Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Environment and Energy portfolio

Question No: 205

Hearing: Supplementary Budget Estimates

Outcome: Outcome 2

Program: International Climate Change and Energy Innovation Division (ICCEID)

Topic: Advice on noise impact provided to the Independent Scientific Committee

Hansard Page: n/a

Question Date: 28 October 2016

Question Type: Written

Senator Back, Chris asked:

Referring to QON 9, dated 5 May 2016 which asked about the increase in noise impact from an increase in wind turbine size and referred to the Moller and Pederson study, the answer given referred to both preliminary advice and subsequent advice provided by the Independent Scientific Committee. Will you please provide a copy of the advice to the Committee?

Answer:

The advice provided to the National Wind Farm Commissioner by the Chair of the Independent Scientific Committee on Wind Turbines in relation to the Moller and Pederson study is reproduced below:

"The answer to Senator Back's question for individual wind turbines based on the paper [1] that he referenced is yes, higher power output wind turbines do individually emit more sound power, do individually have a larger noise footprint on the surrounding landscape and do have a lower frequency sound spectrum. Senator Back's more relevant question is do wind farms with larger wind turbines "produce more noise and have a larger footprint on the surrounding landscape" and "have an adverse effect on the overall noise impact". To be more specific the question is whether the wind turbine sound level limits will be exceeded over a bigger area for the same installed electrical output capacity if larger electrical output capacity wind turbines are installed. The answer is probably not.

Assume initially that the wind turbines are far enough apart so that the areas where the wind turbine sound level limits will be exceeded for each individual wind turbine do not overlap and so that only the nearest wind turbine contributes significantly to the sound level. If the sound power increases more slowly than the electrical output power then the total area will be smaller. If the sound power increases faster than the electrical output power then the total area will be bigger. If the sound power increases at the same rate as the electrical output power then the total area will be the same.

In figure 1 of [1] the straight line of best fit (thin black line) increases more slowly if all the wind turbines are included and the total area is smaller. If the four smallest wind turbines are excluded, the straight line of best fit (thick black line) increases faster and the total area is larger. The second top paragraph of the left hand column on page 3738 of [1] says that this faster increase is not statistically significantly different from the same rate of increase and hence the areas are not statistically significantly different. Thus the areas are probably the same.

The same argument would apply if one very large wind turbine produced the total electrical output of the wind farm.

In practice, the answer will depend on the exact spacing of the small and large electrical output wind turbines. However, the best general estimate that can be made is no change of area.

[1] Henrik Møller and Christian Sejer Pedersen (2011). Low-frequency noise from large wind turbines. Journal of the Acoustical Society of America 129(6), 3727-3744.

John Davy, Chair of the Independent Scientific Committee on Wind Turbines

Monday 9 May 2016"