

## NORTH YORKSHIRE COUNTY COUNCIL

### TRANSPORT, ECONOMY, ENVIRONMENT OVERVIEW & SCRUTINY

7 November 2012

### RENEWABLE ENERGY POLICY: PROXIMITY OF DWELLINGS TO WINDFARMS

#### Report of the Corporate Director – Business and Environmental Services

#### **1.0 PURPOSE OF REPORT**

- 1.1 Overview & Scrutiny is asked to consider this draft report for Executive, as the basis for agreeing a policy position on Proximity of Dwellings to Windfarms across North Yorkshire.
- 1.2 Overview & Scrutiny has hitherto anticipated that the position may be employed by North Yorkshire districts in policy-making and determination of planning applications.
- 1.3 The report is a response to Executive, 22 May 2012, and contains the next steps that were discussed and agreed at that session.

#### **2.0 BACKGROUND**

2.1 On 22 May 2012 a report on Proximity of Homes to Wind Turbines was taken before Executive, and is appended here for reference. Executive, on 22 May, generally felt that the North Yorkshire position should be based on paragraph 2.1 within that report.

2.2 In addition the 22 May session identified the following as integral next steps:

- That tighter definitions were applied to ‘Homes’ and ‘Wind Turbines’;
- That North Yorkshire District Councils and National Park Authorities be consulted upon the proposed position, since that is the level at which the majority of renewable energy schemes are assessed county-wide<sup>1</sup>;
- That the NYCC Transport, Economy and Environment Overview & Scrutiny Committee have the opportunity to comment upon this matter prior to its return to Executive.

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<sup>1</sup> The County Council has statutory planning functions in respect of Minerals & Waste and Nationally Significant Infrastructure Projects for energy whose generation exceeds 50MW

2.3 It is understood that a presumption against commercial-scale onshore wind energy development exists in respect of National Parks and Areas of Outstanding Natural Beauty, and that this is enshrined within paragraph 115<sup>2</sup> of the *National Planning Policy Framework* (NPPF) as published in its final version by government on 27 March 2012.

### 3.0 DEFINITIONS

#### *'Wind turbines'*

3.1 The discussion for North Yorkshire has always been about 'commercial-scale windfarms'<sup>3</sup> and 'large-scale wind turbines that are generally constructed as part of a windfarm'<sup>4</sup> (hence more than one turbine). This position does not therefore cover 'small-scale' or individual wind turbines.

3.2 National Policy Statements have been devised by government to define policy in respect of energy infrastructure. The *National Policy Statement on Renewable Energy*<sup>5</sup> (NPS EN-3) states at para 2.7.7 that 'commercial-scale wind turbines are large structures and can range from tip heights of 100m up to 150m'.

3.3 As regards capacity NPS EN-3 at para 2.7.3 states that 'onshore wind farm proposals are likely to involve turbines from around two megawatts (MW) of generating capacity and up to three and a half MW, but as technology develops this could increase'.

3.4 A precautionary approach for North Yorkshire would consequently define 'commercial' or 'large-scale' turbines to be deployed on windfarms as having a vertical tip height of at least 100m and a generating capacity of at least 2MW.

#### *'Homes'*

3.5 In planning terms the issue ought most reasonably be about 'residential amenity', i.e. the 'homes' in question must be more or less continuously occupied ('dwellings').

3.6 This definition should most reasonably constitute the basis for the North Yorkshire County Council position.

### 4.0 UPDATING THE EVIDENCE

4.1 The most significant policy and related developments since Executive last considered this matter in May 2012 are summarised in the paragraphs that follow.

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<sup>2</sup> Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

<sup>3</sup> Report for Executive, 22 May 2012, para 3.1

<sup>4</sup> Report for TEEOSC, 4 April 2012, para 5.2

<sup>5</sup> *National Policy Statement for Renewable Energy Infrastructure* (EN-3), DECC (2011)

4.2 In May 2012 the parliamentary Committee on Climate Change issued a report<sup>6</sup> stating how local authorities have an ‘important role’ in supporting power sector decarbonisation through granting planning approval for onshore wind projects and ensuring that these are designed to benefit local communities. Such benefits would include government’s plans for local authorities to retain the business rates income from renewable energy projects (i.e. the planning authority within whose jurisdiction such schemes are located). Government intends to make its *Local Government Finance Bill* an Act so that relevant provisions can be brought into force in April 2013.

4.3 In June 2012 the government resisted parliamentary calls to impose minimum distance requirements between wind turbines and homes<sup>7</sup>. The Planning Minister stated: “Planning policy does not include an exclusion zone between wind turbines and dwellings. Rather, impacts should be assessed on a case-by-case basis taking into account the context, such as the local topography”. The final version of the NPPF continues to be supportive of renewable energy development, including onshore wind<sup>8</sup>.

