest wind resource in Europe, statistics show the UK currently lagging significantly behind many of the other EU members in its rate of installing new renewable energy capacity.

Wind Energy in the UK – Sustainable Power

The UK Government is strongly committed to developing wind power and other renewable technologies. A market-based support mechanism for renewable energy places an obligation on electricity suppliers to buy an increasing proportion of electricity from renewable energy sources. In England this mechanism is called the Renewables Obligation (RO).

Renewable energy has a key role to play in the UK Government's Climate Change Programme. Renewable energy sources generally produce low or negligible levels of pollutants such as carbon dioxide and other 'greenhouse gases', and so by displacing conventional sources of energy, they can help the UK meet its climate change targets.

Renewable Energy in the North West

The North West possesses some of the best renewable energy resources in the UK. At present though, the region has only (in common with most English regions) a low level of installed capacity.

The **Draft North West Plan (The Regional Spatial Strategy)** (draft RSS), currently at the post Examination in Public stage, sets regional and sub-regional targets for renewable energy. By 2010, the target is to produce at least 10% of electricity from renewable energy sources, equating to 1231MW. On-shore wind energy is expected to make the largest contribution out of all other renewable sources to this target (600MW or 49%). Cumbria is expected to make the largest contribution (210MW or 35%) in the region to the on-shore wind energy target.

As of September 2007, Cumbria has an installed and planning consented on-shore wind capacity of 81.58MW², thus leaving a shortfall of 128.42MW to be achieved in the next 3 years.

If the draft RSS 2010 targets are to be achieved, a significant number of new renewable energy and wind energy projects must receive planning permission and be constructed within the next 3 years.

Flimby Wind Farm

The Flimby site was initially identified as potentially suitable for a wind farm for the following reasons:

- Good wind resource;
- Availability of an economically priced connection to the electricity grid;
- Favourable national, regional and local planning policies;
- No national ecological, archaeological or landscape designations;
- No detrimental effect on microwave and radio frequency links crossing the site;

² Figures from BWEA, 2006, UK Wind Energy Database
<http://www.bwea.com/ukwed/>

- No detrimental effect on aviation safety and interests
- Suitable access from the local highway;
- Landowner participation.

Further detailed assessment and consultations with the Council, consultees and interested parties confirmed these initial conclusions.

Project Description

The design of the wind farm was a dynamic process, the aim of which was to evolve a wind farm which was visually sympathetic and sustainable with the surrounding environment. There were several iterative design phases which were underpinned by a continuous process of site evaluation, environmental appraisal, and repeated consultations with relevant organisations. The final layout of the Flimby Wind Farm incorporates environmental, landscape, visual and engineering considerations, gleaned as from the EIA process, with the result that the proposed scheme inherently avoids any detrimental environmental effects. The planning application area of 14.8 hectares (ha) contains a development footprint of only 0.521ha or 3.52% of the site area

It is proposed to install 3 x 2.5MW wind turbine generators of modern design/. The maximum height from the turbine base to the top of the blade tip will be up to 102m (335ft). As the physical characteristics of individual turbine models can vary depending on the manufacturer, the turbines will have a maximum hub height of up to 67m (220ft) and a maximum rotor diameter of up to 84m (276ft). For the avoidance of doubt, all turbines erected on the site will have the same hub and rotor dimensions and a maximum base to blade tip height of 102m. For the purposes of this application a generic 2.5MW turbine

with a hub height of 60m and 84m rotor diameter has been considered.

The wind farm design as shown in the site layout plan. The wind turbines are spaced so as to minimise energy loss due to wind turbulence, to avoid sensitive areas and to minimise impact on nearby properties.

It is proposed to gain access to the site from the existing gateway onto the unnamed and unclassified road to the south of the site, located westwards of the public footpath running in a north - south direction from the road. Suitable visibility splays for the entrance will be agreed with the local planning authority. Access to individual turbines is proposed by purpose built site tracks. The turbines will be connected by underground cables, which will take power from each turbine to a substation at the site.

The substation would connect to the existing single circuit 33kV line running Stainburn and Maryport. The local electricity distribution company, United Utilities Electricity plc, has confirmed that there is sufficient capacity within this circuit to accommodate the proposed electricity generation at Flimby. This connection will be subject to a separate application under Section 37 of the Electricity Act 1989.



Wind Farm Construction and Operation

The wind farm will take approximately five months to construct. The access entrance will be designed to allow all construction traffic, in particular abnormal loads, to turn safely onto the site access track. The design of the junction, route to the site and onsite access tracks would meet the requirements of the Highway Authority with regard to visibility, construction materials, surface water drainage, gradient and safety of other road users.

