Submission to Senate Standing Committees on Environment and Communications

Renewable Energy (Electricity) Amendment (Excessive Noise from Wind Farms) Bill 2012

by

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I support these proposed amendments to the Renewable Energy Act, because of the need for transparency about the noise and wind mast data, and for serious consequences for breaches of noise guidelines (non payment of RECS) if wind farm owners break the rules. I live on a farm near Cootamundra, and there are a number of proposed wind farm developments in our area, which will impact my family and friends if they go ahead.

There is a growing body of published research in this area, which I hope will be of use in supporting these proposed amendments. I have listed a number of research publications below. In addition the Acoustic Ecology Institute publishes a well balanced report on wind farm noise each year, as well as providing pdf files of a number of key papers on wind farm noise:

http://www.acousticecology.org/wind/

Thank you for taking the time to consider this submission.

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Appelqvist, P., and Almgren, M., 2011. Wind turbine noise in sheltered dwelling areas. Fourth International Meeting on Wind Turbine Noise, Rome, Italy, 12-14 April, 2011

Bakker, H., and Rapley, B., 2010. Sound characteristics of multiple turbines, pp. 233-258 of Rapley and Bakker (eds), 2010

Bengtsson, J., Persson Waye, K., and Kjellberg, A., 2004. Sound characteristics in low frequency noise and their relevance for the perception of pleasantness. *Acta Acoustica* (2004) 90: 171-180

Dickinson, P. J., 2010. Sounds from wind turbines: theory, practice, assumptions and reality, pp. 181-205 of Rapley and Bakker (eds), 2010

Frank H. Brittain, F & Hale, E (2008) "*Some limitations of ray-tracing software for predicting community noise from industrial facilities*", 2008 International Noise Conference(Noise-Con), Dearborn, Michigan. Available on line at :

http://www.windaction.org/documents/18087

This paper covers limitations and problems with the sound propagation standard (ISO 9613-2). This standard model is used for noise assessment studies in the NSW environmental assessments. **A key point with relation to wind energy developments is that the ISO 9613-2 model can give no estimation of its own accuracy beyond 1km, yet it is routinely used for distances exceeding 1km.**

Hanning, C and Nissenbaum, M. (2011) Selection of outcome measures in assessing sleep disturbance from wind turbine noise. Fourth International Conference on Wind Turbine Noise.

Harrison, J. P., 2011. Wind turbine noise. *Bulletin of Science, Technology & Society*, 2011, 31: 256-261

Kamperman, P & James, R (2008) "*Simple guidelines for siting wind turbines to prevent health risks*", 2008 International Noise Conference (Noise-Con), Dearborn, Michigan. Available on line at :

http://www.windaction.org/documents/17095

Reviews sound studies conducted by consultants for governments, wind turbine owners, and local residents for a number of sites with known health or annoyance problems. The purpose is to determine if a set of simple guidelines using dBA and dBC sound levels can serve as the 'safe' siting guidelines.

Keith, S. E., D. S. Michaud, and S. H. P. Bly. 2008. A proposal for evaluating the potential health effects of wind turbine noise for projects under the Canadian Environmental Assessment Act. Journal of Low Frequency Noise, Vibration and Active Control, 27 (4): 253-265.

McMurtry et.al. (2009) "*Community-based health survey, Ontario*" Report for Wind Concerns Ontario. Available on line at :

http://www.windaction.org/documents/22261

"This community based surveillance activity was conducted under the guidance of Dr. Robert McMurtry, the Former Dean of Medicine at the University of Western Ontario. The health survey revealed that out of 76 respondents, 53 people now living near different wind power facilities in Ontario reported that industrial wind turbines were having a significant negative impact on their lives. The adverse effects range from headaches and sleep disturbance to tinnitus (ringing in the ear) and depression."

Minnesota Department of Health Environmental Health Division (2009) "*Public Health Impacts of Wind Turbines*" Report requested by Minnesota Department of Commerce Office of Energy Security May 22, 2009. Available on line at :

http://www.windaction.org/documents/21436

Health report "white paper" evaluating possible health effects associated with low frequency vibrations and sound arising from large wind energy conversion systems (LWECS).