4.4 In June 2012 Lincolnshire County Council voted<sup>9</sup> that, amongst other criteria, no wind turbine should be erected within 2km of a single residential property, and no windfarms constructed within 10km of a village having more than 10 properties. It is unclear whether this vote has had any significant impact upon relevant district planning policies in Lincolnshire.

4.5 In July 2012 a working group for the Institute of Acoustics (IoA) published a discussion paper<sup>10</sup> to finalise a *Good Practice Guide to the Application of ETSU-R-97* (see also below at 5.5). The authors stated that “it is the working group’s opinion there are difficulties in providing a prescriptive approach to determining fixed limits” (i.e. between turbines and dwellings).

4.6 In September 2012 solicitors acting for energy firm RWE npower renewables wrote to Milton Keynes Council to warn that the company may commence legal proceedings if the Council refuses to withdraw a new planning document on wind energy. Milton Keynes adopted a supplementary planning document (SPD) in July relating to MSD<sup>11</sup>. RWE npower renewables state that the coalition government has rejected the idea of a separation distance between turbines and residential dwellings for England, and that there is no minimum separation distance in English planning law or guidance. The firm could also commence judicial review proceedings against the Council if the document is not withdrawn<sup>12</sup>. It is not known whether this will have any effect upon the SPD.

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<sup>6</sup> *How Local Authorities can Reduce Emissions and Manage Climate Risk*, Committee on Climate Change, May 2012

<sup>7</sup> *Commons Hansard*, 18 June 2012: column 695W

<sup>8</sup> *National Planning Policy Framework*, Communities & Local Government (March 2012) paragraphs 96-98

<sup>9</sup> *Lincolnshire County Council Executive Meeting*, 6 June 2012

<sup>10</sup> <http://www.ioa.org.uk/pdf/ioa-discussion-document-july-2012.pdf> (para 3.3.8)

<sup>11</sup> For turbines of 100m the minimum distance requirement is 1000m ; at greater than 100m the policy is less clear

<sup>12</sup> <http://www.planningresource.co.uk/news/1149243/energy-firm-warns-councils-wind-turbine-policy>

## *District & National Park considerations*

4.7 In the autumn of 2012 views were duly sought from the North Yorkshire Districts and National Parks<sup>13</sup>. In synthesis it was held that the proposed NYCC position:

- would be in conflict with the NPPF and could not be recommended as an approach to Members for inclusion in development plan documents;
- conflicted with local policy which deals with such applications on a case-by-case basis;
- is already contained within the EIA process for identifying impacts in respect of individual applications;
- would also replicate relevant SPDs or draft SPDs that local authorities already have;
- would have little weight and raise public expectations where there is local opposition to such developments; and
- could risk leaving no sites available across North Yorkshire for such development.

## **5.0 KEY DETERMINANTS: NOISE AND SHADOW FLICKER - SUMMARY**

5.1 Whilst draft options for North Yorkshire have hitherto encompassed noise, shadow flicker and visual impacts it is in effect only the first two of these – noise and shadow flicker – that are sufficiently objective as quantifiable parameters to be included within this position.

5.2 It is deemed that visual impacts are too subjective to be reasonably covered by a NYCC position.

### *Noise*

5.3 Noise impacts from wind turbines are typically related to Amplitude Modulation (AM) and low-frequency noise ('infrasound').

5.4 Those living near windfarms claim that the noise experienced disrupts their sleep, leading to stress and depression. The *British Medical Journal* published an article on wind turbine noise<sup>14</sup>, which stated: "shortly after wind turbines began to be erected close to housing, complaints emerged of adverse effects on health. Sleep disturbance was the main complaint. Such reports have been dismissed as being subjective and anecdotal, but experts contend that the quantity, consistency, and ubiquity of the complaints constitute evidence of a strong link between wind turbine noise, ill health, and disruption of sleep".

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<sup>13</sup> *North Yorkshire Development Plans Forum*, 7 September 2012 and *North Yorkshire Planning Officers' Group*, 21 September 2012 (paper circulated in spite of meeting being cancelled)

<sup>14</sup> *Wind Turbine Noise*, Hanning, Christopher and Evans, Alun in *British Medical Journal* (8 March 2012)

5.5 ETSU-R-97 guidelines, *The Assessment and Rating of Noise from Windfarms* (1996) - current best practice - set out the noise levels within which a turbine must operate in order to protect public health. The IOA has been leading a working group on establishing Good Practice Guidance to accompany the 1996 guidelines (see 4.6 above) to be published in 2013.

5.6 The concern with blanket advisory guidance – e.g. a 2km separation distance – is that it would reduce the capacity for energy generation and cover areas where communities do not experience problems with noise. Where the issue is evident planning conditions controlling noise can be attached to consent, and permission can be refused if it is felt that noise will be a problem.