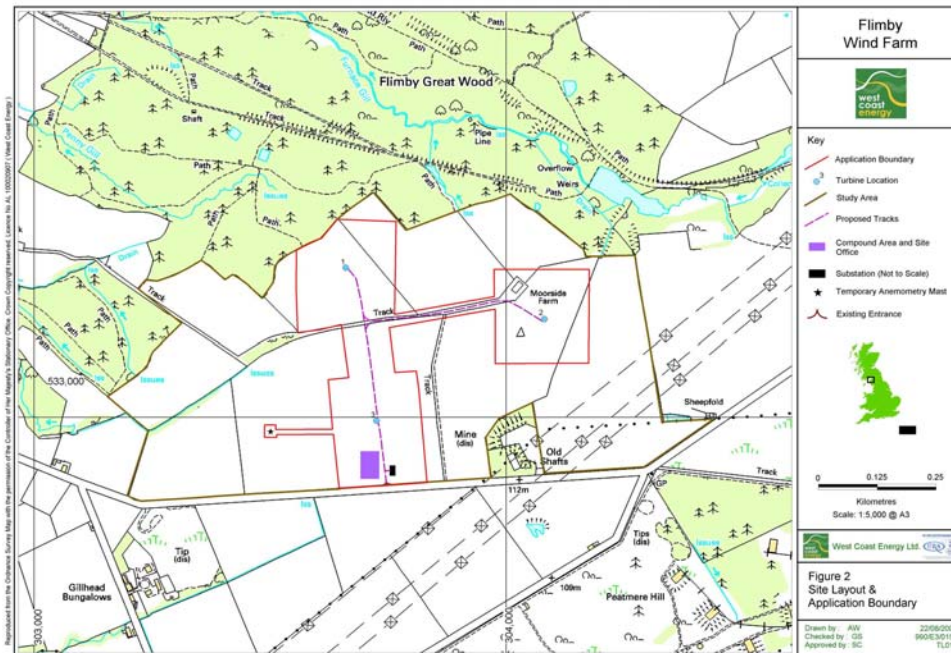
During the construction period, there will be three types of traffic accessing the site – exceptional loads, conventional HGVs, and the vans and cars of construction staff.

There will be around 34 exceptional loads, 24 of which will deliver the tower sections, blades and components of the turbines and the associated electrical equipment. The remaining ten will deliver the mobile cranes and other construction plant. With the exception of the cranes, some of the long vehicles delivering the large loads will reduce in length for their return journey, thus reducing their impact.

Aggregate material for track construction, crane hardstandings, substation hardstanding and the temporary site office area will be sourced from local quarries and imported to the site, requiring approximately 600 HGV loads.

Concrete for the foundations will be delivered from local ready mixed batching plants, and each turbine foundation will require approximately 55 lorry loads (165 in total). There will also be around 190 deliveries of plant, machinery etc and around 12 loads of steel reinforcing, ducting and foundation bolts. It is estimated that the total number of HGV vehicle arrivals would be approximately 967 for the whole 5 month construction phase, equating to approximately 7-8 HGV loads per day if importation is evenly spread throughout this period.

There will be approximately 20-30 people working on site at any one time during the period of construction and there will be various light vehicle deliveries. These vehicles will approach the site from various directions and will not create any noticeable impact during the construction period



Viewpoint 1 Broughton Moor

Predicted View



Viewpoint 2 Crossroads at Camerton Grange

Predicted View



Viewpoint 3 Flimby



Viewpoint 8 The Howe, Workington



Benefits

The cost of the wind farm is expected to be over £7.5 million, representing a significant investment in Cumbria. The provision of site facilities, construction materials such as concrete and aggregate, together with general civil engineering and technical services would benefit local companies, contractors and their employees. Previous experience suggests that 20-30% of the project's value is available for local construction companies to tender, with additional indirect expenditure in local shops, hotels, service stations etc.

Using the standard capacity factor of 30%, which takes into account the intermittent nature of wind frequency and speeds, it is calculated that once built the turbines would generate in the region of 19,710MW of electricity each year. Based upon the average UK household electricity consumption of 4,700 kWh per annum,³ it is calculated that the proposed wind farm will generate enough electricity to power the annual domestic needs of approximately 4,193 homes or 10,064 people. This is equivalent to making 99% of the wards of Flimby, Seaton and Ewanrigg self sufficient in clean and sustainable renewable energy.⁴

As every unit (kWh) of electricity produced by the wind displaces a unit of electricity which would otherwise have been produced by a power station burning fossil fuel, there would be significant carbon dioxide and other green house gas emission savings over its 25 year operational period.

The proposal will assist in the delivery of the Region's climate change commitments and sustainable development strategy, and make an important contribution to Cumbria's 2010 target of 237.3MW of electricity production from renewable sources and 210MW of electricity production from onshore wind schemes.

Wind energy also provides security of energy supply by providing a greater diversity in the energy mix which is indigenous, independent of outside fuel sources and undepletable.

