

PLANNING APPLICATION

by

WHIRLWIND RENEWABLES LLP

for

**The erection of six wind turbines with a maximum tip height of 110m, and
the construction of associated site access tracks, crane pads, electrical
control building and temporary construction compound**

at

Thackson's Well,

Sewstern Lane, Long Bennington, Newark, Lincolnshire, NG23 5EX

South Kesteven District Council

REFERENCE: S15/0862

Belvoir Locals Oppose Turbines



Supplementary Document

Wind Turbines: Noise & Health

June 2015

Wind Turbines - Noise and Health

Introduction

When we were first caught up with Thackson's Well in 2007 many bold claims were made by that developer regarding the lack of noise from wind turbines and locals were sceptical. We had reason to be sceptical. The 6th Wind Turbine Noise conference has just been held (Glasgow 2015) which continued the process of examining issues with wind turbine noise; issues which allegedly did not exist in 2007.

We are now faced with a similar situation with a new developer, with barely a refreshed script referring to flawed studies and old assertions of turbine noise masked by wind in trees.

We remain convinced there are elements within the emissions from wind turbines, which are adverse and which the ES and current system fails to consider properly.

This document (in summary and main script) shows why it is time to put a halt to the denials proffered by the industry. These need to be replaced with a concerted effort of problem solving before all confidence is lost in a system which, until now, has ignored those whose lives have been made worse. It is no longer enough to hide behind meaningless rhetoric and spin and evidence supports this.

Summary

Numbers quoted in squared brackets relate to the numbered "Noise and Health Main Script" below this summary/conclusion.

1) Removal of "sleep disturbance" from what became a policy document. This is quoted in the ES and elsewhere as evidence "there are no health impacts" where as it did no such thing. (A82 ref.) [42]

A DTI report by the Hayes McKenzie Partnership (HMP) published in 2006 investigated low frequency noise at three UK wind farms (9). The published conclusions were that all was well with ETSU-R-97. However, draft versions of the report (10-12) came to light as a result of Freedom of Information requests. They show that HMP had **recommended a reduction of the ETSU-R-97 permitted night time limits**. These recommendations, and **references to health concerns, were removed from the final version of the report**. No scientific explanation for their removal seems to have been offered. (INDUSTRIAL WIND TURBINES: The health case for increased setbacks. Dr CD Hanning. BSc, MB, BS, FRCA, MD Honorary Consultant in Sleep Medicine, University Hospitals of Leicester. Prepared at the request of SGFWF for submission to Wiltshire Council Planning and Development.)

2) Compliance to UK standards does not mean no harm, so "Duty of Care" not upheld. Northern Ireland Environment Committee calls for immediate update of ETSU. [2-7,29-32,47-70]

3) At least one visual, non-audible pathway for wind turbine emissions to reach and affect some people. Study which proves that large sections of ES are wrong. [14-26]

4) (A32 ref.) admits health impact as possibility, but buffer between homes and turbines not increased accordingly. [27]

5) (A73 ref.) This additional reassurance followed the voicing of concerns by some interested parties that, because infrasound and very low frequency vibrations could be measured from wind farms, then it must follow that these were a potential hazard and source

of annoyance. In fact what those concerned observers failed to account for is that highly sensitive electronic measuring equipment designed solely to detect such infrasonic sounds and vibrations is orders of magnitude more sensitive than even the most sensitive human. Thus, whilst such measurement systems may be able to detect such low level phenomena, the same stimuli can have no effect on humans. In the light of this, Leventhall issued an open statement:

I can state quite categorically that there is no significant infrasound from current designs of wind turbines. To say that there is an infrasound problem is one of the hares which objectors to wind farms like to run. There will not be any effects from infrasound from the turbines. (Cooper Cape Bridgewater Study evidence shows assertion to be false)

6) Vestas letter to minister showing candidate 3MW turbine would not comply with stricter low frequency Danish noise standard, if introduced. [77-79]

7) (A59 ref.) . These turbines were of the 'downwind' type, 'downwind' referring here to the fact that the rotor blades were located downwind of the turbine tower rather than upwind of it, as is the case for current machines. [10-12]

Nov 1987 Kelley: follow-up paper at the Windpower '87 Conference & Exposition in San Francisco, titled "[A Proposed Metric for Assessing the Potential of Community Annoyance from Wind Turbine Low-Frequency Noise Emissions](#)." US Department of Energy, Contract No. DE-AC02-83CH10093.

*We electronically simulated three interior environments resulting from low-frequency acoustical loads radiated from **both individual turbines and groups of upwind and downwind turbines....***

Experience with wind turbines has shown that it is possible ... for low-frequency acoustic noise radiated from the turbine rotor to interact with residential structures of nearby communities and annoy the occupants....

The modern wind turbine radiates its peak sound power (energy) in the very low frequency range, typically between 1 and 10 Hz [i.e., infrasound]. ...

