

5.2. PPS7

5.2.1. PPS7 states:

5.2.2. *"ensuring people have decent places to live by improving the quality and sustainability of local environments and neighbourhoods"*

5.2.3. *"All development in rural areas should be well designed and inclusive, in keeping and scale with its location, and sensitive to the character of the countryside and local distinctiveness"*

5.2.4. *"have regard to the amenity of any nearby residents or other rural businesses that may be adversely affected by new types of on-farm development"*

5.2.5. Section 15 states: *"Planning authorities should continue to ensure that the quality and character of the wider countryside is protected and, where possible, enhanced."*

5.2.6. Proposals which site wind turbines within 1.5km of residential dwellings can not be said to enhance the quality of the countryside nor have regard to the amenity of local residents and must be rejected.

5.3. PPS23

5.3.1. PPS23 states:

5.3.2. *"the precautionary principle should be invoked when:*

- *there is good reason to believe that harmful effects may occur to human, animal or plant health, or to the environment*
- *the level of scientific uncertainty about the consequences or likelihood of the risk is such that best available scientific advice cannot assess the risk with sufficient confidence to inform decision-making."*

5.3.3. Application of ETSU R 97 is subordinate to the commitment to the Precautionary Principle outlined in PPS23. The objections to ETSU R 97 are so fundamental and the concerns regarding its validity so great, as is the evidence of human harm, that the precautionary principle must be invoked and consequently PPS 23 and EV/23 applied and permission refused on that account.

5.4 East Midlands Regional Spatial Strategy (RSS8)

5.4.1. Policy 41 states: *"In establishing criteria for onshore wind energy Development Plans and future Local Development Frameworks, should give particular consideration to: the effect on the built environment (including noise intrusion)."*

5.4.2. Proposals that site wind turbines within 1.5km of residential dwellings do not give sufficient consideration to the noise effects on the built environment and are therefore in contravention of RSS8.

5.5. Harborough District Local Plan

5.5.1. Harborough District Local Plan states that:

5.5.2. *"the district council will grant planning permission for the development of renewable energy schemes provided that they do not have an unacceptable impact on the landscape, features of historic and archaeological interest, nearby land use, residential amenity....."*

5.5.3. *"..proposals should not adversely affect the established character of the surrounding area in terms of scale, space around buildings, density, design, colour and texture of materials"*

5.5.4. *"...new development should not adversely affect the amenities of neighbouring users..."*

5.5.5. Policy EV/5 states: *"The district council will refuse planning permission for development proposals in the countryside unless the following criteria are met:*

- *The development does not adversely affect the character and appearance of the countryside*
- *The development does not adversely affect the amenities of the residents of the area*
- *Any new buildings are sited in a position that minimises their impact on the landscape and on important views into and out of villages"*

5.5.6. Clearly, any development which places wind turbines within 1.5km of residential dwellings will adversely affect the amenity of the residents and must be rejected.

5.5.7. Policy EV/23 states: *"the District Council will impose conditions on planning permissions to ensure that the development does not have an adverse effect on the character of its surroundings or harm the amenities of nearby users, through noise...If the District Council is not satisfied that these adverse effects would be overcome by the imposition of conditions, planning permission will not be granted"*

5.5.8. The evidence presented in this paper provides incontrovertible proof that wind turbines emit levels of noise harmful to human health and wellbeing. ETSU R 97 does not provide sufficient protection for residents as has been amply demonstrated by several leading researchers.

5.6 Leicestershire, Leicester and Rutland Structure Plan 1996-2016 Resource Management Policy 1

5.6.1. LLRSP 1996-2016 states: *"All new development will minimise or avoid air, noise, water, land and light pollution"*

5.6.2. Developments within 1.5km of residential dwellings engender several types of pollution: noise, light (the likelihood of aviation lights) and shadow flicker, and will certainly not be minimised.

6. Overall Conclusions

7.1. The only mitigation of sleep disturbance from industrial wind turbine noise is a setback of at least 1.5km and probably greater. This estimate is based on data from present installations, many of which have a much smaller rated capacity than those proposed by Nuon. Most of the village of Swinford as well as outlying properties are within 1-1.5km of the proposed site and there is therefore a very high risk that a large proportion of residents would be adversely affected. **The application must be rejected.**



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14th June 2009

7. Bibliography

Acoustic Ecology Institute. AEI special report: Wind energy noise impacts. <http://www.acousticecology.org/srwind.html>

Adams JW. 2008. The Public Health Issue. Essex County Wind Resistance. <http://essexcountywind.wordpress.com/2008/09/26/public-health-and-industrial-wind-turbine-noise-in-ontario/>

Basner M et al. 2008. Aircraft noise: Effects on macro- and microstructure of sleep. *Sleep Medicine*, 9 (4): 382-387

