

**Senate Community Affairs References Committee**  
**ANSWERS TO QUESTIONS ON NOTICE - CSIRO**  
Inquiry Hearing: The Social and Economic Impact of Rural Wind Farms  
Friday, 25 March 2011

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**REFERENCE:** Question on Notice, Hansard, 25 March 2011, pages CA26-27

**Dr Ashworth**—We do not normally do that kind of research.

**Senator FIELDING**—So the CSIRO has not done that type of research before when there has been a question mark about adverse health effects from other technology?

**Dr Ashworth**—I am just responding to the question about whether I am aware of any other medical research. As a general rule, my understanding is that at CSIRO we do not do medical research. We have a preventative health flagship, but I am not across how they decide priorities and I am really not familiar with other examples. I could take that on notice if there has been some of it.

**Senator FIELDING**—I think there are other technologies where you have had some say on whether there is adverse impacts on humans from technology. That is my opinion, but I am happy for you to confirm or deny that.

**ANSWER**

CSIRO has not conducted any original research on the health impacts of wind farms.

**REFERENCE:** Question on Notice, Hansard, 25 March 2011, page CA29

**Senator FIELDING**—I understand that the CSIRO has developed a smart load system that reduces the need for large scale storage of energy and that this technology has been provided to the wind energy companies. Is that right?

**Dr Ashworth**—I would not be able to comment on that as a social scientist, but I could take that on notice.

**Senator FIELDING**—You may take on notice: has the CSIRO developed a smart load system—I believe it has—which is being provided to the wind energy companies? Has the CSIRO got any vested commercial interest in seeing wind energy continue? Is the CSIRO providing it on a commercial basis? I suppose you cannot answer that because you do not know whether you are. You can take that on notice.

**ANSWER**

CSIRO is developing an advanced battery system and smart control algorithms that can potentially smooth the variable electrical output from intermittent renewable energy technologies such as solar and wind, and thereby enable the capacity to store energy. This CSIRO technology is currently being applied to wind turbines and wind farms. For wind, the current storage capacity is relatively small compared to the wind turbine or wind farm output and only provides short periods of storage. However, the benefit of the technology being developed by CSIRO is that smoother electrical output can result in a greater predictability of electricity supply from wind generators, and thus can provide a return on investment for the cost of storage.

An Australian company, Ecoult, is demonstrating CSIRO's technology at a small wind farm at Hampton in NSW under the Federal Government's Advanced Energy Storage Technology program. The technology is currently under evaluation for its long term economic potential. CSIRO is a subcontractor to Ecoult to provide research and development expertise related to the demonstration of this technology. Ecoult was originally a spin out company originating from CSIRO's advanced battery program but CSIRO does not maintain a shareholding in Ecoult. The international company East Penn Manufacturing (USA) now owns Ecoult.

CSIRO does not have a vested interest in seeing wind energy continue.

CSIRO believes that Australia's low carbon energy future will require multiple energy technologies and thus conducts research into a range of low emissions energy technologies, including solar thermal, geothermal, wind, and low emissions fossil fuels including gas and carbon capture and storage.

**REFERENCE:** Question on Notice, Hansard, 25 March 2011, page CA29

**Senator FIELDING**—I would be very interested to know whether the CSIRO can take us through the differences between measuring dBA and dBC. You can take that on notice. I will leave it there for the moment.

#### **ANSWER**

As described in the UNSW document “dB: What is a decibel?” (2010), the decibel (dB) is used to measure sound level:

“Not all sound pressures are equally loud. This is because the human ear does not respond equally to all frequencies: we are much more sensitive to sounds in the frequency range of about 1 kHz to 4 kHz (1000 to 4000 vibrations per second) than to very low or high frequency sounds. For this reason, sound meters are usually fitted with a filter whose response to frequency is a bit like that of the human ear.

#### ***dBA***

If the “A” weighting filter is used, the sound pressure level is given in units of dB(A) or dBA. Sound pressure level on the dBA scale is easy to measure and is therefore widely used... (but) using this filter, the sound level meter filter is less sensitive to very high and very low frequencies.