*Our experience with the low-frequency noise emissions from a single, 2 MW MOD-1 wind turbine demonstrated that ... it was possible to cause annoyance within homes in the surrounding community with relatively low levels of LF-range [low frequency range] acoustic noise. An extensive investigation of the MOD-1 situation revealed that this annoyance was the result of a coupling of the turbine's impulsive low-frequency acoustic energy into the structures of some of the surrounding homes. **This often created an annoyance environment that was frequently confined to within the home itself.***

*.....These results, limited as they are, seem to confirm(1) people do indeed react to a low frequency noise environment and (2) **A-weighted measurements are not an adequate indicator of annoyance** when low frequencies are dominant.*

Conclusion

There is enough knowledge available to say this site, with 6 wind turbines of this output and scale, at the proposed setbacks will cause harm to a significant percentage of the neighbours, including sleep disturbance and the consequential health deficits.

The ES makes numerous references to the 2003 Defra document by Leventhall which indicates they regard it as valid evidence (It is a review and not original research). It becomes more interesting to see what parts of the Defra paper the ES has omitted:

This example shows the difficulty of attenuation for domestic properties;

The physics of low frequency noise...Control: Infrasound is difficult to stop or absorb. Attenuation by an enclosure requires extremely heavy walls, whilst absorption requires a thickness of absorbing material up to about a quarter wavelength thick, which could be several metres.

And this, which mirrors actual experiences of wind turbine neighbours when trying to resolve their complaints;

....the very real low frequency noise difficulties faced in a number of environmental noise problems, where low frequency noise occurs at low levels, often in the region of an individual's hearing threshold. The noise, typically classed as "not a Statutory Nuisance", causes immense suffering to those who are unfortunate to be sensitive to low frequency noise and who plead for recognition of their circumstances.

And this quote which agrees with the 1980's NASA wind turbine research stating dbA does not provide an adequate noise test;

Attempts to assess low frequency noise by conventional wide-band noise methods often fail, so illustrating the inadequacy of these methods for low frequencies. In particular, the regulatory dominance of A-weighted levels, leads to dismissal of valid problems of low frequency noise, so compounding the difficulties of some complainants.

And this one, which highlights the importance of fully accounting for fluctuating noise such as the erratic noise levels from wind turbines;

This work confirms the importance of fluctuations as a contributor to annoyance, and the consequent limitation of those assessment methods which do not include fluctuations

When these quotes are considered alongside

- The comments on low frequency by Vestas,
- The concerns of the Northern Ireland Environment Committee regarding ETSU R 97,
- The NASA wind turbine studies of the 80s,
- The Cooper "Cape Bridgewater Study".

The only reasonable conclusion which can be made is the serious issues with modern wind turbine emissions were predicted and the harm to the wellbeing and long term health of wind turbine neighbours is real. The noise assessment in this ES does not address the issues or the real risk of harm in a proportionate and reasonable manner, and provides no substantive assurance that neighbours wellbeing and health will not be compromised.

Noise & Health – main script

1. This application and its whole ES assessment on noise in relation to the introduction of wind turbines into the community, starts from the incorrect premise of if you can't audibly hear something it won't hurt you! Thus any noise below "the human threshold" of hearing is presented as not a problem. The sections are ticked off one by one using quotes that are aimed to be extremely dismissive, suggesting little or no impacts on health or on the amenity of neighbours; these taken mainly from people who have stood to gain financially from the industry through their work and therefore very much biased towards allowing development. This approach avoids the very real need to tackle any of the associated problems by continuous and steadfast denial.
2. This position has been maintained despite the mounting evidence to the contrary. It seeks to justify why concerns of the community should be set aside. It does not, however, wish to find out if the adverse issues for the neighbouring communities result from a single factor which they haven't been able to pin-point yet, whether it's due to a known element they cannot solve; or whether it's a result of a "cocktail" of emissions from turbines.
3. At both Thacksons Well and Palmers Hollow this was raised as a concern, yet the design of Sewstern Lane has not even attempted to leave a sufficient buffer-zone between turbines and the closest village, which it should have done based on available knowledge.
4. Evidence of harm is being reported by neighbours at one location after another in the UK and abroad; all these wind farms are said to be compliant to local standards. Any redress for the victims seems to be very difficult, adding significantly to the levels of stress imposed. This lack of redress means it is more important than ever for the people of this community to avoid being forced into this nightmare position in the first place.
5. Unfortunately UK noise policy to date regarding wind turbines has been very much industry led. This enables turbines to be put up consistently too close to dwellings. We know, in reality, any wind farm which is said to conform to policy may only offer very limited protection for the communities around the site, and then only purely in terms of audible noise. It is a huge mistake to believe that no harm is being done to the people around a site just because a wind farm has been assessed to meet all current standards.
6. People in this area have already been in the unfortunate position of living with the potential of a wind farm on this and the neighbouring sites. They have become familiar with the types of claims made as to why wind farms should be accepted without adequate research and are well aware of the difference between hype and reality.
7. If the process was carried with an altogether more precautionary approach, where complaints were handled by a competent independent body who took time to solve issues and who made sure mistakes were not be repeated; the outcome for neighbours would be substantially different. Instead we start with the presumption that neighbours will have to put up with wind turbines; where we have people "who profit," but remain unaffected by a development, heavily influencing a process deciding just how much harm can be inflicted. We should be asking is it reasonable to be building turbines so close to people at distances where issues are already known to exist? If we ask ourselves are ordinary peoples lives being affected by wind turbines operating, the answer is a loud "YES!" Has this been at a level it has caused families to abandon their homes? Again the answer would be "yes". Has this happened in the UK near to wind

