Northern Ireland Assembly

Committee for the Environment

OFFICIAL REPORT (Hansard)

Wind Energy Inquiry:
Mrs Ursula Walsh, University of Ulster

11 September 2014

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:
Ms Anna Lo (Chairperson)
Mrs Pam Cameron (Deputy Chairperson)
Mr Cathal Boylan
Mr Colum Eastwood
Mr Alban Maginness
Mr Ian McCrea
Mr Barry McElduff
Mr Ian Milne
Lord Morrow
Mrs Sandra Overend
Mr Peter Weir

Witnesses:
Mrs Ursula Walsh University of Ulster

The Chairperson: I welcome Mrs Ursula Walsh from the University of Ulster, who has been appointed as our special adviser on acoustics, and invite her to make a five- or 10-minute presentation to the Committee, after which members will have an opportunity to ask questions. Thank you very much for your hard work; you have done a very big piece of work.

Mrs Ursula Walsh (University of Ulster): Good afternoon. I want to give you a brief overview of my paper and, perhaps, explain a couple of terms, after which we can have a discussion.

Noise is quite complex. Sound becomes noise when it becomes unwanted. People's perceptions of noise are related not just to the volume of the noise but to its pitch or frequency and character. Two noises might be at the same volume, but one might be much more annoying than the other because of its character and fluctuations, which I will talk about. It also depends on the time of day. Obviously, if people's sleep is disturbed, it is much more annoying than it perhaps would be during the day.

There is a human reaction to the annoyance caused by wind turbine noise. Sometimes, people are more annoyed because they feel a lack of control or they have feelings of injustice that they are not being heard or believed. Therefore, there is a subjective element to it. However, some people's being more sensitive to noise than others has not been found so much with wind turbine noise.

Some of the general terms that you come across in all the noise guidance are not everyday terms, so the inquiry asked me to explain some of them. Leq is, more or less, the average sound. If you get all the sounds together, it is an average. L90, which is referred to extensively in the wind turbine guidance ETSU, is more or less the background noise remaining when you remove the noisiest

elements. It would not be your average noise; it would be the remaining noise. It would be low-level noise, about two decibels lower than Leq.

When you see those terms and there is a small subscript "A", as in LAeq, that "A" means that it has been adjusted, weighted. The "A" gives more weighting to high-frequency noise and removes decibels in low-frequency noise. In other words, it will give you a reading that makes higher-frequency noise more important. It diminishes low-frequency noise. That "A" weighting means that some pitches are enhanced and lower ones are diminished, if that is clear.

Noise comprises pressure waves and they spread out in the environment. They are affected by weather, so on still nights noise will travel better than on windy days. It also depends on the landscape. With distance, high frequencies and high pitches are absorbed in the atmosphere much more than low frequencies and low pitches.

If an airplane is going past you, for example, you will hear the low-frequency element; you will hear the drone. You will hear not high-pitched noises but low-pitches noises even though the noise, if you were beside the airplane, would have high and low frequencies. At a distance, you tend to hear the lower frequencies.

Wind turbine noise is mainly dominated by aerodynamic noise — the swish of the blades going round in the air — and most of the noise from wind turbines is that swishing. To some extent, it is unavoidable. It is the nature of the machine. You can get mechanical noise if there are faults, but we are mainly talking about aerodynamic noise, the swish. The recent designs of turbines have a better blade angle going into the air. It is like any newer, more modern machine; it would tend to be quieter than older machines. They have a better design. However, larger turbines are louder and have more low-frequency noise. So, the more modern ones are quieter, but the larger ones, of course, are going to be louder.

It is not a steady noise, like your fridge at home, and you may not notice it until it suddenly kicks off. A fridge makes is a steady noise and is not that noticeable. Wind turbine noise has a fluctuation. It goes up and down a little bit. The ETSU guidance, published in 1997, acknowledged there was some fluctuation, but bigger wind turbines have been found to have more fluctuations and more in the lower-frequency range.

The ETSU guidance relies very much on the British Standards Institution's BS 4142, which says that more emphasis should be put on the fluctuations. If a noise is not steady, you have to account for that. It is likely to be more annoying if it fluctuates. I am talking about amplitude modulation, which is up and down — non-steady because it is not steady. The standard says to take account of that and add in another five decibels for the annoyance as it is not a steady noise. When the ETSU guidance was published in 1997, it did not recognise the degree of fluctuations that we now know the larger machines are capable of. ETSU is the assessment and rating of noise from wind turbines. Our planning and policy statement refers to ETSU.

The evidence base has expanded a lot since the ETSU guidelines were published in 1997. A lot more is known about wind turbine noise and annoyance. Also since 1997, the World Health Organization has reduced its recommended indoor night-time noise from 35 decibels to 30 decibels. They reckon that for people not to have their sleep disturbed, it should be 30 decibels.