5.7 It is also important that the cumulative effect of all wind turbines in an area be taken into account in decision-making. This is especially important when windfarms are being planned in areas that already have turbines in operation.

#### *Shadow flicker*

5.8 Shadow flicker is especially associated with the winter months when the sun transits low in the sky. The means of determining the impact on a locality requires specific site orientation and turbine technology calculations that need to be made on a site-by-site basis. Shadow flicker can have an impact within 130 degrees either side of north and may occur within ten times the rotor diameter of a turbine.

5.9 Modern turbines tend to have rotor diameters that average 70-100m, which would imply a partial minimum separation distance for flicker of 700-1000m – but only in that zone between 230 and 130 degrees of north, going clockwise (the ‘potential shadow flicker zone’).

## **6.0 PROPOSAL**

6.1 With reference to the above Overview & Scrutiny is requested to consider and comment upon the following as the basis for a position across the county to be put as soon as possible before Executive:

The North Yorkshire County Council policy position is predicated upon a two-kilometre minimum separation distance (MSD) between dwellings and windfarms which, to be consistent with national policy, nonetheless places the onus upon the scheme proposer to provide evidenced reasons for reducing MSD. The fundamental criteria within this position therefore are:

- That the scheme proposer, on a case-by-case basis, prove that MSD between dwellings and a windfarm may be reduced to a distance less than 2 kilometres;
- That reduced MSD nevertheless assures the integrity of residential amenity and public health;
- That the primary determinants of MSD be shadow flicker and noise, which are objective factors requiring independent assessment;

- That shadow flicker, unless negated by local topography, is known to be determinable according to turbine rotor-blade diameter;
- That noise has to be determined locally owing to place-specific, generation, and atmospheric variables.

6.2 It is important to remember that, as pointed out by North Yorkshire districts (4.7 above) the proposed position would have little or no weight in the planning process.

6.3 A further option for the NYCC policy position could be that any such planning application that caused County Council concern – on grounds relevant to County Council business - would merit a full and robust response, notably by the service(s) concerned. Such a proposal would obviously need to be discussed more deeply with potentially affected departments.

## **7.0 RECOMMENDATION**

7.1 Overview & Scrutiny is asked to comment on this draft report to Executive, as a basis for agreeing a position on Proximity of Dwellings to Windfarms in North Yorkshire.

DAVID BOWE

Corporate Director – Business and Environmental Services

Author of Report: Ray Bryant

### Background Documents:

- Report to NYCC Executive 22 May 2012 (with accompanying report 4 April 2012) *Proximity of Homes to Wind Turbines*
- *National Planning Policy Framework* (CLG, March 2012) – for reference

**NORTH YORKSHIRE COUNTY COUNCIL****EXECUTIVE****22 MAY 2012****RENEWABLE ENERGY POLICY: PROXIMITY OF HOMES TO WIND TURBINES****Report of the Corporate Director – Business and Environmental Services****1.0 PURPOSE OF REPORT**

- 1.1 The following sets out modifications to the accompanying report, as made by Transport Economy & Environment Overview & Scrutiny Committee (TEEOSC) on 4 April 2012.
- 1.2 Executive members are asked to consider both this and the accompanying report, and agree a basis for advisory guidance on Proximity of Homes to Wind Turbines across North Yorkshire.

**2.0 BACKGROUND**

- 2.1 On 4 April 2012 a report on Proximity of Homes to Wind Turbines was taken before TEEOSC. The report concluded with two options that could constitute advisory guidance across North Yorkshire for the Committee to consider. These options were:
  - A. A flexible but precautionary approach stating that developers, on a case-by-case basis, must provide thorough assessments that justify a minimum separation distance in respect of noise, shadow flicker and visual impacts, i.e. the distance determined by whichever criterion requires the greatest separation, until or unless relevant national policy, guidance or legislation is modified.
  - B. An approach based on the fixed 2-kilometre separation distance sought by Overview & Scrutiny in November 2011 that, to be in line with national policy, places a requirement upon the developer to provide evidenced reasons for reduced separation in respect of noise, shadow flicker and visual impacts, whilst nevertheless assuring the integrity of residential amenity.

### **3.0 AMENDMENT**

3.1 TEEOSC amended officer recommendations with the following resolution:

“The County Council considers that there should be a presumption against commercial-scale wind farms being developed within a two kilometre distance of residential properties, and that National Parks, Areas of Outstanding Natural Beauty and other protected landscapes, and their settings, are inappropriate for commercial scale wind turbine development given their intrinsic beauty and character.”

### **4.0 ADDITIONAL DEVELOPMENT**

4.1 In something of a change in UK strategy, on 15 April 2012 Greg Barker, Minister of State for Energy & Climate Change, gave an interview to *The Sunday Times* in which he stated that there would be no further expansion in the number of onshore wind turbines beyond those already in the pipeline (i.e. either in planning or already consented).