To provide local benefit arising from the wind farm development, Flimby Wind Energy Limited is presently investigating the opportunities to establish a community wind farm trust. This will enable support to be given to local social, educational and environmental initiatives. Discussions will take place with the local Parish Councils and Allerdale Borough Council on the mechanism for the legal delivery of the trust.

There is no evidence from past events or trends which indicates that the construction of a wind farm results in a fundamental or material change in population, structure of the local community, local services or employment. Surveys show that tourists are not discouraged from visiting areas in which there are wind farms and that people living close to wind farms tend to feel positively towards them.

³ BWEA (2002). Calculation for Wind Energy Statistics.
<http://www.bwea.com/edu/calcs>

⁴ Population statistics from National Statistics.
<http://neighbourhood.statistics.gov.uk/dissemination/>

Environmental Impact

Early consultations with Allerdale Borough Council and other stakeholders identified the key environmental and amenity issues to be considered in determining the planning application. These are fully addressed in the Environmental Statement which includes reports on landscape and visual amenity, noise, ecology, geology, hydrology, cultural heritage, safety, and the effects of the proposal on television and other communication systems. Where appropriate these reports have been commissioned from independent expert consultants. The main conclusions are summarised in this document.

Landscape and Visual Impact

An independent landscape and visual impact assessment (LVIA) of the wind farm was undertaken, involving a review of landscape character and designations, and evaluation of a range of viewpoints around the proposal site. Computer generated images of the wind farm were superimposed on photographs to create photomontages which give an accurate impression of the scale and location of the turbines

The LVIA found that there would be no loss of landscape character features arising from the proposals. No nationally designated landscape interest will be directly affected, and there would be no significant effects upon the Lake District National Park, the Solway Coast AONB, or Hadrian's Wall World Heritage Site.

In terms of cumulative effects with other wind farms, the Flimby Site generally forms a small group that appears unconnected with the other wind farms, and thus the cumulative effects are considered at most to be of a Minor level of significance and more commonly of Negligible significance.

The LVIA concluded that overall the proposal is sufficiently small (in turbine numbers) to cause a relatively low degree of high impact significance, and where high impacts are predicted, the nature of the effect need not be a directly intrusive (adverse) effect. The turbines could be seen as a harmonious element, contributory to, rather than adversely (reducing) the visual amenity, landscape value and quality.

The predicted effects at a close range upon the landscape character of the locality will be a Moderate significance. In a wider landscape context the indirect effects upon landscape character will be Minor or Negligible.

As with any scheme of this nature, there will be a change to the landscape and a degree of local visual impact, but if Government and regional targets on renewable energy and onshore wind are to be met, it must be accepted that wind turbines do have a place within the landscape and countryside.

The turbines will be of modern 3 blade design and will be painted an appropriate matt colour, to be specified by the Local Planning Authority. A matt colour reduces the distance over which the turbines are visible, especially in dull weather conditions or low light conditions.

Four predicted views (photomontages) of the wind farm from Broughton Moor, the crossroads at Camerton Grange, Flimby and The Howe in Workington are shown in this document.



Ecology & Ornithology

An independent study into the ecological impacts of the proposed wind farm has been undertaken. It found that the application site is not located in any area notified or classified or designated for wildlife interests under either domestic or international legislation. None of the habitats within the application area are of significance in an international, national or county context.

With the provision of appropriate buffers around the woodland edge and hedgerow habitats as proposed as part of this scheme, there would be no adverse impact on bats within the area. Although there would be some potential for great crested newts to be using the terrestrial habitat within the application area, mitigation would ensure that there would be no impact upon newt populations.

The study concluded that with the provision of mitigation, there would be no adverse impact on the ecological resource of the application area and surrounds. The recommended mitigation measures would be undertaken prior to the commencement of development should planning permission be granted.

Cultural Heritage

Independent archaeologists were engaged to undertake an assessment of the wind farm site. The study found that there are no archaeological or heritage features with statutory designations nor features of regional significance within the study area. Eleven sites of local cultural heritage significance were identified, of which it is predicted that there will be a direct impact by the proposed development on four. The significance of impact in all four cases is judged to be low, provided that the proposed mitigation measures are followed, due to the fact

that the proposed development will impact on only a small area of the total area of these sites and that they are all judged to be remains of local significance.

All ground breaking works associated with the proposed development would be subject to an archaeological watching brief. A landscape survey using an Electronic Distance Measurer (EDM) or a laser scanner would be undertaken prior to development works to provide *preservation by record* of the ridge and furrow features. The exact scope of the evaluation and all mitigation measures would be agreed in consultation with Cumbria County Council Archaeology Service prior to implementation.

Geology & Hydrology

Independent consultants were engaged to undertake an assessment of the potential impacts on the geology, soils and hydrology of the wind farm site.