farms said to be compliant with ETSU-R-97? The answer is still "yes". Has the Industry really attempted to sort out the issues?..... "No". So the real question to be sought from the industry at this late stage is "Why not?".

8. This community has come to the conclusion that they will not do anything which would bring a halt for what is an over-subsidized token technology especially since the potential impacts are to a community other than their own. Plus, up until very recently some in the industry have managed to convince some people in one Government Department that the standards they have accepted to enable development do offer some protection; what has not been made clear is that that the level of protection is minimal and does not uphold proper "Duty of Care" for residents.
9. In fact, the longer we have had to deal with this issue, the more we have come to realise just how poor the UK standards are when it comes to wind farm neighbours being able to live unhindered in their homes. The reason why this situation has continued is obvious when you see just how many of the names which first appeared in connection with the formation of the standards have then gone on to feature over and over again in the process reaping rewards made possible by their lack of robustness. It also explains why they fight so hard for them to continue without further restriction.
10. Over the past few years there has been a steady increase in the distances over which people are being adversely affected, which is probably due to the scale and output of modern turbines.
11. It has come to light that it was already known that neighbours noted similar adverse affects from a single turbine up to 3km away in a study carried out for NASA three decades ago.
Feb 1985 Kelley et al. Acoustic Noise Associated with the MOD-1 Wind Turbine: Its source, Impact and Control. US Department of Energy. These field measurements and model results allowed us to conclude the following:
 - ***The annoyance was real and not imagined.***
 - ***The responsible acoustic impulses were being propagated through the air and, in some instances, being focussed on the complainants' homes as a consequence of ground reflection and refraction by the atmosphere.***
12. Seven years ago we were not aware of this or of the many other related low frequency studies. We may, at this stage, have accepted a 2km barrier between homes and turbines but now we know even this is not adequate. Emissions associated with such large turbines have now been measured up to ten kilometres away in homes which have reported having an issue from turbines. This increase in distance is a pattern and not a single event.
13. This application ES has made no comment on recent events which show the distances proposed here between the closest villages and turbines are totally insufficient for protection of residents. The NASA studies of the early eighties clearly demonstrated that these impacts were predictable.
14. Earlier this year Steven Cooper (a senior acoustician) carried out a study which was initially instigated by the wind farm owners: (*The Australian* | 4 February 2015)
www.theaustralian.com.au ~~~
Groundbreaking Australian research has established a "cause and effect" existed between wind farms and health impacts on some nearby residents.....

15. [The review](#) of a study by Steven Cooper of residents living near Pacific Hydro's Cape Bridgewater Wind Farm was undertaken by Paul Schomer, Standards Director of the Acoustical Society of America.
16. As a result of the Cooper research, Dr Schomer said wind farm developers should now say; **"We may affect some people"**.
17. He said regulators charged with protecting health and welfare **"will not be able to say they know of no adverse effects"**.
18. *Pacific Hydro has said previously it did accept the Cooper research had established a cause and-effect link, a claim that was not made in the report.....*
19. Dr Schomer said the Cooper work had shown clearly there was:
"at least one non-visual, non-audible pathway for wind turbine emissions to reach, enter and affect some people".
20. The six people from three households involved in the study had recorded the timing and level of effects they were experiencing.
21. Their notes had shown that impacts corresponded with wind turbine power changes. The subjects did not know what was happening with the wind turbines when they recorded their notes.
22. **"This study finds these six people sense the operation of the turbine(s) via other pathways than hearing or seeing, and that the adverse reactions to the operations of the wind turbine(s) correlates directly with the power output of the wind turbine(s),"**he said.
23. **"The important point here is that something is coming from the wind turbines to affect these people and that something increases or decreases as the power output of the turbine increases or decreases.**
24. *"It really does not matter what the pathway is, whether it is infrasound or some new form of rays or electromagnetic field coming off the turbine blade. If the turbines are the cause, the wind farm is responsible and needs to fix it."*
25. Dr Schomer said criticism that only a small number of people were involved in the study was not relevant. **"One person affected is a lot more than none; the existence of one cause-and-effect pathway is a lot more than none."**
26. This clearly shows human beings are able to pick up something from wind turbines which this ES infer they cannot! All the references made in the noise report as to why humans won't be able to sense or detect vibration/ infrasound/emissions from wind turbines with have proved to be **WRONG** in real life situations. The fact is people can and do "FEEL" turbines and this study proved it.
27. This application was submitted after the results of the Cape Bridgewater / Cooper study became available where he had declared finding a wind turbine signature (WTS) which he was able to pick out from other types of noise, yet this ES noise report refers to the DTI LFN almost ten years old and fails to comment on this recent ground-breaking study which disproved earlier assertions, although they did state *"Health effects in the more usual definition of physiological health therefore remains a theoretical possibility which has neither been proved nor disproved."*(A32) So they do at least admit the possibility of harm to health.
28. However, if they really wanted to protect the amenity of residents they would have taken the time to assess such a major break-through before submitting this application. This rush to submit an application knowing many of the assertions in it are not true must cast doubt on other claims made in regards to noise; for if these "experts" got this