### **5.0 PROPOSAL**

5.1 With reference to the above Amendment at ‘3’ Executive is requested to agree a basis for advisory guidance on Proximity of Homes to Wind Turbines across the county.

### **6.0 RECOMMENDATION(S)**

6.1 Executive is asked to consider the TEEOSC Amendment along with the accompanying report and agree advisory guidance on Proximity of Homes to Wind Turbines in North Yorkshire in line with 3.1 above.

DAVID BOWE  
Corporate Director – Business and Environmental Services

Author of Report: Ray Bryant

Background Documents: None



## **NORTH YORKSHIRE COUNTY COUNCIL**

### **TRANSPORT, ECONOMY & ENVIRONMENT OVERVIEW & SCRUTINY**

**4 APRIL 2012**

#### **RENEWABLE ENERGY POLICY: PROXIMITY OF HOMES TO WIND TURBINES**

##### **1.0 PURPOSE OF REPORT**

- 1.1 To update and propose a draft position for Council to consider on the matter of Proximity of Homes to Wind Turbines in North Yorkshire, and seek an Overview and Scrutiny recommendation in respect of the options presented herein.

##### **2.0 BACKGROUND**

- 2.1 The issue of Minimum Separation Distance (MSD) between dwelling houses and commercial wind turbines was raised and discussed at the NYCC Transport, Economy & Environment Scrutiny and Overview Committee (TEEOSC) of 23 November 2011.
- 2.2 Members of the public and representatives from environmental lobbies were also present at the session, and have made their positions known both verbally and through formal written statements. NYCC has duly engaged with these concerns.
- 2.3 The consensus from the session was to seek to secure a two-kilometre MSD within North Yorkshire. Further evidence-based research into the matter was nevertheless requested.
- 2.4 In a letter to Councillor Richardson on the matter in January 2012 corporate director David Bowe explained that officers would prepare a draft policy proposal on the matter. The report below addresses this, synthesising both existing and new evidence, and setting out what it believes to be a realistic policy proposal.

##### **3.0 CONTEXT**

- 3.1 The UK government actively promotes and supports renewable energy developments. As part of EU-wide action to increase the use of renewable energy, the government has committed to generating 15% of energy from renewable sources by 2020 (2009 European Renewable Energy Directive). This will contribute towards the UK's 2008 Climate Change Act target to reduce greenhouse gas emissions by 34%, compared to 1990 levels by 2020, and 80% by 2050.

- 3.2 Renewable energy production from wind turbines will play an important role in contributing towards achieving these targets. National policy on renewable energy development takes a positive stance and makes clear that local authorities must take a corresponding approach towards renewable and low-carbon energy (RLCE) developments.
- 3.3 The Department of Energy and Climate Change (DECC) website underlines that the UK needs to move from finite, high-carbon fossil fuels to clean, secure energy<sup>1</sup>. “No individual technology”, it states, “will provide the silver bullet – our energy mix will have to become increasingly diverse. As part of that mix, onshore wind will have an important role to play”.
- 3.4 Onshore wind is one of the more cost-effective and established renewable technologies. It has become economically more attractive on a global scale, and by 2008 the total installed global wind energy capacity was over 120GW. As part of a market forecast carried out for Scottish Enterprise<sup>2</sup>, consultants AEA conducted research with key stakeholders in the wind market which confirmed that the combined UK and Scottish market is the number one wind market in Europe and represents a key economic opportunity.
- 3.5 Moreover, according to research from Bloomberg New Energy Finance<sup>3</sup>, the cost of electricity from onshore wind turbines will drop 12% in the next five years thanks to a mix of lower-cost equipment and gains in output efficiency. The best wind farms in the world, Bloomberg states, already produce power as economically as coal, gas and nuclear generators.
- 3.6 Progress made in efficiency and relative cost has however been accompanied by a hardening of public attitudes against windfarms in many parts of the country. It is possible that the UK administration may alter aspects of its approach regarding the scale of onshore wind energy likely to be realised - with potentially a corresponding expectation placed on offshore wind that it become a more prominent component within the energy mix. Nonetheless at the time of issue of this paper there has been no explicit UK policy shift that excludes onshore windfarms from the future generation portfolio.
- 3.7 NYCC therefore has an important balance to strike when releasing any policy position into the public domain. Advice needs to express a realistic and credible view when faced with responding: a) as statutory consultee on energy-related nationally strategic infrastructure projects (NSIPs)<sup>4</sup> as outlined in the National Policy Statements on Energy, and b) to consultations on specific planning applications as necessary. NYCC is being consulted on non-NSIP energy generation proposals, especially windfarms, around the county and needs to establish a position that is both reasonable and consistent should it need to attend a relevant inquiry.

