



Comhshaoil, Pobal agus Rialtas Áitiúil
Environment, Community and Local Government

25th October 2013

Dr. Tony Holohan,
Chief Medical Officer,
Department of Health,
Hawkins House,
Hawkins Street,
Dublin 2

Re. Department of Health perspective on Wind Farm Noise/Shadow Flicker

Dear Dr. Holohan,

Please find enclosed an e-mail notification that was sent to the Environmental Health area of your Department on 26th September 2013. It asked if the Department of Health has a national position on noise/ shadow flicker from wind turbines from a health impacts perspective.

The Department of the Environment, Community and Local Government – in conjunction with the Department of Communications, Energy and Natural Resources and other stakeholders - is currently undertaking a targeted review of its 2006 Onshore Wind Energy Development Guidelines focusing on noise, proximity and shadow flicker. Under Section 28 of the Planning Acts, both planning authorities and An Bord Pleanála must have regard to the Guidelines in considering applications for Wind Farm developments. A copy of the existing guidelines is available at

<http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownload.1633.en.pdf>

The revised guidelines will – like all other new or revised guidelines – go out for extensive public consultation in draft form for a period of 6 weeks to 2 months to allow for publication of the final guidelines in 2014.

As you may be aware, there has been significant public debate on the development of wind energy nationally including a number of recent Oireachtas debates on the issue as well as extensive media coverage. One issue that has been raised is whether there are possible public health impacts that may arise from wind farm developments. In the interests of addressing any community concerns, the perspective of the Department of Health on this matter - and noise/shadow flicker specifically – is important. I understand that your Department has already received some representations in relation to this issue already.

The Minister for Housing and Planning, Ms. Jan O'Sullivan T.D., has indicated that the public consultation process should commence by end November 2013 and this Department is currently drafting the revised guidelines. The Sustainable Energy Authority of Ireland (SEAI) has commissioned consultants to carry out a study on the significance of noise in relation to onshore wind farms – which will input into the guidelines review - but public health is not within its scope.

It would be appreciated if the Department of Health could provide preliminary observations on this matter by Tuesday, 12th November 2013 to be considered in the preparation of the draft revised wind energy guidelines for public consultation.

Yours sincerely



Frank Gallagher
Planning Section
01-8882370

E-mail – frank.gallagher@environ.ie

From: Miriam Tiernan - (DECLG)
Sent: 26 September 2013 11:08
To: michael_smith@health.gov.ie; dave_maguire@health.gov.ie
Cc: Aileen Doyle - (DECLG); Frank Gallagher - (DECLG)
Subject: National position on noise/ shadow flicker from wind turbines -health impacts perspective

Good morning,

The Department of the Environment, Community and Local Government – in conjunction with the Department of Communications, Energy and Natural Resources and other stakeholders – is now undertaking a targeted review of the Wind Energy Guidelines 2006 focusing on noise, proximity and shadow flicker. The existing Wind Energy Development Guidelines were published in June 2006. They provide advice to planning authorities on catering for wind energy through the development plan and development management processes. The guidelines are also intended to ensure a consistency of approach throughout the country in the identification of suitable locations for wind energy development and the treatment of planning applications for such developments.

The Department issued a press notice in January of this year inviting submissions from the public on this targeted review and the Minister for Communications, Energy and Natural Resources recently commissioned the Sustainable Energy Authority of Ireland to invite proposals from suitably qualified organisations for the completion of a desk study of peer reviewed studies and other documents that examine the significance of noise related to onshore wind farms. The objective of the study is to obtain evidence upon which to evaluate the appropriateness of the existing guidelines in relation to noise impacts and if considered necessary suggest changes. It will take account of the following key contextual issues:

- The evolution of wind turbine technologies since the current Guidelines were published in 2006;
- Experience to date in the application of the current Guidelines
- Research relating to wind turbine noise issues since the current Guidelines were adopted
- Ireland's binding targets in relation to renewable energy update and penetration.

