

Fleeter Wood Wind Farm

November 2007

Frequently asked questions

"Climate change is the most severe problem we are facing today."
Sir David King, UK Government's chief scientific adviser

Today climate change is a daily concern of people and governments around the World. It is stated as the key reason for people at Novera's public consultations for supporting wind farms such as Fleeter Wood.

It is now widely accepted throughout the scientific community and internationally at government level, that the recent rise in global temperature (global warming) is being driven by the increase in greenhouse gases emitted as a result of human activities and that the increase and rate of increase in greenhouse gases, such as carbon dioxide, is far greater than has been seen during the known history of our planet. Studies have shown that the majority of this carbon dioxide is derived from the burning of fossil fuels, with laboratory analyses showing that the levels of carbon dioxide in the atmosphere are now 35% greater than they have been for at least the last 650,000 years (Source: A Simple Guide to the Climate Change Controversies, The Royal Society 2007).

What will be the effect on us in the UK?

It is predicted that our UK climate will become warmer, with drier summers and wetter winters and an increased occurrence of extreme weather events, such as storms and flooding. Sea levels around the UK are expected to rise due to the melting of polar ice sheets and glaciers and also the thermal expansion of the water in our seas. There are also increased risks of storm surges in coastal and low-lying areas. Our natural landscapes and the native wildlife they support are predicted to change and we may see the extinction of many species which are commonplace today. We are at a critical point where decisions made now can have a real impact on limiting our greenhouse gas emissions and as a result how the future climate will change. The exciting challenge we face is to make and influence decisions that will achieve the critical greenhouse gas emissions reductions needed, by using renewable sources of energy and reducing emissions of greenhouse gases. Every small contribution adds to the overall impact and we have the opportunity to make a very positive difference to our world and the one that future generations will look after.

Frequent queries and comments

Novera Energy is progressing proposals for a planning application for a wind farm, to be known as Fleeter Wood Wind Farm, on land southeast of Dearham, Maryport.

During the public consultations held for the proposed Fleeter Wood Wind Farm in September 2007 (then known as Townhead Wind Farm) a number of questions and comments were put to Novera. The most frequently asked questions were the following:

1. The site is large – will there be more turbines following on once the wind farm is built?

Novera has no plans to expand the wind farm in the future. The now completed investigation of the opportunities and constraints has concluded that expansion of the current site and layout is not feasible.

Although it was initially thought to be possible to design a layout of 8 wind turbines in the middle of the site area, this will not in fact be possible due to the various constraints now known on the site.

2. Wind turbines are only 30% efficient and don't generate much electricity.

Modern turbines produce useful electricity for 70-85% of the time (BWEA website www.bwea.com/ref/faq.html, at 8th November 2007), as the turbines respond to the changing wind speeds.

The "capacity factor" (or "load factor") of a wind turbine is an expression of the electricity that it has generated in any period as a percentage of the theoretical maximum it could have generated if running continually at maximum output. In the case of modern commercial wind energy developments in the UK, this "capacity factor" is generally around 30%.

Wind turbines are, however, specifically designed to operate in a variable way to respond to the changes in wind speed, and to maximise the conversion of this free and infinite (renewable) source of energy into electricity. The efficiency of a conventional thermal power station, however, relates to the percentage of the energy within the fuels they consume which is converted into electricity, and is not comparable to the capacity factor of a wind turbine. Coal and gas-fired power stations have thermal efficiencies of a little over 35-45%, with the remaining majority of the energy from the fossil fuels they burn being released as waste heat, usually in the form of steam.

One 2 MW wind turbine at a reasonable site would produce over 5.2 million units of electricity each year, enough to meet the average annual needs of over 1118 households (this calculation is based on the BERR's (previously known as the DTI) current figure for average annual household electricity demand of 4,700 kWh; Digest of UK Energy Statistics, 2005).

With a maximum of 5 turbines at Fleeter Wood, and a capacity of 10MW, the project will generate equivalent to the annual average electricity needs of approximately 5,500 homes.

3. Wind turbines don't reduce CO₂ emissions, but create CO₂.

It is almost universally agreed by the scientific community that global climate change is the single biggest environmental threat facing the planet. Climate change is now a real threat to future generations, and is predicted to cause increasingly unpredictable and severe weather patterns with potentially catastrophic effects on agriculture, wildlife, human health and the global economy.

By using more renewable energy sources such as wind power, we can help to tackle this threat by reducing harmful carbon dioxide emissions. Wind energy generation is clean and does not produce polluting carbon dioxide unlike coal, oil and gas. Investing in renewable technology is a long term commitment and is part of the solution to securing our future energy needs.

Renewable energy is an integral part of the Government's longer-term aim of reducing CO₂ emissions by 60% by 2050. The Government has set a target that 10% of the UK's electricity should be supplied from renewable energy by 2010 and 20% by 2020. In 2005, 4% of the UK's electricity supply came from eligible sources of renewable energy. During the same period, 4.2% of the UK's electricity supply came from all sources of renewable energy. (The Department for Business Enterprise and Regulatory Reform, www.berr.gov.uk).