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<sup>1</sup> [http://www.decc.gov.uk/en/content/cms/meeting\\_energy/wind/onshore/onshore.aspx](http://www.decc.gov.uk/en/content/cms/meeting_energy/wind/onshore/onshore.aspx)

<sup>2</sup> *Energy Industry Market Forecasts 2009-2014: The Wind Market*, Scottish Enterprise (2010)

<sup>3</sup> *Onshore Wind Energy to Reach Parity with Fossil-fuel Electricity by 2016*, Bloomberg New Energy Finance (10 November 2011)

<sup>4</sup> NSIP for energy is defined as being where capacity will exceed 50MW

## 4.0 THE ISSUE

- 4.1 Health and safety concerns about noise impacts and shadow flicker are clearly at the heart of the debate around dwellings and proximity to commercial wind turbines, especially since the effects of the latter – proven or otherwise – appear to extend to greater distances than those that may be determined purely on a visual amenity basis.
- 4.2 The Local Government Improvement and Development website (formally IDeA) has some information on wind turbines. There is a section<sup>5</sup> under residential properties on approximate setback distances, which advocates:

*A setback distance of at least 600-800 metres from residential properties for large wind turbines, which may be reduced for smaller projects.*

- 4.3 Scottish national policy (2010) refers to a separation distance of up to 2 kilometres<sup>6</sup>. It is largely this that the NYCC TEEOSC has based its own preferences on. However, it is important to note that this is not a fixed minimum separation distance, nor is it a distance that is enforced in practice. The distance is simply an initial indication for energy companies and is a recommended buffer between areas of search and the edge of settlements.
- 4.4 A petition was placed before the Scottish Parliament in 2010<sup>7</sup>, seeking to have the 2km ruling extended to all turbines versus residential properties. The Scottish Executive provided reasons why it will not guarantee the application of a minimum separation distance of 2km between a wind farm development and any dwelling:

*Planning Advice Note 45 makes noise measurement an integral part of the environmental impact assessment process for wind farm applications, and there is academic evidence that no health effects result from the sound that might be generated.*

- 4.5 In Wales a 'typical separation distance' of 500m is recommended<sup>8</sup>. The document however states that the advice should be deemed to be flexible. Carmarthenshire has opted for 1.5km<sup>9</sup>. This draft position needs to be agreed by the Welsh Assembly.

- 4.6 Northern Ireland's renewable energy policy RE1 (2009)<sup>10</sup> states:

*For windfarm development a separation distance of 10 times rotor diameter to occupied property, with a minimum distance not less than 500 metres, will generally apply.*

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<sup>5</sup> <http://www.idea.gov.uk/idk/core/page.do?pageId=25290366#contents-3>

<sup>6</sup> *Scottish Planning Policy*, Scottish Executive (2010)

<sup>7</sup> *Wind Farm Developments (PE1328)*, Scottish Parliament (2010)

<sup>8</sup> *Technical Advice Note 8 – Planning for Renewable Energy*, Welsh Assembly (2005)

<sup>9</sup> *Carmarthenshire Local Development Plan* (2011)

<sup>10</sup> *Planning Policy Statement 18 Renewable Energy*, Department of the Environment (2009)

- 4.7 In England the government has hitherto rejected the idea of a separation distance (House of Commons Briefing Note SN/SC/5221, 2011). A summary of established MSD from around the UK at February 2012 is provided at the end of Section 4 (below).

### **Noise Impacts**

- 4.8 Noise is one of the issues considered in assessing applications for windfarms, and one which is significant as regards the impacts of a proposal on residential amenity. Such impacts are typically related to Amplitude Modulation (AM) and low-frequency noise ('infrasound'). The potential for AM noise can be a particular cause of concern for many residents close to the site of a proposed windfarm. Excess wind shear is the primary cause, sometimes referred to as the 'thump' or 'swish' noise made by the blades of the turbine.
- 4.9 PPS 22 - planning policy guidance on renewable energy developments, due to be scrapped - states that *The Assessment and Rating of Noise from Windfarms* 1997 report by the Energy Technology Support Unit ('ETSU-R-97') for the Department of Trade and Industry, should be used to assess and rate noise from wind energy development. Some commentators argue however that ETSU-R-97 has been overtaken by the speed with which wind energy developments have accelerated. One of the major problems with AM noise is that it is not fully understood and cannot therefore be predicted. A 2007 report into this commissioned by DEFRA, BERR and CLG<sup>11</sup>, which updated a 2006 report by the Hayes McKenzie Partnership, states that the incidence of AM and the number of people affected is currently small and that:

*Since AM cannot be fully predicted at present, and its causes are not fully understood we consider that it might be prudent to carry out further research to improve understanding in this area.*