- aspect so very wrong, despite it being their area of expertise, why should we believe them on conclusions drawn from their assertions in areas which lie beyond their expertise, such as health?
29. In light of acousticians making statements based on assumptions of what they think human perception should be and not what it actually is, there is a knock on affect on what relevant standards are appropriate. We have serious doubts about ETSU-R-97 in relation to modern wind turbines.
30. ETSU-R-97 was "thought to offer a reasonable degree of protection to wind farm neighbours," when it was introduced back in 1997. The body of the text highlighted the need for caution when considering installing turbines too close to neighbours with more care where there were more homes. This has occurred because concentration has been focused on the conclusion of ETSU which seems to be at odds with earlier and more cautious parts of the text. For this reason it is seen as "flawed". In real life situations it has not always provided adequate protection and its relevance to much larger turbines has been questioned over and over even by some original authors.
31. Earlier this year the Northern Ireland Environment Committee wrote a report in which it said of wind turbine noise control: "***It seems apparent that current guidelines in respect of permissible levels of noise are no longer adequate and the research evidence available has increased significantly since 1997,***"
- "The Committee therefore recommends that the Department of the Environment should review the use of the ETSU-97 guidelines on an urgent basis with a view to adopting more modern and robust guidance for measurement of wind turbine noise, with particular reference to current guidelines from the World Health Organisation."***
32. Section A8 of the ES noise report says; "*The primary purpose of measuring environmental noise is to assess its effects on people. Consequently, any sound measuring device employed for the task should provide a simple readout that relates the objectively measured sound to human subjective response.*" This primary purpose is not being achieved for residents here.
33. The WHO potential health effects of environmental noise are listed in the noise report as being:
- interference with speech communications
 - sleep disturbance
 - disturbance of concentration
 - annoyance
 - social and economic effects
34. Every single one of these impacts has been reported in association with industrial wind turbines by ordinary people who have found the impacts debilitating and sometimes unbearable. These are people who just want to get on with their lives but find themselves unable to do so because of the genuine impacts.
35. This ES report claims that; "*Evidence in support of health effects other than annoyance and sleep disturbance is weak*" and adds; "*However, the theory that psychological stress caused by annoyance might contribute to adverse health effects in otherwise susceptible individuals seems plausible*".

36. There is absolutely no empathy with the wind farm neighbour whatsoever as it is obvious their amenity is considerably damaged by either repeated annoyance or repeated sleep disturbance.
37. At our previous Appeals we had evidence given by The Davis's who had abandoned their home due to turbine emissions. They took their case to the High Court but it was settled out of court immediately prior to the noise evidence being heard at the National Physical Laboratory. The settlement included a "confidentiality agreement". A Minister answering a Parliamentary question strangely cited the Davis' home as a case of "Noise Nuisance" due to wind turbines and that it had been "resolved". The reality is the Davis house is no longer a home and their property was bought cheaply by Fenland Wind Farm. Their parents' house next door is also no longer occupied.
38. Section A34 of the ES report says of sleep disturbance;
"Although sleep seems to be a fundamental requirement for humans, the most significant effect of sleep loss seems to be increased sleepiness the next day," "Some authorities take a precautionary approach, under which any kind of physiological response to noise is considered important, irrespective of whether there are any next day effects or not"
and part of another quote suggests impacts on sleep: **"do not need to be considered as adverse effects..."**
39. We are amazed that sleep disturbance, a recognized contributor to poor health is trivialized to this extent by the ES. This is irresponsible; Brake, the well known road safety charity amply confounds the ES sleep position on its website referencing a number of reports.
<http://www.brake.org.uk/news/15-facts-a-resources/facts/485-driver-tiredness>
40. In terms of sleep disturbance, if it is a one-off, it may be possible to catch up the next day. However, in the case of wind turbines, the risk is sleep disturbance occurring night after night for lengthy periods, which is a known health deficit. The amenity of ones home is lost from that point on, with seemingly little or no redress.
41. Sleep disturbance on an extended basis is also recognized as a form of torture by the "UN Convention Against Torture", which the UK signed up to in the 1980s. It recognizes: **"Sleep deprivation can cause impaired memory, and cognitive functioning, decreased short-term memory, speech impairment, hallucinations, psychosis, lowered immunity, headaches, high blood-pressure, cardiovascular disease, stress, anxiety and depression"**.
42. Sleep disturbance, which was noticed as a result of wind farms emissions, was intentionally removed from the draft document DTI LFN study repeatedly referred to by the ES study("The Measurement of Low Frequency Noise at Three UK Wind Farms, often referred to as the Hayes McKenzie Report 2006). This document is currently adopted as a policy document after the **reference to sleep disturbance was removed** by an unnamed hand because of the links to health. An author of the report claimed the "sleep disturbance" was removed because it was not "in the remit" when at the High Court under oath.
43. The DTI LFN report has been used ever since claiming it demonstrated there are no health impacts: whereas in reality it did anything but.
Even after this evidence came to light acousticians continued to make claims about health, but with the slight change of "There are no **direct** health impacts from wind turbines". This misdirection could equally be applied to cigarettes because it again is a dose related response and not a one off. Once again it is the victims who are left to take on the legal challenge to protect their environment although things are beginning