The manufacturing, construction, maintenance and decommissioning of wind turbines does emit CO₂. However, this is a very small proportion compared to the emissions offset from the lower reliance on conventional fuel generation like coal and gas.

The Parliamentary Office of Science and Technology Postnote, Carbon Footprint of Electricity Generation (Number 268, October 2006, www.parliament.uk/documents/upload/postpn268.pdf), explains the carbon footprints of various generating technologies. This states the lifecycle CO₂ emissions (i.e. including emissions from all stages of the plant, including manufacturing and construction etc) for onshore wind to be 4.64g of CO₂ equivalent per kilowatt-hour (g CO₂ eq/kWh) of electricity generated over its lifetime, which compares to 500g CO₂ eq/kWh for gas-fired power stations and around 5g CO₂ eq/kWh for nuclear plant. The fossil fuel power station carbon emissions offset through wind generation would thus repay the emissions from its manufacture and construction in just a few months.



4. Doesn't Cumbria have enough wind farms already?

There are a number of wind farm applications in the planning pipeline in Cumbria but the local planning authorities and the Department of Trade and Industry (where appropriate) are ultimately responsible for deciding how many will be approved, and how these will fit in with the targets detailed in the Submitted Draft Regional Spatial Strategy for the North West of England (Government Office North West, January 2006).

This Strategy has set a target for Cumbria for 2010 to have between 13 and 18 onshore wind farms or wind clusters, generating approximately 210MW of electricity. By 2020 Cumbria is expected to have approximately 247.5MW of wind power. Currently Cumbria has 13 wind farms with a total of 86MW of wind power installed, so it still has a long way to go to reach these targets, as does every region in the UK.

5. Shouldn't we be building wind turbines at sea or using other forms of renewable energy?

Ultimately all forms of renewable energy will form part of the solution to climate change. At the moment onshore wind power is the most developed form of renewable energy that we have available.

We need a diverse energy mix including renewable generation to ensure an adequate level of energy security and it is important to consider alternatives to wind. Energy efficiency represents a low cost and effective way of reducing energy consumption and there is no doubt that households and the private and public business sectors can do more. At present onshore wind, land fill gas, energy from waste and certain forms of biomass are the most commercially viable and technically mature technologies.

Based on work during the Government's energy policy review in 2002 onshore wind is predicted to become the cheapest source of electricity by 2020. Less mature renewable technologies such as offshore wind and wave power are expected to play an increasing role although they currently cost more than the more mature technologies such as onshore wind.

There have been a number of offshore wind projects approved recently but building turbines in a marine environment presents specific difficulties such as maintenance and construction at sea as well as difficulties in establishing a grid connection. Currently onshore wind remains the most commercially viable option to develop renewable energy sources.

6. Aren't wind farms subsidised by the Government to make them economical?

All forms of renewable energy attract a financial incentive as a means of encouraging development. This is normal, and in the past, every source of power generation, including oil, coal, gas and nuclear, has needed financial support in order to reach the stage where it is commercially viable.

Currently, this Government supports renewable energy via the Renewables Obligation (RO) scheme, however this is not a cash subsidy from the Government. Each megawatt-hour (MWhr) of renewable energy is awarded a Renewable Obligation Certificate (ROC) and electricity suppliers are obliged to source a percentage of their power by generating ROCs themselves or by buying ROCs from other generators, thus guaranteeing a market for cleaner electricity sources.

7. Is it true that wind farms are noisy and create health problems?

Operational wind turbines do produce some noise but are remarkably quiet. Continuous development in wind turbine technology means that mechanical noise from equipment in the nacelle is no longer considered to be significant. The main sound is the swoosh of the blades as they rotate and is most noticeable when heard at close proximity to a turbine. Government guidance on wind farm noise emissions ensures the protection of people living nearby by limiting the noise to acceptable levels.

In response to concerns that wind turbines emit infrasound and cause associated health problems, Dr Geoff Leventhall, Consultant in Noise Vibration and Acoustics and author of the Defra Report on Low Frequency Noise and its Effects, says:
"I can state quite categorically that there is no significant infrasound from current designs of wind turbines."

Professor Peter Styles and his team at Keele University have also recently prepared a statement seeking to address misinterpretation and confusion regarding low frequency noise. This states that:
"the levels of vibration from wind turbines are so small that that only the most sophisticated instrumentation and data processing can reveal their presence as they are almost impossible to detect" and
"there is no possibility of humans sensing the vibration and absolutely no risk to human health".

Shadow flicker is another effect of concern to people. It can occur at certain times of the year when the sun is low in the sky and shines on a building from a position directly behind a turbine rotor. In such circumstances moving shadows from the turbine blades can be cast over the building's window openings causing 'flickering' within the building as the blades rotate. In practice shadow flicker will only be experienced within buildings in close proximity to a wind farm which have windows facing the turbine(s), through which the turbines can be seen in specific directions in relation to the sun position. At distances equivalent to 10 turbine rotor diameters or more (about 800m or just over half a mile for the Fleeter Wood proposal) a person should not experience shadow flicker as they would view wind turbines as objects with the sun behind them rather than as objects 'chopping through' sunlight.