- 4.10 Although the government has consistently defended the 1997 guidelines, a 2011 DECC commissioned study *Analysis of How Noise Impacts are Considered in the Determination of Wind Farm Planning Applications* also concluded that updated best practice guidance on noise was required. Specifically related to AM, the document states that:

*There is currently no requirement in ETSU-R-97 to include any correction or penalty for any modulation in the noise [...] This position would need to be re-stated, or otherwise addressed in any best practice guidance, in line with current research and guidance.*

- 4.11 In the context of these opinions it would be appropriate for any reviewed best practice guidance to confirm a reasonable and robust way of dealing with wind shear issues since this is fundamental to the assessment procedure. Infrasound is considered further (below) in this section. In the meantime the County Council might deem it sensible for a fairly precautionary approach to be taken to windfarm planning applications.

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<sup>11</sup> *Research into Aerodynamic Modulation of Wind Turbine Noise: final report*, University of Salford (2007)

## Shadow Flicker

- 4.12 Shadow flicker is especially associated with the winter months when the sun transits low in the sky. The means of determining the impact on a locality requires specific site orientation and turbine technology calculations that need to be made on a site-by-site basis. Shadow flicker can have an impact within 130 degrees either side of north and may occur within ten times the rotor diameter of a turbine.
- 4.13 The Companion Guide to PPS22 enshrined these parameters in national policy, stating that effects from shadow flicker are negligible at a distance beyond the ten times multiple. The guidance continues to be accepted as broadly reliable<sup>12</sup>. Owing to low winter sun-angle shadow flicker will nevertheless be more critical in the north of Scotland than it will in the south of England. North Yorkshire has a central location in the middle of Britain so here the guidance should be as accurate as it can be anywhere in the UK.
- 4.14 Modern turbines tend to have rotor diameters that average 70-100m, which would imply a partial MSD for flicker of 700-1000m – but only in that zone between 230 and 130 degrees of north, going clockwise (the ‘potential shadow flicker zone’).
- 4.15 On the specifics of setting MSD between turbines and homes, a number of Scottish authorities (see table below) have begun to coalesce around the ten times multiple, believing this to be sufficient to deal additionally with potential noise effects.

## Updating the Evidence

- 4.16 Mrs Emmett of the Craven Branch of the Campaign to Protect Rural England (CPRE) cites from correspondence with South Cambridgeshire District Council that it will undertake to include in its ongoing Local Development Framework (LDF) review that:

*A minimum distance of 2 kilometres between a dwelling and a turbine should be set to protect residents from disturbance and visual impact. If the applicant can prove that this is not the case a shorter distance would be considered.*

- 4.17 In further correspondence, both Dr Ferguson of ‘Stop Woodlane Windfarm’ and Mr Partington of the ‘Scientific Alliance’ make useful reference to some Danish research carried out in 2011. Denmark has introduced guidelines for wind turbine noise that reduces previous allowable levels; noise must now remain below limits both indoors and outdoors, and the guidance includes audible noise as well as inaudible noise such as infrasound<sup>13</sup>.

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<sup>12</sup> Update of UK Shadow Flicker Evidence Base (DECC, 2011)

<sup>13</sup> Miljøministeriet / Environment Ministry (2011)

[http://www.mst.dk/English/Noise/wind\\_turbine\\_noise/low\\_frequency\\_noise\\_from\\_wind\\_turbines/low\\_frequency\\_noise\\_from\\_wind\\_turbines\\_FAQ.htm](http://www.mst.dk/English/Noise/wind_turbine_noise/low_frequency_noise_from_wind_turbines/low_frequency_noise_from_wind_turbines_FAQ.htm)

- 4.18 Detailed analysis by the Danish government into several projects found that infrasound is emitted by certain types of serial-produced wind turbines in specific situations. The analysis also states that infrasound is no more dangerous than other forms of noise. When audible, infrasound is described as annoying. Inaudible infrasound, the analysis states, does not affect health.
- 4.19 The study reveals that large wind turbines emit more low-frequency noise than small ones, and should therefore not be located as close to properties. Importantly, it continues:

*There is no clear correlation between the size of the wind turbine and the level of low-frequency noise it emits. This depends more on construction type than size.*

- 4.20 The Danish analysis would once again seem to place the onus upon the applicant to ensure that design is right, given the specificities of the project in question.

#### **Informal Consultation with North Yorkshire Districts**

- 4.21 In February 2012 NYCC carried out an informal consultation with District planning departments on this matter. The consensus was that MSD is difficult to identify accurately, and should be the minimum that is feasible to protect residential amenity. This should be defined on a case-by-case basis with the responsibility for proving safe distance being with the scheme promoter.