This study will form a key input into the review of the statutory guidelines. The study is expected to be completed by the end of the summer to allow preparation and publication of revised statutory guidelines in draft form. All statutory planning guidelines issue first in draft form for a public consultation over a period of a couple of months. The indicative timetable for the publication of the draft guidelines is Quarter 4 2013. The draft guidelines will – like all other new or revised guidelines – go out for extensive public consultation for a period of 6 weeks to 2 months, to allow for publication of the final guidelines in 2014. Once the consultation period is closed, the submissions received on the draft guidelines are considered and taken into account in the final form of the guidelines

I am writing to you to ask if the Dept. of Health has a national position on noise/shadow flicker from wind turbines from a health impacts perspective? If the query is not relevant to your area/section, I would be obliged if you could pass it on to the appropriate person in your Department for direct response.

We look forward to hearing from.

Regards

Miriam

Miriam Tiernan
Planning Section
Department of the Environment, Community and
Local Government
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Wexford

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Frank Gallagher - (DECLG)

From: Colette_Bonner@health.gov.ie
Sent: 11 November 2013 09:44
To: Frank Gallagher - (DECLG)
Subject: public health effects of wind turbines.
Attachments: heath effects of wid turbines.docx

Dear Frank ; This request was sent to me last week by CMO . Due to work commitments I have been only able to do a brief overview of the literature Tis evidence is based on Australian government National Healthand Medical research council (2009). I will update this at a later stage.

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Effects of Noise from Wind Turbines on Human Health

The health and well-being effects of noise on people can be classified into three broad categories:

1. subjective effects including annoyance, nuisance and dissatisfaction;
2. interference with activities such as speech, sleep and learning; and
3. physiological effects such as anxiety, tinnitus or hearing loss (Rogers, Manwell & Wright, 2006).

Many factors can influence the way noise from wind turbines is perceived. The aforementioned study also found that being able to see wind turbines from one's residence increased not just the odds of perceiving the sound, but also the odds of being annoyed, suggesting a multimodal effect of the audible and visual exposure from the same source leading to an enhancement of the negative appraisal of the noise by the visual stimuli (Pedersen & Persson Waye, 2007). Another study of residents living in the vicinity of wind farms in the Netherlands found that annoyance was strongly correlated with a negative attitude toward the visual impact of wind turbines on the landscape. The study also concluded that people who benefit economically from wind turbines were less likely to report noise annoyance, despite exposure to similar sound levels as those people who were not economically benefiting (Pedersen et al, 2009).

In addition to audible noise, concerns have been raised about infrasound from wind farms and health effects. It has been noted that the effects of low frequency infrasound (less than 20Hz) on humans are not well understood (NRC, 2007). However, as discussed above, several authors have suggested that low level frequency noise or infrasound emitted by wind turbines is minimal and of no consequence (Leventhall, 2006; Jakobsen, 2005). Further, numerous reports have concluded that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines (DTI, 2006; CanWEA, 2009; Chatham-Kent Public Health Unit, 2008; WHO, 2004; EPHC, 2009; HGC Engineering, 2007). In summary:

- 'There is no reliable evidence that infrasounds below the hearing threshold produce physiological or psychological effects' (Berglund & Lindvall 1995).
- Infrasound associated with modern wind turbines is not a source which will result in noise levels which may be injurious to the health of a wind farm neighbour (DTI, 2006).
- Findings clearly show that there is no peer-reviewed scientific evidence indicating that wind turbines have an adverse impact on human health (CanWEA, 2009).
- Sound from wind turbines does not pose a risk of hearing loss or any other adverse health effects in humans. Subaudible, low frequency sounds and infrasound from wind turbines do not present a risk to human health (Colby, et al 2009).
- The Chatham-Kent Public Health Unit (Ontario, Canada) reviewed the current literature regarding the known health impacts of wind turbines in order to make an evidence-based decision. Their report concluded that current evidence failed to demonstrate a health concern associated with wind turbines. 'In summary, as long as the Ministry of Environment Guidelines for location criteria of wind farms are followed ... there will be negligible adverse health impacts on Chatham-Kent citizens. Although opposition to wind farms on aesthetic grounds is a legitimate point of view, opposition to wind farms on the basis of potential adverse health consequences is not justified by the evidence' (Chatham-Kent Public Health Unit, 2008).
- Wind energy is associated with fewer health effects than other forms of traditional energy generation and in fact will have positive health benefits (WHO, 2004).