#### ***dBC***

The C weighting scale is practically linear over several octaves and is thus suitable for subjective measurements only for very high sound levels. Measurements made on this scale are expressed as dBC. There is also a rarely used B weighting scale, intermediate between A and C.”

#### ***Reference:***

UNSW (2010), dB: What is a decibel?, School of Physics, University of NSW, Sydney, <http://www.animations.physics.unsw.edu.au/jw/dB.htm> (accessed 8/4/11).

**REFERENCE:** Question on Notice, Hansard, 25 March 2011, pages CA31-32

**Senator ADAMS**—It was. You have big companies running wind farms and then you have a little neighbour who is obviously having problems from being too close. The turbines are being built probably a lot closer than they should be and they are having effects from that. What guidelines, policy or even legislation is going to force that particular company to pay X, Y or Z compensation?

**Dr Ashworth**—From my perspective, the work that we do helps to inform those sorts of things. We could easily provide the advice. As to making the recommendations, from my understanding that is probably outside of my area, but the things that we find would be available and could be incorporated.

**Senator ADAMS**—The reason that I ask that question is that it came up in your conclusion. If you have a conclusion with a list of things then that is obviously something that is fairly important. With noise, I have been involved with the aircraft noise committee as well and people living in rural areas and up in the hills, especially in Perth where I come from, have made comments, ‘This is as quiet as a quiet bedroom’, and all the rest of it. When you are in an area that is probably elevated and with valleys, on really still nights it is very different to living within the city where there is noise all the time, just a continual noise that everyone gets used to. When something is impacting on a very quiet area it is fine to say that you are citing the NHMRC report, but have you done any work in any other area rather than just the graph that they have put out?

**Dr Hall**—Is the question about work on other technologies?

**Senator ADAMS**—No, it is on noise. You have one thing here. You are citing the NHMRC report. I am wondering whether you have done any other investigative work or talked to anyone else about the noise or are you just relying particularly on what they have said?

**Dr Hall**—Just to clarify, is your question specifically about wind turbine noise?

**Senator ADAMS**—It is about wind turbine noise, but it is about the noise that we have there as ‘a quiet bedroom’, and then the wind turbine and then the other issues. It is just that you have referred to that. I just wondered if you had any other research papers where you have been able to determine that result.

**Dr Hall**—Yes. In the paragraph directly following that reference to the decibel noise we mentioned a peer review document from Gipe that does not try to measure the noise but identifies that noise inputs are important, whether they are linked with health impacts or not, because there are issues around perceived tranquillity. I will read that out.

*The perceived tranquillity of the local landscape for the local population is often highly valued. The introduction of a new sound from which the surrounding residents receive no direct benefit heavily impacts on their acceptance and support of that technology.*

**Senator ADAMS**—Do you have any other studies that you could quote about the actual noise levels from a wind turbine?

**Dr Hall**—The final document that we will publish will have much more on this. This is just a short submission that we made to you in the time available with the research that we had available. The public document will have more on this aspect.

**Senator ADAMS**—Can you come back to the committee on notice with some evidence of the noise levels and what you can compare them with?

**Dr Hall**—Yes.

## ANSWER

The South Australian Environment Protection Authority’s Environmental Noise Guidelines for wind farms (2003) recommends that the noise level from a wind farm should not exceed

an equivalent continuous noise level (LAeq,10 minutes) of 35dB(A), or the background noise level by more than 5dB(A), whichever is the greater, for each integer wind speed at which the turbine operates. This standard has been found to be among the most stringent in the world (NSW Govt, 2011, p.5).

A comparison by the NHMRC (2010) found the noise contribution from a ten-turbine wind farm measured at a distance of 350m (35-45 dbA) placed it between the noise level of a quiet bedroom (35 dbA) and a car travelling at 64 km/h (55 dbA).

*References:*

NSW Government (2011), Submission from NSW Government, Senate Inquiry into social and Economic Impact of Rural Wind Farms, Federal Parliament, Canberra.