Basner M. 2008. Nocturnal aircraft noise exposure increases objectively assessed daytime sleepiness. *Journal of Sleep Research* 17:Supplement 1;P512

Bennett D. 2008. Evidence to the Environment Court, Wellington, NZ. Appeal No. ENV-2007-WLG-000098 between Motorimu Wind Farm Ltd and Palmerston North City Council and Horowhenua District Council.

van den Berg GP. 2003. Wind turbines at night: acoustical practice and sound research. *Euronoise 2003*. Paper 160.

van den Berg GP. 2004. Effects of the wind profile at night on wind turbine sound. *Journal of Sound and Vibration*. 277:955-970

van den Berg GP. 2005: The beat is getting stronger: the effect of atmospheric stability on low frequency modulated sound of wind turbines, *Journal of Low Frequency Noise, Vibration And Active Control* 24 (1), pp. 1-24

van den Berg G P. 2006 The sound of high winds: the effect of atmospheric stability on wind turbine sound and microphone noise *Doctoral Thesis* Groningen, The Netherlands; Rijksuniversiteit Groningen

van den Berg G P., et al. 2008. WINDFARM perception. Visual and acoustic impact of wind turbine farms on residents. FP6-2005-Science-and-Society-20. Specific Support Action Project no. 044628

Boselli M et al. 1998. Effect of age on EEG arousals in normal sleep. *Sleep*, 21 (4): 351-357

Bowdler D. 2007. ETSU-R-97: why it is wrong. New Acoustics. www.newacoustics.co.uk

Bowdler D. 2008. Amplitude modulation of Wind Turbine Noise. A Review of the Evidence

Bruck D et al. 2008. Auditory arousal thresholds as a function of sounds of different pitches and patterns. *Journal of Sleep Research* 17:Supplement 1;P508

Bullmore A. Wind farm noise, wind shear. Wind Turbine Noise, Institute of Acoustics. Bristol 16th January 2009.

Butre J-L. 2005. French St. Crepin windplant noise survey results (2005), cited as a personal communication from J-L Butre, Ventducobage, 11-5-05 in Pierpont N. 2006.

Chouard C-H. 2006. Le retentissement du fonctionnement des eoliennes sur la sante de l'homme [Repercussions of wind turbine operations on human health]. French National Academy of Medicine. Panorama du medecin, 20 March 2006

Davis J and Davis S. Noise pollution from wind turbines – living with amplitude modulation, low frequency emissions and sleep deprivation. Wind Turbine Noise 2007.

DTI. 2006. The Measurement of Low Frequency Noise at Three UK Wind Farms – W/45/00656/00/00 – Hayes McKenzie Partnership

Frey BJ. and Hadden PJ. 2007. Noise radiation from wind turbines installed near homes: effects on health. www.windnoisehealthhumanrights.com

Harding, K and Feldman, M. 2008. Sleep disorders and sleep deprivation: An unmet public health problem. J Am Acad Child Adoles Psych. 47:473-474

Harry A. 2007. Wind turbines, noise and health. www.savewesternny.org/pdf/wtnoise_health_2007_a_barry.pdf

Hart, CN et al. 2008. Shortened sleep duration is associated with pediatric overweight. Behav Sleep Med 6:251-267

Kabes DE and Smith C. 2001. Lincoln Township Wind Turbine Survey, Agricultural Resource Center, University of Wisconsin Extension/Cooperative Extension, May 16, 2001.

Kamperman GW and James RR. 2008. Simple guidelines for siting wind turbines to prevent health risks. Noise-Con 2008. Dearborn, Michigan.

Kamperman GW and James RR. 2008b. The "How To" guide to siting wind turbines to prevent health risks from sound. <http://www.windturbinesyndrome.com/wp-content/uploads/2008/11/kamperman-james-10-28-08.pdf>

Martin SE. et al. 1997. The effect of nonvisible sleep fragmentation on daytime function. American Journal of Respiratory and Critical Care Medicine, 155 (5): 1596-1601

Meerlo, P et al. 2008 Restricted and disrupted sleep: Effects on autonomic function, neuroendocrine stress systems and stress responsivity. Sleep Med Rev. 12:197-210

Moorhouse A et al. 2007. Research into Aerodynamic Modulation of Wind Turbine Noise. Final Report. DEFRA Contract NANR233

Muzet A, Miedema H. 2005. Short-term effects of transportation noise on sleep with specific attention to mechanisms and possible health impact. Draft paper presented at the Third Meeting on Night Noise Guidelines, WHO European Center for Environment and Health, Lisbon, Portugal 26-28 April 2005. Pp. 5-7 in *Report on the Third Meeting on Night Noise Guidelines*, available at: http://www.euro.who.int/Document/NOH/3rd_NNG_final_rep_rev.pdf.