The study found that with the appropriate site procedures and proposed mitigation measures there would be no material impact on any surface water courses and local supplies sourced from these surface waters; nor impact on the geology or hydrogeology of the area, which includes the consideration of groundwater, source protection zones, aquifers and local water supplies.

All mitigation measures would be set out within both a Construction Method Statement (CMS) and an Environment Management Monitoring Plan (EMMP), which would be produced prior to the construction of the wind farm.

Noise

An independent Noise Impact Assessment has been undertaken by comparing the predicted noise levels with noise limits described in ETSU-R-97, Assessment of Rating of Noise from Wind Farms, as referred to in PPS22. The noise measurement and predictions focussed on the nearest residential properties to the proposed wind farm.

The assessment found that the predicted noise levels at the nearest residential locations to the site meet the night time and day time limits under all conditions.

Noise from the proposed development will therefore not detrimentally impact on residential amenity and is a matter that can be adequately controlled by the imposition of appropriate planning conditions and, if necessary, by legal agreement.

Interference with Television, Radio and Microwave Paths

Based on consultation with the relevant bodies, the development will have no effect on any existing microwave and radio frequency links.

Public Rights of Way

Small sections of two public footpaths and a bridleway run through the application site. Measures will be undertaken to ensure these existing routes remain open and useable during the construction and operational periods. The routes will be unaffected once construction work is completed.

Public Safety

There is no recorded incident of a member of the public being injured by a wind turbine. The UK Government considers wind energy to be a 'safe' technology, requiring no special safety provisions. Experience has shown that livestock are undisturbed by the movement of the blades and will graze underneath them as well as using the towers for shelter in bad weather. Farming at the site will not be affected by the development.

The wind turbines are designed and manufactured to withstand weather conditions at least as extreme as those occurring in the United Kingdom, in terms of wind speed, turbulence and temperature. The wind turbines are equipped with safety systems which will automatically shut down the machine should a fault occur

Turbine blades have been designed to discourage any build up of ice as this would cause the rotor of the turbine to go out of balance and the wind turbine would have to be automatically shut down. In the event that ice should accumulate on the turbine components the turbines would be stopped to allow time for the components to be pre-heated.

Shadow flicker can arise from the passing of the moving shadow of the turbine rotor over a narrow opening such as the window of a nearby residence. Various conditions need to be met to create a shadow flicker effect. There is the potential for a few residences to be affected by shadow flicker, however this, in all cases, will not exceed 1 to 20 hours per year and is based on a worse case scenario, having only considered topography and having discounted factors such as screening by existing vegetation, lack of wind speed and cloud cover, which serve to reduce the occurrence of shadow flicker.

As a mitigation measure, any wind turbine causing shadow flicker can be switched off on those dates and at those times when shadow flicker could potentially occur, and also if natural light levels and wind speeds are sufficiently strong. The impact of shadow flicker to local residents is therefore considered to be minimal.

Decommissioning

On cessation of wind farm operations, all major equipment and structures will be removed from the site. This process will take approximately one month. The upper sections of the foundations will be removed to a depth which would permit the continuation of current agricultural practices. Unless requested otherwise by the landowner, additional on-site access tracks will be removed and the affected area reinstated. The control building will also be removed from the site and the area reinstated as appropriate. All underground cables will be left in place. All crane hardstandings adjacent to turbines will be removed and reinstated.

Conclusion

The proposed wind farm is clearly in accord with the principals of sustainability and will provide significant environmental, social and economic benefits.

The environmental impact assessment process indicates that the proposed development will have a relatively low impact on the immediate and wider environment. As with any scheme of this nature, there will be a change to the landscape, but If Government and regional targets on renewable energy and energy from on-shore wind are to be met, it must be accepted that wind turbines do have a place within the landscape and countryside.

The wider environmental, social and economic benefits of renewable energy schemes, whatever their scale, are a material consideration which, according to Government advise, should be given significant weight in the decision making process. Support for the development of renewable energy sources in appropriate locations is advocated in national planning policy, energy policy and within the Development Plan.

On balance, weighing up all of the above factors, it is considered that the environmental, social and economic benefits of the proposed development outweigh its relatively low impact on the local environment. The proposal is in accordance with the spirit and provisions of the Development Plan and there are no material considerations of such weight that justify a refusal of the application.

Further Information

If you would like to find out more about the Flimby Wind Farm proposal, you can read the full Environmental Statement at Allerdale Borough Council planning department or, alternatively copies of the full application documentation including the Environmental Statement, can be purchased in paper for £150 or in CD version for £20.

For further details about this project, please contact Samantha Crosby at West Coast Energy Ltd, The Long Barn, Waen Farm, Nercwys Road, Mold, CH7 4EW. Tel: 01352 757604 or email info@westcoastenergy.co.uk.



