Frequently Asked Questions
Cotton Wind Farm

This insert seeks to answer many of the commonly asked questions that were sent to us on comments postcards following the initial consultation in November 2007.

How many turbines will there be?

There will be a maximum of 8 wind turbines on the site. Large gaps are required in between each turbine to ensure that they operate efficiently. If sited too close together, the turbulence created behind each turbine will adversely affect those down wind. Given these siting restrictions, and the various environmental constraints, the site has the capacity for eight turbines. Any more than this would impact on their effectiveness to generate electricity.

How large are they?

We are proposing tip heights of up to maximum of 127metres above ground level. We cannot be absolutely specific about the heights of the turbines and anemometry mast, since this will depend upon which turbine is the most appropriate for the site at the time of building, should planning permission be given for the wind farm. Any planning application that we submit however will state a maximum height for the wind turbines of turbine of 127m. This is the height that is being assessed in all of the environmental work, the results of which will be submitted with the planning application. The turbines selected for a site can be smaller than the size in the application, but no taller.

Why do they have to be that high?

Wind speed increases with height above ground level, so the taller the wind turbines, the greater the wind speed and the more electricity they generate. The scale of turbines we are proposing to construct are typical of the size of turbines being proposed at sites across the country today. For comparison you may wish to visit existing operational wind farms nearby. Ranson Moor Wind Farm (to the south-west of March) comprises five wind turbines with an overall height to tip of 107m. Red Tile Farm, near Chatteris comprises twelve turbines with an overall height to tip of 100m. The turbine at Ness Point at Lowestoft in Suffolk has a tip height of 126m.

How much electricity will the wind farm generate?

A wind turbine is rated depending upon its maximum potential output of electricity. There are a large number of different makes and models of wind turbines on the market. We cannot know at this stage which is the most appropriate turbine for the site. We are considering turbines with a generating capacity of between 2 megawatts (MW) and 3MW each at this site. As we know the site has room to accommodate up to 8 turbines, we therefore anticipate that the wind farm will have a total generating capacity of between 16MW and 24MW.

We have been measuring wind speeds on the site since June 2005. We therefore know on average how much electricity a variety of different wind turbines (of varying generating capacity) will generate. Using this data, we have calculated that a wind farm comprising 8 wind turbines at Cotton Farm could meet the average annual electricity needs of between 6,900 and 10,000[2] homes each year, depending on the exact type of turbine installed.

Is the site windy enough?

A wind turbine is rated depending upon its maximum potential output of electricity. We are considering turbines of between 2MW and 3MW each at this site. The average turbine operates at full capacity (maximum electricity output) once the wind speed reaches 15 metres per second (or 33 miles per hour). If the wind was constantly blowing at 33 mph or within a range, higher all day, every day of the year, the

wind turbines would operate at nearly 100% capacity. However, the wind speed is variable and turbines are deliberately sized above the average output level to maximise generation in good winds.

Within the UK, the average wind turbine operates, on average, over the course of the year at 27% of its maximum theoretical operating capacity[1]. This figure of 27% is known as the capacity factor and is related to the design of the turbines, in particular rotor diameter and generator size and site conditions, importantly wind speed (which varies with hub height). At Cotton Farm, using the wind speed data collected from the site, we have calculated the likely capacity factors of the proposed wind farm using a range of 7 different turbines that are currently on the market. The average site specific capacity factor of these seven different wind turbines is 26% (assuming an 80m hub height).

It is important to note that the capacity factor is NOT a measure of the efficiency of a generator: efficiency is a measure of the energy input to the system versus the useful energy that is output. Capacity factor is certainly not an equivalent as it relates solely to energy output (electricity generated) without reference to energy input (the energy in the wind). In the case of wind turbines where the fuel is free and renewable, the measures of 'efficiency' do not have the same meaning as for traditional generators.

Will there be more traffic on local roads?

There would be more traffic on local roads during the construction phase which would last no more than a year. A new site entrance is proposed on Toseland Road to the south of Graveley. The access study that has been carried out shows that the abnormal loads, such as the large turbine components will be routed via the A428 from the east and Toseland Road and therefore will not pass through villages. It is anticipated that the vast majority of any construction traffic would use this route.


npower renewables Causeymire Wind Farm, tip height 101m.

During the operational phase, traffic visiting wind farm sites is minimal. Under normal circumstances, this is one or two visits to the site each week by a member of our Operations team, in a standard 4x4 vehicle.