#### **Prominent Case-law**

- 4.22 There have been two instances involving High Court judgments that appear to be prominent in terms of relevant case-law, which have also been raised by Dr Ferguson in correspondence to NYCC.
- 4.23 At Den Brook Valley in Devon a Public Inquiry was required. It issued a limit on Amplitude Modulation that was subsequently ratified by High Court decision in 2011<sup>14</sup>. The net effect of the outcome concerns the planning conditions agreed for consent of the 9-turbine windfarm. The inspector found that the possibility of AM could not be ruled out, and that if present it could cause sleep disturbance. For precautionary reasons he therefore imposed two conditions: Condition 20 defined the characteristics of 'greater than expected AM'. Condition 21 prohibited the development from generating electricity until the local authority had approved a complaint-driven scheme requiring measurement of noise emissions, its stated purpose being 'to evaluate compliance with condition 20'.
- 4.24 This decision sets a legal precedent for future wind farm planning consents insofar as it confirms that appropriate planning conditions may be considered to provide adequate protection from AM noise for wind farm neighbours. Due to the current uncertainty over the prediction of excess AM noise it is likely that more of this type of condition will be imposed when wind farms are granted planning permission.

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<sup>14</sup> *Briefing Note*, Cass Allen Associates (20 July 2011)

4.25 The Lincolnshire case of *Davis v Tinsley*, which was about AM-related problems and went to the High Court in 2011, would have been a landmark case in private nuisance proceedings - had it gone all the way to judgment. As it happened, the parties settled confidentially<sup>15</sup> meaning that there was no admission of liability on the developer's part.

### Parliamentary Bills

4.26 The House of Lords is due to convene to consider Committee Stage findings into the *Wind Turbines – Minimum Distances from Residential Premises Bill*. Following its Second Reading in June 2011 the Bill is currently predicated on proposals that link distance with turbine height i.e. from the ground to the end of the tip blade at its highest point:

- From 25m and not exceeding 50m 1000m
- From 50m and not exceeding 100m 1500m
- From 100m and not exceeding 150m 2000m
- Greater than 150m 3000m

4.27 A further, House of Commons initiative – *Onshore Wind Turbines (Proximity of Habitation) Bill* – reaches its Second Reading on 30 March 2012, and aims to stipulate recommended best practice set-back distance, expressed as a multiple of the turbine rotor diameter - indicatively the ten times multiple. This clearly reflects some of the recent Scottish decision-making, although the Bill only makes reference to its applicability in neighbourhood planning.

### Summary of Guidance on MSD (February 2012)

<i>Location / authority</i>	<i>Ruling</i>	<i>Policy status / other remarks</i>
Welsh Assembly	500m	<b>Adopted</b> ; flexible approach however suggested
Torridge DC	600m	<b>Adopted 'without status'</b> ; noise / amenity
Cherwell DC	800m	<b>Adopted 'without status'</b> ; noise / amenity
Milton Keynes Council	800m	Noise / safety, draft local plan review
Moray Council	Variable	10 x rotor diameter outwith Preferred Search Areas (draft supplementary guidance)
Northern Ireland	Variable	<b>Adopted</b> ; 10 x rotor diameter (or 500m minimum)
Aberdeenshire / Highland Councils	Variable	10 x rotor diameter (draft guidance in each case)
Carmarthenshire CC	1.5km	Draft local plan recommendation
Proposed Lords Bill	1.5km 2km	Turbines not exceeding 100m Turbines 100m-150m high
Scottish Executive	2km	<b>Adopted</b> but only refers to strategic search areas
Sth Cambridgeshire DC	2km	Applicant to prove reduced MSD in LDF review

<sup>15</sup> *Couple Settle with Windfarm Operators over 'Unbearable Hum'*, The Daily Telegraph (30 November 2011)

## Minimum Separation Distance - Conclusions

- 4.28 As was the case in November 2011 at the time of the TEEOSC the case for making a specific recommendation in relation to a minimum separation distance for noise and shadow flicker impacts remains difficult. In many respects the most reliable adopted policy has been agreed in the devolved administrations of Wales and Northern Ireland. The guidelines on MSD from Ulster are the most recent (2009).
- 4.29 Having reviewed wind energy guidance produced by other English authorities, Cherwell and Torridge District Councils and Milton Keynes Council are the only ones that appear to have attempted to introduce specified MSD to protect residential amenity. Two of the documents have been ‘adopted without status’, and all stress that they do not hold any formal planning status. It is made very clear that these distances are encouraged rather than enforced and each recognises that it would be contrary to national policy to implement the specified distances rigidly. Other authorities with SPDs or guidance covering wind turbine developments do not specify separation distances and make clear that, in line with national policy, each application must be assessed on a case-by-case basis, with separation distances likely to be different for each development.
- 4.30 Should the County Council wish to be equipped with advice on a minimum separation distance, the most reasonable updated evidence-based recommendations at this point in time can be summarised thus:

<i>Impact type</i>	<i>Minimum separation distance</i>
Visual amenity	At least 400 metres
AM noise / infrasound	Dependent upon local topography and turbine type used
Shadow flicker	10 x rotor diameter, 230 to 130 degrees north of turbines

- 4.31 Drawing the evidence together it is clear that for commercial-scale applications either noise or shadow flicker would constitute the maximum buffer requirement (whichever of the two were greater). Further work to identify those turbine construction types highlighted by the Danish Environment Ministry as carrying significant infrasound impacts would most likely be useful.
- 4.32 For this reason, from a professional standpoint, it is believed that the matter of proximity of homes to wind turbines be best established on a case-by-case basis, with the onus on reasonable and proven proximity being with the developer, and taking account of other potential effects relating amongst other things to biodiversity, heritage and cumulative impact. Of great assistance in the matter would be the outcome of any work by DECC to update ETSU-R-97. The DECC website<sup>16</sup> states that ‘the government is in discussions [...] to lead a working group on establishing best practice guidance’.

<sup>16</sup> [http://www.decc.gov.uk/en/content/cms/meeting\\_energy/wind/onshore/comms\\_planning/noise/noise.aspx](http://www.decc.gov.uk/en/content/cms/meeting_energy/wind/onshore/comms_planning/noise/noise.aspx)



## Summary of Key Issues

4.33 The headline issues that arise from the above discussion are the following:

- I. There is general government support for the development of onshore wind energy generation infrastructure, as part of a diversified and integrated portfolio of sources that reduces both dependence upon fossil fuels and the political risks associated with the global trading of essential commodities.
- II. The UK is Europe's single biggest wind energy market, with key opportunities being made available to the sector at a time when the UK economy is struggling.
- III. In business and efficiency terms, and independent of subsidies etc, onshore wind generation is expected to reach full grid parity vis-à-vis conventional energy sources within the next five years.
- IV. There are technical issues with large-scale wind turbines that can impact upon residential amenity, two of which have the potential to lead to separation distances greater than those hitherto recommended within existing ETSU-R-97 guidance:
  - Shadow flicker, in respect of which a distancing principle of ten times rotor blade diameter is widely agreed as being appropriate;
  - Noise disturbance (amplitude modulation and infrasound), in respect of which residential amenity must be assessed on a case-by-case basis in accordance with local conditions.
- V. Government is coming under pressure from numerous parts of the UK to be rather more circumspect in its support for onshore windfarms.
- VI. A range of policy approaches on minimum separation distance have been formally adopted around the UK: none of these appears to provide North Yorkshire with exactly the right solution at this point in time.

## 5.0 **DRAFT PROPOSALS ON PROXIMITY OF HOMES TO WIND TURBINES**

- 5.1 In the same way that, in terms of minimising impacts, Scottish strategic policy aims to direct wind farms to the most appropriate locations, it is deemed that the most sensible way of introducing an approach to protect residential amenity - without overly restricting the development of renewable energy - would be to encourage developers to identify sites in areas furthest away from settlements. An Amplitude Modulation noise condition could be applied upon the granting of planning permission, adding weight to the need for energy companies to choose sites furthest away from dwellings.

- 5.2 It is important to remember that, as non-determining planning authority, any NYCC policy proposal will have a limited effect, and cannot provide a comprehensive guide on all of the issues to be considered in determining applications for wind turbine development. This proposal only relates to large-scale wind turbines that are generally constructed as part of a windfarm; it does not cover small-scale individual wind turbines.
- 5.3 Two policy options on Proximity of Homes to (large-scale) Wind Turbines in North Yorkshire appear to be realistic, of the type and nature that might credibly influence a planning inspector's opinion. It is advised that maintaining some flexibility in the County Council's approach may well prove useful should UK policy specifically on onshore wind be altered at some point in the future. Options may be summarised as follows:
- A. A flexible but precautionary approach stating that developers, on a case-by-case basis, must provide thorough assessments that justify a minimum separation distance in respect of noise, shadow flicker and visual impacts, i.e. the distance determined by whichever criterion requires the greatest separation, until or unless relevant national policy, guidance or legislation is modified.
  - B. An approach based on the fixed 2-kilometre separation distance sought by Overview & Scrutiny in November 2011 that, to be in line with national policy, places a requirement upon the developer to provide evidenced reasons for reduced separation in respect of noise, shadow flicker and visual impacts, whilst nevertheless assuring the integrity of residential amenity.

## **6.0 RECOMMENDATION**

- 6.1 That from draft proposals 'A' and 'B' on Proximity of Homes to Wind Turbines a preferred option be identified to recommend for Executive consideration and adoption as County Council advisory guidance.

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Background Documents: None