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## **Ministeren bagatelliserer støjgener**

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# MINISTER DOWNPLAYS NOISE NUISANCE

**Pretty picture.** It is to a considerable degree a pretty picture the Minister has painted of the noise from giant wind turbines. The neighbours lose out. The noise limits are neither tough nor binding. Maybe it is time for a service check?

*Feature article by Professor Henrik Møller, associate professor Christian Sejer Pedersen and research assistant, M.Sc. Steffen Pedersen, Aalborg University, Denmark, brought by Berlingske Tidende October 9<sup>th</sup> 2012.*

At present, wind turbine projects are in focus throughout the entire country. Many of the projects are met with resistance from the future neighbours who fear noise nuisance among other things. Feelings often run high and the people behind the projects attempt to cool the temperature by emphasizing that they intend to follow all the rules. Although this apparently calms many local politicians, it is an empty gesture towards the neighbours, since the rules have to be followed at any rate. And the question is, is this sufficient?

Minister for the Environment, Ida Auken, speaks of the world's toughest rules, tougher than for any other industry, and of "binding" limits that the authorities zealously see to are being respected – at least that is the impression given. The wind turbine industry, its organizations, information offices, spin doctors and employed correspondence columnists all chant the same tune. But the reality is different.

We have earlier pointed out that the new rules about low frequency noise from wind turbines are inadequate because the noise is not measured in the neighbours' houses, but is estimated using a defective method. (Feature article in Berlingske Tidende, June 15<sup>th</sup>, 2011). At that time the rules were only a proposal, but in spite of our (and many others') objections nothing whatsoever was corrected before the final executive order that became effective January 1<sup>st</sup>, 2012. That our objections were justified can be seen from the fact that measurements in the new and well-insulated house of a noise affected neighbour showed low frequency noise 5 decibel above the limit, even on a day without much wind. Control measurements of the noise emission from the turbines had shown that all the rules – also the new ones - had been complied with.

The rules for ordinary noise have also been criticized, and Minister for the Environment, Ida Auken, has in no less than two consultations had to stand up for the rules to the MP's Health Committee. On both occasions we have cringed at the Minister's explanations. Probably no one expects that a minister has read the scientific literature, however, one must require that her Government officials have studied the matter thoroughly and have seen to it that the minister can give a satisfactory and objective account. This was obviously not the case at any of the mentioned occasions. And the Government officials present provided little help for the Minister.

The main point of view in the Minister's explanation is that only very few will experience noise nuisance from wind turbines if the current rules for noise are respected, namely not more than 4% of the neighbours in a residential area where the noise limit is 39 decibel at a wind speed of 8 m/s, and not more than 11% in open land where the limit is 44 decibel.

These figures were claimed to come from a Dutch study. This, however, is not correct. The figures actually come from a compilation of results from two Swedish and one Dutch study. A small foot fault that one will forgive a busy minister.

However, it is worse that the minister's figures do not cover the real extent of the noise nuisance at all, but only show the tip of the iceberg. They only include the neighbours that are bothered the most of all. If one reads the studies properly, one will understand that the neighbours could indicate three extents of nuisance from the turbine noise: 1) very annoyed, 2) rather annoyed, and 3) slightly annoyed. The Minister's figures are only based on the first group, i.e. the neighbours that are annoyed the most. If the second group is included, namely the neighbours that are rather annoyed, the figures will approximately double.

The Minister did not mention, either, that the figures only include nuisance indoors. Lots of the complaints that we hear concerning wind turbine noise are about nuisance outside, and many neighbours claim that they have given up using their garden because of the noise. If the nuisance outside is included – and, for other sources, usually one does not distinguish between indoor and outside nuisance – the figures will roughly double again.

Thus the correct information is that 22% would be rather or very annoyed if they live at the 39 decibel limit for residential areas, and no less than 42% would be rather or very annoyed if they live at the 44 decibel limit for homes in open land.

Let us repeat: the 4% annoyed neighbours are hence not 4 but 22%, and the 11% are not 11 but 42%! And then we have completely ignored the very large category of neighbours that state that they are annoyed but only slightly. And because of the way the figures have been calculated, neighbours that are only annoyed indoors have not been included.

The Minister also explained that the nuisance only occurs when the wind blows 8 m/s or more and the neighbour is downwind to the turbines, which is obviously the case only a limited part of the time. However, the Minister and her Government officials have completely misunderstood the Swedish and Dutch studies. Their results do not show the instantaneous nuisance just when the wind speed is 8 m/s. On the contrary they show the general nuisance during a long period of time when one lives where the estimated noise at 8 m/s is at the mentioned decibel figures.

Thus the neighbours can easily be annoyed both at higher and lower wind speeds, and they can be annoyed during a short or a long period of time. One of the Swedish studies has included data about how often the persons are annoyed, and there are so many who answer "daily/almost daily" or "several times a week" that they correspond to most of the annoyed neighbours by far.

Finally the figures presuppose that the limits are actually being adhered to. In spite of the Minister's firm statement about the limits being binding, the Environmental Protection Agency claims that exceeding of the limit by up to 2 decibel is considered to be of minor significance and cannot result

in claims for reduction in noise or stopping the turbines. If the limit is 44 decibel, then the control measurements are thus allowed to show 46 decibel. Furthermore, an uncertainty of 2 decibel is assumed which means that in reality the noise can reach 48 decibel!

It is to a considerable degree a pretty picture the Minister has painted of the future prospects for the neighbours to the giant wind turbines. It is not only a small, sensitive group that will be annoyed by the noise, but a large part of the neighbours who live close to the noise limits. And it will not only be at rare intervals, but quite often - if not most of the time.

All in all one must say that the Minister for the Environment's officials seem to have great difficulty in reading and interpreting scientific results. A recent example of this is a report on noise from wind turbines during the night ordered by the Environmental Protection Agency at the company called Delta. The background for this report is that neighbours have thought for quite a while that wind turbines produce more noise during the night than during the day. According to Delta's report this is not true: the wind at the height of the wind turbines' blades is equally strong night and day, and the turbines produce equal noise. On the other hand, the wind at ground level usually falls in the evening; hence there is less background noise. Therefore the noise from the turbines is heard more clearly and can thereby be more annoying.

Lower wind speed at ground level means lower noise limits. In practice this is not effective, though, because the rules are designed in such a way that wind at ground level is not measured, but is calculated from the turbine's production of electricity. And the formula used applies to the wind conditions usually found during the daytime. Consequently, the noise a turbine is allowed to produce during the daytime when the wind is 8 m/s at ground level is also allowed during the night no matter that the wind at ground level may have fallen to 6 m/s or even less.

The Environmental Protection Agency's newsletter about Delta's report tells the whole story about the wind speed at different altitudes, but completely ignores that the consequence is that the noise limits are often not kept during the evening and the night. No wonder that this is difficult to understand and accept for the neighbours.

Again the neighbours lose out and must conclude that the noise limits of the executive order are neither tough nor binding. Maybe it is time for a service check?

*Translated by Hanne Hjort (some linguistic proposals by John Droz, jr., physicist).*