How much energy is used in the construction of the wind farms?

Independent work has been carried out looking into this question. A paper by David Milborrow (2005)[3] concluded that the amount of energy used in the construction of a wind farm, including manufacture, transport and construction of wind turbines and foundations is paid back by the wind farms in a period of 6 months to 9 months after the wind farm becomes operational.

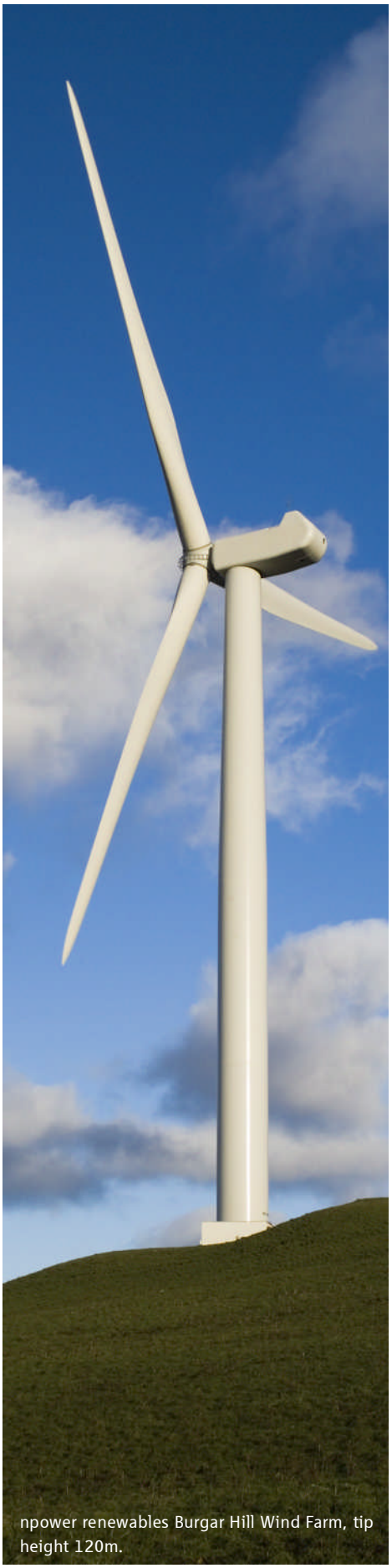
What else will need to be constructed other than the wind turbines?

Access tracks are required to link up the new site entrance, wind turbines, anemometry mast and substation. The layout of the tracks has been designed, as far as possible, to follow the route of the existing tracks on site, left over from the use of the site as an airfield. Proposed new sections of track have been kept to a minimum.

The substation would only need to be a relatively small, single storey building located amongst existing farm buildings. Anemometry masts are slimline lattice towers that are the same height as the hubs of the turbines (around 80m tall). A mast is required to monitor the performance of the wind turbines.

The wind farm will connect into the local electricity distribution network by underground cables, so there will be no additional visible infrastructure for the grid connection other than the substation.

What happens to the land surrounding the turbines?



npower renewables Burgar Hill Wind Farm, tip height 120m.

While wind turbines are *in situ*, the land around the turbines and tracks is within the control of the farmer who owns the land. At the vast majority of wind farm sites in the UK, the farmers decide to carry on farming the land, whether that is arable farming or livestock.

How long will the turbines be there for and what will the site look like once they've gone?

We will be applying for planning permission for the turbines to operate on the site for 25 years. After this time we would have to remove the turbines from the site. We would remove a top layer from each of the concrete foundations to ensure that normal farming practices can take place on the land where the turbines were previously sited.

Any new wind farm tracks would follow the route of the existing airfield tracks on the site (dating back to when the site was the WWII base RAF Graveley) as far as possible to protect the historical identity of the site. Any new access track that has been laid solely for the purposes of the wind farm would be removed. The substation and anemometry mast would also be removed, in accordance with the requirements of the planning permission.

Isn't wind power expensive compared to other forms of energy generation?

Onshore wind power is already one of the cheapest forms of renewable energy per kilowatt hour, with the potential for even further cost reductions as the technology develops.[4]

A report by the Sustainable Development Commission (2005) states that "onshore wind is projected to become the cheapest source of electricity by 2020. This is due to sustained reductions in costs for wind power plant combined with increased costs for fossil fuels, particularly coal and gas."[5]

Is wind power subsidised?