In any circumstances where Novera operates a wind turbine(s) where the conditions which cause flicker are predicted, the turbines will be stopped automatically during the period when flicker could occur.



8. Do wind farms affect tourism?

There is no evidence to suggest that wind farms negatively affect tourism. In fact, the UK's first commercial wind farm at Delabole received 350,000 visitors in its first 10 years of operation, while 60,000 visitors have visited to take the turbine tour at the Eco Tech Centre in Swaffham, Norfolk. A MORI poll in Scotland showed that 80% of tourists would be interested in visiting a wind farm. Wind farm developers are often asked to provide visitor centres, viewing platforms, parking areas and public access to their sites. A study carried out for Friends of the Lake District in 2003, found the following opinions of tourists and tourism organisations operating at the boundaries of the Lake District National Park:

- 87% of visitors/tourists and 88% of tourism organisations felt positive towards wind farms
- The vast majority of tourism organisations reported no effect on their business from the presence of an existing wind farm in their vicinity, nor did they expect any effect associated with the proposal for a new wind farm
- 75% of tourists said that increases in the number of turbines in the next few years would not have any effect on them visiting in the future.

9. Do wind farms affect house prices?

A wide range of factors affect the market value of residential property, not least people's own perceptions. Two recent research studies by the Royal Institute of Chartered Surveyors (RICS) suggest that wind farms do not affect property values in a uniform way (positively or negatively) and there is no conclusive evidence to suggest that any effect is lasting. These surveys found that the perception that wind farms may impact on house prices is fuelled largely by misunderstanding about wind farms and the 'fear factor' arising from the prospect or uncertainty of a wind farm being constructed at a particular location.

10. Do wind farms affect TV reception?

In some circumstances wind turbines can cause interference to local TV reception. TV and telecommunications operators are consulted as part of the Environmental Impact Assessment to ascertain if there is any likelihood of this occurring. Any impacts that do occur in practice can be easily rectified by the developer by realigning or upgrading the affected household's TV aerial or installing additional transmitting equipment locally. This is usually enforced by a condition of the planning consent issued by the planning authority.

Sources:

1. A Review of Published Research on Low Frequency Noise and its Effects, Report for Defra by Dr Geoff Leventhall Assisted by Dr Peter Pelmeare and Dr Stephen Benton, May 2003. <http://www.defra.gov.uk/environment/noise/research/lowfrequency/pdf/lowfreqnoise.pdf>
2. The statement by Professor Peter Styles, President, Geological Society of London and Sam Toon, Keele University, Staffordshire, can be seen on the BWEA website: http://www.bwea.com/ref/tn_keele.html
3. Sustainable Development Commission case study, Community Support for Wind Turbines. http://www.sdcommission.org.uk/communitessummit/show_case_study.php?00090.html
4. MORI survey on public attitudes to wind farms; Public Attitudes to Wind Farms, A survey of Local Residents in Scotland (MORI Scotland, 2003).
5. Star Consultants, Leeds Metropolitan University, 'A Study into the Attitudes of Visitors, Tourists and Tourism Organisations towards Wind Farms on the Boundaries of the Lake District National Park', for Friends of the Lake District (FLD), October 2003
6. Royal Institute of Chartered Surveyors report; Impact of wind farms on the value of residential property and agricultural land (RICS, November 2004).

Royal Institute of Chartered Surveyors Research report; What is the impact of wind farms on house prices? (RICS Research and Dr Sally Sims and Peter Dent, Oxford Brookes University, March 2007). <http://www.rics.org/Enviro/menara/dandconsultancy/Energy/RenewableEnergy/Wind+Farm+FBRE.htm>

For more information on wind farms, please look at the following sources:

The British Wind Energy Association:
www.bwea.com and www.embracewind.com

BWEA Fact sheets:
<http://www.bwea.com/energy/briefing-sheets.html>

The Government's independent advisory body on sustainable development:
www.sd-commission.org.uk

The Department for Business, Environment and Regulatory Reform (BERR, formerly the Department of Trade and Industry) renewables site:
www.dti.gov.uk/energy/sources/renewables/index.html

The Royal Society for the Protection of Birds:
www.rspb.org.uk/ourwork/policy/windfarms/index.asp

BBC Weather Centre:
www.bbc.co.uk/climate/impact/

Royal Institute of Chartered Surveyors:
www.rics.org

Report on the Impact of Wind Farms on Residential Property Prices – Crystal Rig Case Study (Edinburgh Solicitors' Property Centre, February 2007), available from ESPC. See www.espc.com

The Government Office North West's Submitted Draft Regional Spatial Strategy for the North West of England (January 2006):
http://rpg.nwra.gov.uk/uploads/rpg_docs/rp_kMqZ_Submitted_Draft_Regional_Spati.pdf

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