Pedersen E and Persson Waye K. 2003. "Perception and annoyance of wind turbine noise in a flat landscape", Proceedings of Internoise 2002, Dearborn

Pedersen E and Persson Waye K. 2004. Perception and annoyance due to wind turbine noise—a dose-response relationship *J. Acoust. Soc. Am.* 116 3460–347

Pedersen E and Persson Waye K. 2007 Response to wind turbine noise in different living environments *Occup. Environ. Med.* 64 480–6

Pedersen E. and Persson Waye K. 2008. Wind turbines – low level noise sources interfering with restoration? *Environmental Research Letters.* 3:015002

Phipps R et al. 2007. Visual and noise effects reported by residents living close to Manawatu wind farms: preliminary survey results. Evidence to the Joint Commissioners, 8th-26th March 2007, Palmerston North

Pierpoint N. 2005. Health, hazard, and quality of life. Wind power installations – how close is too close? www.windturbinesyndrome.com.

Pierpont N. 2006. Wind Turbine Syndrome: Noise, Shadow Flicker, and Health. www.windturbinesyndrome.com.

Pierpont N. 2009. Wind Turbine Syndrome: A Report on a Natural Experiment. In press.

Pirrerera S, De Valck E, Cluydts R. 2009. Nocturnal road traffic noise and sleep quality: Habituation effects assessed in a test-retest field situation. *Sleep* 32:A422.

Rashleigh S. 2008 and 2009. Evidence to the Montreathmont Public Enquiry, Angus, Scotland. See also: <http://www.spaldingtoday.co.uk/news/Bicker-house-blighted-by-turbines.4378933.jp>

Saremi M et al. 2008. Sleep related arousals caused by different types of train. *Journal of Sleep Research* 17:Supplement 1;P394

Schneider CP. 2007. Accuracy of Model Predictions and the Effects of Atmospheric Stability on Wind Turbine Noise at the Maple Ridge Wind Power Facility, Lowville, NY.

Scottish Executive. 2007. Scottish Planning Policy SPP 6 Renewable Energy. Annex A.

Stigwood M. Large wind turbines – are they too big for ETSU-R-97. Wind Turbine Noise, Institute of Acoustics. Bristol 16th January 2009.

The Noise Association. 2006. Location, location, location. An investigation into wind farms and noise by The Noise Association.

Todd N et al. 2008. Tuning and sensitivity of the human vestibular system to low-frequency vibration. *Neuroscience Letters* 444;36–41

Welsh Affairs Committee, *Wind Energy*, 13 July 1994, HC 336-I 1993-94, xxvi, para 71

Figure 1. Sound level and annoyance for different noise sources (van den Berg 2008)