NHMRC (2010), *Wind Turbines and Health- Public Statement*, National Health and Medical Research Council, Canberra, <http://www.nhmrc.gov.au> (accessed 25/1/11).

**REFERENCE:** Question on Notice, Hansard, 25 March 2011, pages CA33

**Senator CAROL BROWN**—You continue: ‘There is currently no evidence positively linking noise impacts and adverse health effects, the majority of property sales do not show any reductions in value after wind farm installation... In that part, particularly, can you provide us with that evidence? I am assuming that was from the New South Wales Valuer General’s report?’

**Dr Hall**—I would like to clarify the question. Are you asking about property values?

**Senator CAROL BROWN**—I am asking what it actually showed. You reviewed some research and I am just wondering what it actually showed?

**Dr Hall**—Just to clarify, the conclusion section is summarising the literature cited in the document.

**Senator CAROL BROWN**—Yes, that is right.

**Dr Hall**—We cite two documents. One is from the Valuer General from New South Wales and Henderson and Horning, who are real estate valuers, also based in New South Wales.

**Senator CAROL BROWN**—Are you able to give me some information on what it found? It says that it does not show any reduction, but can you expand further on that short statement?

**Dr Ashworth**—I will read out page 5 in the first paragraph of the New South Wales Valuer General’s report. It looked at 45 properties near six wind farms in Australia and states:  
*Of these, 40 sales did not show any reductions in value. Of the five properties that received lower than expected sale prices, further work was recommended to confirm the extent to which these were due to the wind farm. Additionally, no reductions in sale price were evident for properties located in townships with views of the wind farm.*

That is a 2009 document.

**Dr Hall**—In that document there is a literature review of many land property value assessments that have been done internationally, so that may be of interest to the committee. That goes right back from Denmark in 1999.

**Senator CAROL BROWN**—Do we have that document?

**CHAIR**—No, we do not have that document.

**Senator CAROL BROWN**—Can you get that document?

**Dr Ashworth**—Yes.

## ANSWER

An assessment of the impact of wind farms on surrounding land values in Australia was prepared for the NSW Valuer General (NSW Dept Lands, 2009). This assessment analysed property sales transaction data for 45 properties near six wind farms in Australia. Of these, forty sales did not show any reductions in value. Of the five properties that received lower than expected sale prices, further work was recommended to confirm the extent to which these were due to the wind farm. Additionally, no reductions in sale price were evident for properties located in townships with views of the wind farm (NSW Dept Lands, 2009, p.2).

The NSW study also presented findings from similar assessments in Denmark, the United Kingdom and the United States. The most comprehensive of these assessments found no statistical evidence of reductions in value associated with the development of a wind farm (NSW Dept Lands, 2009, p.3). Regarding the Danish research, it stated “One of the earliest studies that investigated the impacts of wind farms on property prices was conducted by Jørgensen (1996) in Denmark. The impact of wind farms on property sale transaction prices in 102 locations were analysed ... Jørgensen (1996) found that, on average, properties located close to a wind turbine sold for 16,200 DKK (approximately \$3,700 AUD) less than those located further afield. Furthermore, on average properties located close to 12 or more wind turbines sold for 94,000 DKK (approximately \$21,600 AUD) less than those located further afield. However, as noted by Sims and Dent (2007) the impact overall was relatively small and some of the results were not statistically significant” (in NSW Dept Lands, 2009, p.6).

### *References:*

Jørgensen, J. (1996) “Social Assessment of Wind Power: Visual; Effect and Noise from windmills – Quantifying and Valuation”, AKF April 1996.

NSW Department of Lands (2009), *Preliminary Assessment of the Impact of Wind Farms on Surrounding Land Values in Australia*, prepared for the NSW Valuer General by PRP Valuers and Consultants (Ref M.6777), Sydney. [www.lpma.nsw.gov.au](http://www.lpma.nsw.gov.au) (accessed 24/11/10).