Northern Maine Medical Center (2009) "*Health Concerns and the Need for Careful Siting of Wind Turbines*" Press Release March 4, 2009

Medical Staff of Northern Maine Medical Center unanimously approved this press release and requested a moratorium on "wind farm" developments. Three excerpts from this press release :

"We echo the concerns of the Medical Staff of Rumford Community Hospital as regards an increasing body of literature and reports from Canada, the USA, and particularly from Europe suggesting that the deployment of industrial wind facilities in close proximity to places where people live, work or attend schools results in negative health effects, including and especially sleep deprivation and stress."

"These effects arise not only from audible noise frequencies but also from persistent inaudible low frequency noise waves of a cyclical nature which are felt, but not heard. There are a growing number of scientific observations and studies suggesting that people living up to 2 miles away from these industrial wind farms may be affected."

"In light of these growing, serious medical concerns, we propose a moratorium on the building of any such "wind farms" until more research is done on the health impact that such facilities will have on the communities surrounding such technology. These communities and the Maine DEP and Health Services must be allowed time to study and learn from the European and Canadian experiences, as well as from the many affected families in Mars Hill, Maine, and put into place appropriate regulationprior to expanding the wind industry in the State of Maine."

Pedersen, E., and Halmstad, H. I. 2003. Noise annoyance from wind turbines – a review. Swedish Environmental Protection Agency, Report 5308.

Pedersen, E. and Persson Waye, K. 2008. Wind turbines – low level noise sources interfering with restoration? Environmental Research Letters, 3: 1-5.

Pedersen, E., and Persson Waye, K. 2007. Wind turbine noise, annoyance and selfreported health and wellbeing in different living environments. Occup. Environ. Med. 64: 480-486.

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Pedersen, E, (2007) "*Human response to wind turbine noise - perception, annoyance and moderating factors*", Doctoral Thesis (Medicine) Inst of Medicine. Dept of Public Health and Community Medicine, Göteborg University. Sahlgrenska Academy, Sweden. Available on line at :

http://gupea.ub.gu.se/dspace/handle/2077/4431

Rapley, B., and Bakker, H. (eds), 2010. *Sound, Noise, Flicker and the Human Perception of Wind Farm Activity*, Atkinson and Rapley Consulting Ltd (Palmerston North, New Zealand) in association with Noise Measurement Services Pty Ltd (NMS) (Brisbane, Australia), 2010

Ring, S., and Webb, B., 2012. Wind farm noise and private nuisance: a return to common sense. *Journal of Planning & Environment Law* (2012) 892

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Shepherd, D., McBride, D., Welch, D., Dirks, K. N., & Hill, E. M. (2011). Evaluating the impact of wind turbine noise on health-related quality of life. *Noise and Health*, *13*(54), 333.

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on Acoustics, Auckland, New Zealand.

Swinbanks, M.A. (2011) The audibility of low frequency wind turbine noise. Fourth International Conference on Wind Turbine Noise.

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van den Berg, G. P., 2004a. Do wind turbines produce significant low frequency sound levels? 11th International Meeting on Low Frequency Noise and Vibration and its Control, Maastricht, The Netherlands, August 30-September 1, 2004

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http://dissertations.ub.rug.nl/faculties/science/2006/g.p.van.den.berg/

van den Berg, G. P., 2007. Wind profiles over complex terrain. Second International Meeting on Wind Turbine Noise, Lyon, France, September 20-21, 2007

Van den Berg, F., Pedersen E., Bouma, J., and R. Bakker. 2008. Project WINDFARMperception. Visual and acoustic impact of wind turbine farms on residents. FP6-2005-Science-and-Society-20 Project no. 044628: 1-99

The research of van den Berg shows that there are significantly higher levels of noise pollution at night than are experienced in the daytime, and the effects of complex terrain such as hills are different to flat terrain. Sound levels can be up to 15dB higher at night relative to the same reference wind speed in daytime. These papers also discuss the flawed methodology of wind induced microphone noise during background sound monitoring.