to change with some civic authorities taking the issues more seriously.

44. We have heard reports local EHO's admitting to having to stick solely to policy in assessing wind turbine noise, rather than using a breadth of other sources, due to potential cost implications for the Authority.
45. It is no good for local residents to know they attend special courses to hone their responses in the correct and prescribed manner. This coaching essentially removes any protection and renders their responses as almost meaningless and takes away any real and unbiased assessment which residents would like to believe is part of the process. They are quoted at Appeals as having "No objection" when it should be stated they are limited in what they are able to say, which is not the same thing at all.
46. The ES noise report on adverse impacts section A41 says:
"Whether or not an exposed individual has a personal interest in a given sound often has a significant bearing on their acceptance of it. For example, if recipients gain benefit from an association with the sound producer, or they accept that the sound is necessary and largely unavoidable, then they are often more tolerant of it." If taken at face value this would seem plausible until you realize many landowners are subject to gagging clauses.
47. The following evidence are from David Mortimer (submission 24, Australian Federal Senate Inquiry) an Australian host landowner, who did gain financially
My wife and I have hosted and resided in close proximity to industrial scale wind power turbines on our farm from late 2004 until we sold the farm October 2014. We continue to reside in the same proximity to the same turbines. Our main reason for making this submission is to bring to the Senates' attention the adverse health effects we suffer as a direct result of being continually subjected to infra and low frequency noise (ILFN) produced by the turbines.....
We signed up for the Lake Bonney wind farm in 1997 after being seduced by the wind farm promoter in 1996. We believed the lies the promoter told us relating to the likely noise levels. We would not hear the turbines over the noise of the wind in the trees. In fact, the resulting blade noise was quite disturbin but we were convinced that we were 'doing our bit' for the ecology as well as securing our retirement funding that we convinced our immediate neighbours to also sign up.....

With the benefit of looking back in time, I began almost immediately the turbines became operational to suffer symptoms now defined as "Wind Turbine Syndrome".....we built a new home 5km further from the farm house where we could neither see nor (usually) hear the turbines.....when the wind turbine syndrome symptoms (particularly the sensations of heart palpitations) did not abate when we moved into our new home, I consulted my local GP.....we left the district for a weekend and noticed that we suffered none of the usual symptoms and sensations. When we returned, home so did the symptoms.....
48. *The severity of the symptoms appear to be worsening to the extent that we now have to leave the district at least once per fortnight to be at least 35km from wind turbines in order to have a decent night sleep.*
49. And a recent study from Iran looking at impacts on wind turbine workers:
[Abstract] Noise from wind turbines is one of the most important factors affecting the health, welfare, and human sleep. This research was carried out to study the effect of wind turbine noise on workers' sleep disorder. For this, Manjil Wind Farm, because of the greater number of staff and turbines than other wind farms in Iran, was chosen as case study.....for the first time in the world, examines the impact of wind

*turbine noise on sleep disorder of workers who are more closer to wind turbines and exposed to higher levels of noise. So despite all the good benefits of wind turbines, **it can be stated that this technology has health risks for all those exposed to its sound.***