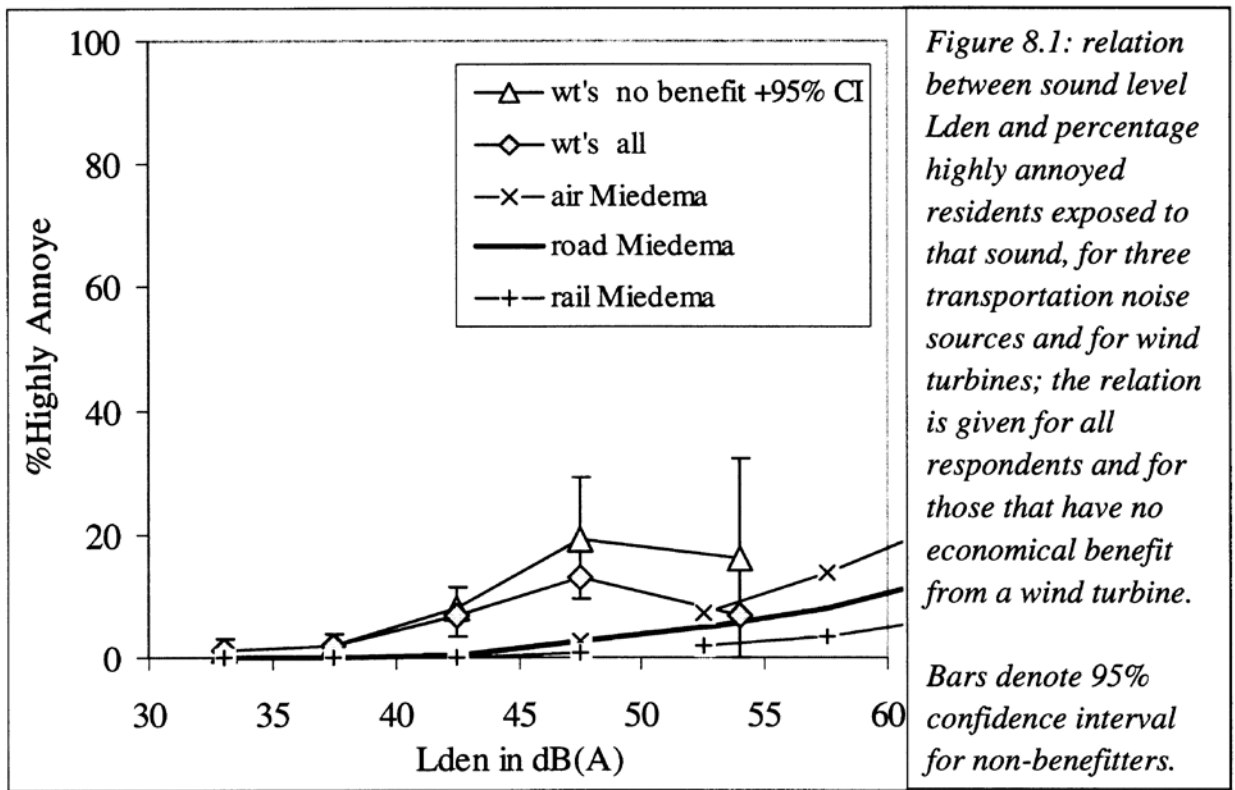
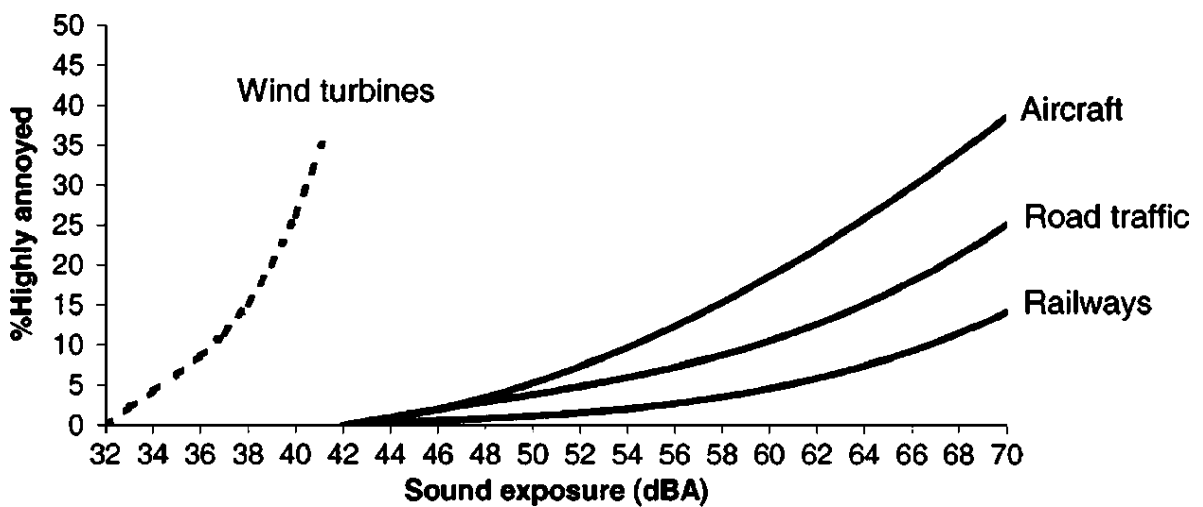


Figure 2. Sound level and annoyance for different noise sources (Pedersen E and Persson Waye, 2004)



Sound exposure is for wind turbines calculated A-weighted L_{eq} for a hypothetical time period and for transportation DNL.

Table 1. Recommendations for setback of residential properties from industrial wind turbines

Note 1. The 2km limit from edges of towns and villages seems to have been set more for visual than noise reasons

Authority	Year	Notes	Recommendation	
			Miles	Kilometres
Frey & Hadden	2007	Scientists. Turbines >2MW	>1.24	>2
Frey & Hadden	2007	Scientists. Turbines <2MW	1.24	2
Harry	2007	UK Physician	1.5	2.4
Pierpont	2008	US Physician	1.5	2.4
Welsh Affairs Select Committee	1994	Recommendation for smaller turbines	0.93	1.5
Scottish Executive	2007	See note 1.	1.24	2
Adams	2008	US Lawyer	1.55	2.5
Bowdler	2007	UK Noise engineer	1.24	2
French National Academy of Medicine	2006	French physicians	0.93	1.5
The Noise Association	2006	UK scientists	1	1.6
Kamperman & James	2008	US Noise engineers	>.62	>1
Kamperman	2008	US Noise engineer	>1.24	>2
Bennett	2008	NZ Scientist	>0.93	>1.5
Acoustic Ecology Institute	2009	US Noise engineers	0.93	1.5