- ‘There are, at present, very few published and scientifically-validated cases of an SACs of wind farm noise emission being problematic … the extent of reliable published material does not, at this stage, warrant inclusion of SACs … into the noise impact assessment planning stage (EPHC, 2009).
- While a great deal of discussion about infrasound in connection with wind turbine generators exists in the media there is no verifiable evidence for infrasound and production by modern turbines (HGC Engineering, 2007).

The opposing view is that noise from wind turbines produces a cluster of symptoms which has been termed Wind Turbine Syndrome (WTS). The main proponent of WTS is a US based paediatrician, Dr Pierpont, who has released a book ‘Wind Turbine Syndrome: A report on a Natural Experiment, presents case studies explaining WTS symptoms in relation to infrasound and low frequency noise. Dr Pierpont’s assertions are yet to be published in a peer-reviewed journal, and have been heavily criticised by acoustic specialists. Based on current evidence, it can be concluded that wind turbines do not pose a threat to health if planning guidelines are followed.

Effects of Shadow Flicker and Blade Glint on Human Health

Shadow flicker from wind turbines that interrupts sunlight at flash frequencies greater than 3Hz has the potential to provoke photosensitive seizures (Harding, Harding & Wilkins, 2008). As such it is recommended that to circumvent potential health effects of shadow flicker wind turbines should only be installed if flicker frequency remains below 2.5 Hz under all conditions (Harding, Harding & Wilkins, 2008).

According to the EPHC (2009) there is negligible risk of seizures being caused by modern wind turbines for the following reasons:

- less than 0.5% of the population are subject to epilepsy at any one time, and of these, approximately 5% are susceptible to strobing light;
- Most commonly (96% of the time), those that are susceptible to strobe lighting are affected by frequencies in excess of 8 Hz and the remainder are affected by frequencies in excess of 2.5 Hz. Conventional horizontal axis wind turbines cause shadow flicker at frequencies of around 1 Hz or less;
- alignment of three or more conventional horizontal axis wind turbines could cause shadow flicker frequencies in excess of 2.5 Hz; however, this would require a particularly unlikely turbine configuration.

In summary, the evidence on shadow flicker does not support a health concern (Chatham-Kent Public Health Unit, 2008) as the chance of conventional horizontal axis wind turbines causing an epileptic seizure for an individual experiencing shadow flicker is less than 1 in 10 million (EPHC, 2009). As with noise, the main impact associated with shadow flicker from wind turbines is annoyance.

In regards to blade glint, manufacturers of all major wind turbine blades coat their blades with a low reflectivity treatment which prevents reflective glint from the surface of the blade. According to the Environment Protection and Heritage Council (EPHC) the risk of blade glint from modern wind turbines is considered to be very low (EPHC, 2009).

In conclusion, wind turbines do not represent a threat to public health. However there is a consistent cluster of symptoms related to wind turbine syndrome which occurs in a number of people in the vicinity of industrial wind turbines. There are specific risk factors for this

syndrome and people with these risk factors experience symptoms. These people must be treated appropriately and sensitively as these symptoms can be very debilitating.

Dr. Colette Bonner
November 2013



23 December 2013

Mr Frank Gallagher,
Planning Section,
Department of the Environment, Community and Local Government,
Custom House,
Dublin 2.

Dear Mr Gallagher,

I refer to your letter of 25 October 2013 in relation to wind turbines and health including noise/shadow flicker.

The Deputy Chief Medical Officer (DCMO) conducted a literature review with regard to the *Effects of Noise from Wind Turbines on Human Health*. This review also considered the effect of shadow flicker and blade glint on human health.

In her review, the DCMO concluded that:

"wind turbines do not represent a threat to public health. However there is a consistent cluster of symptoms related to wind turbine syndrome which occurs in a number of people in the vicinity of industrial wind turbines. There are specific risk factors for this syndrome and people with these risk factors experience symptoms. These people must be treated appropriately and sensitively as these symptoms can be very debilitating".

I understand that the DCMO has also discussed the matter with you and has suggested that you might consider engaging experts in this field along the lines of the approach adopted when the issue of the health effect of electromagnetic fields was being considered by your Department. In that case, an expert group was established and they reported on the matter in 2007.

Yours sincerely,



Gregory Canning

Food and Environmental Health Unit