There are no direct subsidies for wind farms. Since 2001 the UK's electricity suppliers, such as npower, British Gas, Powergen (now EOn) etc have been obliged (under the Renewables Obligation) to buy a percentage of their electricity supply from renewable sources or pay a surcharge for each megawatt hour (MWh) of shortfall. This surcharge is ploughed back into the electricity market to encourage the growth of renewables.

The Renewables Obligation (RO) was established to encourage all forms of renewable energy, but also designed to bring forward the most cost effective technologies first. It has been very successful in doing this and the government is now proposing extra support through the RO for emerging technologies such as wave and tidal-stream whilst maintaining support for established technologies like onshore wind.

An important feature of the RO is that payment is made in proportion to the electricity produced, so there is no incentive to build a wind farm on an uneconomic site.

Will TV reception be affected?

Wind turbines do have the poten-

tial to affect television reception to those homes using the traditional analogue system (that is now being phased out), and to a much lesser extent, digital TV reception. We will be obliged however to remedy any adverse effect on TV reception that is caused by the wind farm. This is a requirement that would usually form part of a planning condition attached to a planning permission. There are various technical ways of remedying disruption to TV reception, and any work would be carried out at no cost to those affected.

It is worth noting that those with digital, cable or satellite receivers are unlikely to have any problems with their reception.

Why can't all wind farms be sited offshore in the sea?

npower renewables constructed the UK's first major offshore wind farm at North Hoyle (60MW), off the coast of north Wales. We will soon start to construct another offshore wind farm, Rhyl Flats (90MW) nearby, and an application for Gwynt y Mor (up to 750MW) is currently with the government who will make a decision as to whether it will go ahead.

There are a number of other operational offshore wind farms around the UK, and many others at the development phase. The government has recently announced further ambitious targets for the expansion of offshore wind farms in the UK.

For the UK to meet challenging EU and UK renewable energy targets, however we need to make use of as many forms of renewable energy as possible. The UK has 40% of Europe's wind resource and is therefore very well placed to benefit from both onshore and offshore wind farms.


npower renewables Farr Wind Farm, tip height 101m.

Do wind farms kill birds and bats?

Many of our human activities and man made structures pose great dangers to birds and bats. In particular pet cats, electricity pylons and windows cause amongst the highest death rates.

npower renewables has commissioned detailed surveys at Cotton Farm into the existing bird and bat activity around the site. The methodologies used for these studies have been agreed with Natural England (the statutory consultee for ecological issues). These studies help demonstrate potential impacts, and if any impacts are discovered indicate how to mitigate against them. This work commenced at an early period in the development process and has so far shown that the effect of operational wind turbines at the Cotton Farm site on birds and bats will be minimal. The detailed results of the surveys will be presented in the Environmental Statement that will accompany the planning application for the wind farm.

A recent report published by the Royal Society for the Protection of Birds (RSPB)[6] entitled A Climatic Atlas of European Breeding Birds maps potential changes in distribution of all of the continent's regularly occurring nesting birds as a result of climate change. The report states that "we need urgent action to cut greenhouse gas emissions, and redouble our efforts for nature conservation, if we are to avoid calamitous impacts on birds."

References

1 Environmental Change Institute, University of Oxford (2005) Wind Power and the UK Wind Resource.

2 Based on an annual electricity consumption per home of 4700 kWh, which is derived from a total UK domestic electricity consumption of 117.589 terawatt-hours (TWh) and 25.2 million UK households giving 4,666 kWh per year per household. UK energy consumption is as stated for 2004 in The Digest of UK Energy Statistics 2005 The number of UK households is as stated for 2003 in the Mid-year Household Estimates published in 2004 by the Office for National Statistics.

The energy predicted to be generated by the proposal is derived from monitoring wind speeds in the area and correlating this data to wind speeds measured at Met. Office stations. This enables a calculation to be made to estimate the average annual energy production for the site based on 8 turbines each of rated capacity of between 2.5 and 3 MW. The energy capture and equivalent homes figure relating to this project may change as more information is gathered.

3 Milborrow, D. (2005) Quick emissions payback for multi MW wind farms (Windstats) Vol 18, 3.

4 Sustainable Development Commission Report (-11-)

5 Sustainable Development Commission Report (-40-)

6 A Climatic Atlas of European breeding birds (Jan 2008), published as a partnership between Durham University, the RSPB and Lynx in association with the University of Cambridge, BirdLife International, and the European Bird Census Council (EBCC).