50. A69 of the ES noise report has a section on "Infrasound" which states:
Over the past few years there has been considerable attention paid to the possibility that operational wind farms may radiate sufficiently high levels of infrasound to cause health problems. It has, however, been the case that dedicated research investigations have shown this not to be the case."
51. And then in section 72 referring to the Defra report by Leventhall it says:
"Dr Leventhall notes that despite numerous published studies there is little or no agreement about the biological effects of infrasound or low frequency sound on human health. Leventhall notes that direct evidence of adverse effects of exposure to low-intensity levels of infrasound (less than 90dB) is lacking,.....From this Leventhall therefore concluded that most people can be reassured that there will be no serious consequences to peoples' health from infrasound.
52. Yet ten years on in 2015:
*The "parliament" of Germany's medical profession has called on its leaders to support a **halt to further wind farm developments near housing until more research has been undertaken into the possible health impacts of low-frequency noise from wind turbines.*** The issue was debated at the German Medical Assembly in Frankfurt on Friday and transferred to the executive board of the German Medical Association.
*It said the health effects of infrasound (below 20 Hz) and low-frequency sound (below 100 Hz) in relation to emissions from wind turbines were "still open questions", as were "the effects of noise below the hearing threshold or lower frequencies with increasing exposure duration". **The assembly said the erection of more turbines close to settlements should be stopped until there was reliable data to exclude a safety hazard.**"*
53. The noise report makes numerous references to the DTI LFN 2006 Report by Hayes McKenzie. Extracts from the memorandum to Parliament by Peter Hadden (2008) again shows why it is unwise to rely on this report:
*Following public concern after a published article noted "... that wind turbines at a Cornish wind farm was giving rise to health problems associated with low frequency noise emissions ...", the Dti (now known as BERR) appointed acousticians "Hayes McKenzie" to investigate. In August 2006, the Dti published the Hayes McKenzie report, "The Measurement of Low Frequency Noise at 3 UK Wind Farms". Although the acousticians prepared the report **without any apparent or acknowledged contribution by medical or epidemiologic experts**, the report for Dti included in its conclusions, [p 66] the following quotation from a WHO Community Noise Report as a summary of its findings:
"Community Noise, WHO `there is no reliable evidence that infrasound below the hearing threshold produce physiological or psychological effects'".*
54. This Hayes McKenzie Dti report—issued in 2006—repeats this quotation on pages 2, 10, 46 and 66 of the report. However, this quotation appears in the superseded "WHO Community Noise Paper 1995". The implication is that the H-M/Dti report appears to ignore the World Health Organisation Guidelines for Community Noise published in 1999, which superseded the 1995 document.
55. This is significant because the WHO Guidelines for Community Noise 1999 clearly states in section 3.8: **"The evidence on low frequency noise is sufficiently strong to**

warrant immediate concern".

"Health effects due to low frequency components in noise are estimated to be more severe than for community noises in general (Berglund et al 1996)".

56. And from section 4.4 WHO Guidelines, 1999, Values: *"It is not enough to characterise the noise environment in terms of noise measures or indices based on energy summation (eg LAeq) because different critical health effects require different description. ... For indoor environments, reverberation time is also an important factor. If the noise includes a large proportion of low frequency components, still lower guideline values should be applied"*.
57. The "WHO 1999, Guidelines, Critical health effects" for sleep disturbance, sets a limit of total noise in the bedroom at night at 30dBA, before additional reductions are applied to reflect the presence of LFN and the pulsating character of the noise.
58. Section 3.8 of WHO 1999, clearly states, *"Many acoustical environments consist of sounds from more than one source. For these environments, health effects are associated with the total noise exposure, rather than with the noise from a single source (WHO 1980b)*. In contrast ETSU R 97 allows noise levels to a maximum of 43dB(A) at night.
59. The 2006 Hayes McKenzie/Dti Report concluded on page 66: *"... infrasound associated with modern wind turbines is not a source which will result in noise levels which may be injurious to health of a wind farm neighbour"*.
60. No evidence has been found that the authors of this report have any medical qualifications to make this statement, nor is there any evidence in the report that medical experts were consulted. There is no substantive epidemiological or physiological evidence in the Dti report to support this conclusion.
61. Public concern is reflected in the questions on the issue of wind turbine noise and its adverse impact on health that have been brought to the House of Commons. Referring to *Hansard* 15 June 2007: column 1418W, House of Commons:
62. Mr Geoffrey Cox, QC, MP: *To ask the Secretary of State for Trade and Industry pursuant to the answer of 14 May 2007, Official Report, column 1003W, on turbines: health hazards, what qualifications Hayes McKenzie possessed in relation to infrasound emitted by wind turbines; and what role medical experts played in the production of the report. (142509)*
63. Malcolm Wicks: *The Hayes McKenzie report for the Dti "The measurement of Low Frequency Noise at three UK wind farms" investigated the levels of low frequency noise and infrasound emitted by wind turbines, **it was not within the remit of the study to undertake new medical analysis.***
64. A House of Commons debate 5 July 2007 (1078-1081) addressed wind turbine noise: Mr John Whittingdale *"... if he will review the noise limits for onshore wind farms" (147642)*
65. Malcolm Wicks: *We continue to support the approach set out in PPS 22 renewable energy ... "ensure that renewable energy developments have been located and designed in such a way to minimise increases in ambient noise levels" ... I do not consider that a review of that guidance (ETSU R 97) is justified at present.*
66. Mr Whittingdale: *Is the Minister aware of the growing evidence that people who live in close proximity to wind turbines suffer significant risks of adverse health effects? Will he give urgent consideration to increasing the minimum separation distance from large turbines to at least 2 km? ...*

- 67.** Malcolm Wicks: *No, I am not aware of such evidence, and I do not believe it exists. A Government commissioned Hayes McKenzie study published 2006 concluded that there was **no evidence of adverse health effects from wind turbines ...***
68. By encouraging the wind industry to design and set its own standards on an acceptable noise level from wind turbines measured at nearby homes, the BERR (Dti) has legalised, in Town Planning terms, noise levels that can be so disturbing to family life that some families are forced to abandon their homes or suffer sleep deprivation. It has set a standard that might easily be manipulated to the benefits of developers by comparing noise levels with background noise levels, which in most instances are measured by the developers and not checked by Local Councils because of lack of resources. BERR (Dti) has made no efforts to investigate, with independent health researchers and experts, the reported serious health consequences to some families where wind turbines are built too close to homes. Instead, BERR (Dti) has unreasonably asked acousticians to give an opinion on health issues and astoundingly, BERR (Dti) has acted on that opinion.
69. *By carefully promoting the development of onshore wind energy as Government Policy and by promulgating wind energy as the vital part of the provision of future UK energy supply and therefore in the national interest, BERR (Dti) has virtually denied families their rights under Article 8 of the Human Rights Act: Article 8 provides:*
- a. Everyone has the right to respect for his private and family life, his home and his correspondence.
 - b. There shall be no interference by a public authority with the exercise of this right except as in accordance with the law and as necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedom of others.
70. It is clear that some families, who suffer sleep deprivation and consequent health problems, have had their right to respect for their private and family life violated. However, by setting high levels of allowable noise from wind turbines operating 24/7, Planning permission has been granted because developers have provided assurance that the ETSU R 97 noise guidance would be met.
71. In a speech to the Human Rights Lawyers Association in London, 29 September 2006, the Lord Chancellor stated: "We in Government will campaign passionately and defiantly for human rights for everyone in Britain. Because we believe it is the foundation of both our security and our prosperity".
72. Clearly, in a desperate effort to ease the Planning process to allow the building of large numbers of industrial wind turbines in well-populated rural communities, BERR (Dti) has had to support excessively high noise level standards in order to squeeze wind turbines close to family homes. There is no evidence BERR has considered the health implications on the families, and no evidence BERR has considered the basic rights of families under Article 8 of the HR Act 1998.
73. *allowing developers to make greater profit margins by developing onshore close to homes on marginal sites at the expense of ordinary families is a violation of basic Human Rights. Allowing wind array developers to make higher profits at the cost of individual families is repugnant and contrary to the stated intention of Parliament to protect basic Human Rights for citizens of the UK.*
74. The people of the UK have no confidence in the way the BERR (Dti) has managed the problem of noise from wind turbines. The only way to restore and build confidence is to:

- a. First, set a 2 kilometre zone on all industrial wind turbine sites where turbines of over 0.6MW and 50 metres high are proposed: No industrial wind turbine should be within 2 kilometres of a dwelling.
 - b. Second, there should be an independent working party of acousticians and medical experts to fully explore the problems of wind turbine noise and the health consequences.
 - c. Third, the NAO should be appointed to ensure that there is independence during the process and that there are no conflicts of interest. The Equality and Human Rights Commission should be appointed to ensure basic Human Rights are respected during the whole process of setting new standards for control of noise and setting new Planning Guidance.
75. Up until very recently the wind industry gave out the message that the low-frequency issue, was not low-frequency but probably AM, and AM wasn't really an issue because it was a rare occurrence.
76. However, at the same time as this was being said, their own noise experts were working out an industry acceptable condition because they couldn't adhere to the one known as the Denbrook condition so wanted one which wouldn't prevent development.
77. Meanwhile even though low-frequency was supposed not to be an issue, the turbine manufacturer Vestas wrote to the Danish Government to ask that they didn't adopt a low-frequency standard because it would cause significant problems for them:
78. **Jun 2011 Vestas CEO of Vestas to Minister of Environment, Denmark. (Translation)**
I am writing this letter to express my concern regarding the limits for low frequency noise from wind turbines now being proposed.
.....we were extremely surprised to find that the proposed new regulations do in fact include a significant and severe tightening of the previous noise regulations.
- In fact according to our analyses, the most economical turbines, **the 3MW category are the ones that will be strongly affected by the new rules. This applies to open terrain in particular, where in future low frequency noise will dictate and increase the distance requirements to neighbours for close to half of the projects that we are already aware of over the next 2 to 3 years.***
- In a small country such as Denmark this means that a significant number of projects will not be viable as the increased distance requirements cannot be met whilst maintaining a satisfactory business outcome for the investor.....*
- At this point you may have asked yourself **why it is that Vestas does not just make changes to the wind turbines so that they produce less noise? The simple answer is that at the moment it is not technically possible to do so...***
- The proposed low frequency limit values may hinder the development of onshore wind in Denmark.....**there is a danger that the regulations will be copied by other countries.....***
79. If we consider this letter carefully **it is exactly this turbine size by this manufacturer which this developer is proposing here**, in exactly the type of terrain that Vestas says will increase the distance requirements to neighbours. This is in total contradiction to the A73 section of the ES noise report which says: "*In fact what*

those concerned observers failed to account for is that highly sensitive electronic measuring equipment designed solely to detect such infrasonic sounds and vibrations in orders of magnitude than even the most sensitive human.

80. We can conclude that it is dangerous not to apply the "precautionary principle" when it comes to emissions from wind turbines. There is something which comes from turbines which leads to significant issues for neighbours. The issues are too widespread to be coincidence.
81. For the communities there is little in the way of redress and homes can become places of torture. Councils do not have the resources or the expertise to solve issues once they occur and rely on experts, very often the same experts who instigated the problem in the first place. Problem turbines lead to years of anxiety for neighbours who are very often treated in a despicable manner by those who have vested interests in maintaining a position for financial reasons.
82. We hope to see independent research, standards which actually protect people and a buffer zone based on the size of turbines. Just on the level of information available to us at this time we believe turbines of the scale proposed cannot be built without causing problems for local communities. We agree with the Northern Ireland Environment Committee that ETSU needs immediate updating and we agree with the "parliament" of Germany's Medical Profession which says the building of turbines should stop and a proper assessment of potential health impacts carried out. We also believe that any new consented wind farm should have a permanent measuring facility set up which measures all frequency ranges at all times. The data should be accessible to anyone who wants to look at it and any exceedences should result in the removal of the wind farm if issues are not sorted out within a very limited time frame. The community and not the developer should have final say and should have the ability to have them removed if health issues occur that may be linked to the turbines. The communities should be able to ask the Council to have the ability to get the turbines turned off to assess the issues and refusal should result in the automatic removal of the turbines.

Noise: Relevant Policy

The EU Policy on environmental noise

Updated 22/04/2015

Environmental noise pollution relates to ambient sound levels beyond the comfort levels as caused by traffic, construction, industrial, as well as some recreational activities. It can aggravate serious direct as well as indirect health effects, for example damage to hearing or sleep and later mental disorder, as well as increasing blood pressure. Noise effects can trigger premature illness and, in extreme cases, death. Night-time effects can differ significantly from day time impacts. The largest impact of environmental noise is on annoyance and sleep disturbance, health effects of noise to which more than 30% of EU population may be exposed.

The external costs of noise in the EU amounts to at least 0,35% of its GDP, but much higher values may be found as new findings become available. In general it is considered amongst the most relevant environment & health problems, just behind the impact of air quality.....The [Environmental Noise Directive](#) (2002/49/EC) is one of the main instruments to identify noise pollution levels and to trigger the necessary action both at Member State and at EU level.....

As more information about the health impacts of noise became available, and as it has become clear that global measures are the most cost-effective, the need for a higher level of protection of EU citizens through EU-wide measures became more imminent.

SKDC's Core Policy documents:

Working with partners and residents to develop a place where people really matter.

SP2 .3.2.6 Support will be given to proposals and activities that protect, retain or enhance existing community assets, or that lead to the provision of additional assets that improve community well-being.

EN1:PROTECTION AND ENHANCEMENT OF THE CHARACTER OF THE DISTRICT

All development proposals and site allocations will be assessed in relation to:

11. noise and light pollution

Sustainable Development- Development to improve quality of life and protect the environment in balance with the local economy, for current and future generations.

NPPG:

Local planning authorities should ensure that health and wellbeing, are considered in local and neighbourhood plans and in planning decision making.

The link between planning and health has been long established. The built and natural environments are major determinants of health and wellbeing.

development proposals can support strong, vibrant and healthy communities and help create healthy living environments

- ⤴ the local plan promotes health, social and cultural wellbeing and supports the reduction of health inequalities;
- ⤴ the local plan considers the local health and wellbeing strategy and other relevant health improvement strategies in the area;
- ⤴ **potential pollution and other environmental hazards, which might lead to an adverse impact on human health, are accounted for in the consideration of new development proposals**

Achieving Sustainable Development:

International and national bodies have set out broad principles of sustainable development. Resolution 42/187 of the United Nations General Assembly defined sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The UK Sustainable Development Strategy *Securing the Future* set out five 'guiding principles' of sustainable development: living within the planet's environmental limits; **ensuring a strong, healthy and just society**; achieving a sustainable economy; **promoting good governance; and using sound science responsibly.**

Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life...:

- ⤴ improving the conditions in which people live...

Included in the Core Planning Principles:

contribute to conserving and enhancing the natural environment and reducing pollution.

Under the "Environment" heading (165):

should consider all the likely significant effects on the environment, economic and social factors.

11. Conserving and enhancing the natural environment: 109

The planning system should contribute to and enhance the natural and local environment by: include

- ⤴ preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution ...

110 In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment

120 To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

123 Planning policies and decisions should aim to:

- ⤴ avoid noise from giving rise to significant adverse impacts²⁷ on health and quality of life as a result of new development;
- ⤴ mitigate and reduce to a minimum other adverse impacts²⁷ on health and quality of life arising from noise from new development, including through the use of conditions; *[not exclusively!]*
- ⤴ identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.