The ETSU guidance talks a lot about the L90 measure. As I mentioned, that is not the average sound level, it is the lower sound level. ETSU uses L90, the lower level, for both turbine noise and background noise. That is very unusual. All the other guidance that I have read and all the other standards use LAeq. They all use the average; so this is quite unusual for ETSU. When the ETSU guidance was written, it was recommended that it should be reviewed within two years; however, it has not been reviewed. Some of the people who actually wrote the ETSU guidance have subsequently published a paper saying that it might underestimate the noise. So, the people who wrote the ETSU guidance have reservations and reckon that it needs to be updated in the light of current knowledge.

Basically, the reason I think that the ETSU guidance should be revised — apart from the fact that its authors think so — is that the quieter the environment, the more disturbing the noise is. So, it is not necessarily about the actual noise level; it is about the difference between the background noise — what you are used to — and the source noise. It is the difference between the background noise level and the source, not necessarily the absolute, noise level. So, something in the centre of Belfast may not be very annoying, but if it were in the countryside the exact same noise would be annoying. That

is what the British standard says as well: it is the difference between the background noise and the source noise. ETSU refers to that; however, it then says that in low-noise environments you may not use that approach. So, I think that ETSU needs to be clarified: why it is usually the difference between the background noise and the actual wind noise, and why sometimes the background noise is not considered. That needs further explanation. ETSU needs to be updated with regard to the World Health Organization's changes, and more consideration needs to be given to those fluctuations.

Let me turn to some particular issues which you asked me about. Anecdotally, I have heard from several sources, although I do not have evidence, that Northern Ireland is in receipt of older wind turbines, refurbished from other countries. Three academic and professional sources have told me that Northern Ireland is getting refurbished wind turbines. Obviously, those turbines do not benefit from the more recent designs and they may show signs of wear and tear. For example, the blade may have indentations, holes or wear which make it noisier. Apparently, some websites that market reconditioned turbines highlight Northern Ireland as a potential market. I query why such turbines, which are perhaps no longer acceptable in other countries, are acceptable here. Other industries have to show use of best available technology with regard to noise. With refurbished turbines in use, I would query whether we are getting the best technology as defined in the report. Also, with regard to noise, it is a defence to prove use of best practicable means. Again, I think it would be worth looking into the refurbished, reconditioned turbines.

You were asking me in my brief whether the developer should carry out ongoing noise monitoring. My report states that that would identify any increases in noise and any increases beyond what was anticipated. Such noise could be identified and remedied, so I recommend ongoing monitoring by the developer.

You also ask me about setting planning conditions. It is very common for environmental health to advise the Planning Service on planning conditions with regard to noise. There are model planning conditions for noise in guidance provided by the Institute of Acoustics. Use of that would be common.

You also asked me about the environmental health profession's knowledge of acoustics and noise. My report says that there is a great deal of expertise in acoustics in Northern Ireland's environmental health profession. Many of them have the postgraduate diploma in acoustics, are members of the Institute of Acoustics and sit on the institute's advisory committees. However, even though there will be fewer and larger councils shortly in Northern Ireland, there is a considerable and time-consuming administrative and human resources burden due to commenting on planning applications on wind turbines. So, there is a burden on councils.

My report suggests that there should be a more strategic approach to wind turbine planning permission, rather than planning permission being granted on an ad hoc, case-by-case basis. There should be an overview and strategic approach to where we want turbines to be rather than those that pop up intermittently.

I think that we should refer to the Danish policy. In Denmark, there is the subsidy scheme for replacement of wind turbines as they become less efficient and, as I mentioned, noisier. Newer ones are less noisy. They replace wind turbines and have a replacement scheme. They are really going towards offshore, rather than onshore, wind turbines. They do acknowledge that there have been complaints in Denmark. Maybe we might not think that other countries complain about noise. They have a loss-of-value scheme for dwellings, so that, if your dwelling is badly affected by wind-turbine noise, there is a compensation scheme. There is an option to purchase at least 20%. So, if a wind turbine is being erected near your house, you have the option to purchase a portion of that turbine so that you will then have an economic interest in it. One of the reasons why people feel particularly aggrieved is when they feel that they have no control and that there is an injustice. We might benefit from the experiences of the Danish.

I was also asked to compare wind turbine noise to road traffic noise and other industrial noise. Wind turbine noise has been found to be more annoying than industrial and road traffic noise. At significant roads and industrial areas, the noise has to be mapped and action plans put in place. With road traffic noise, if a road is being significantly upgraded and your house is nearby, you can get money towards insulation and there is a compensation scheme in place. However, I would say that comparing wind turbine noise with industrial or road traffic noise is like apples and oranges because they are different characters. Road traffic noise tends to go down at night. Roads would not be as noisy at night. So, it is different.

In summary, the ETSU guidance actually permits louder noise at night than it does during the day. Again, anecdotally, I have been told that some operators actually increase their production of electricity at night when they are allowed to emit louder noise levels than during the day. That seems like another reason why the guidance could do with being reviewed and revised.

The Chairperson: Thank you, Ursula. There is certainly a lot of food for thought. That was very informative. You mentioned issues like ETSU-R-97's being quite out of date, needing to be reviewed and all of that, but this is the first time that I have heard about us using reconditioned turbines. Maybe that is something that we need to write to the Department about. What you are saying is anecdotal. To what extent do we know that we buy reconditioned turbines from others?

Mrs Walsh: I do not know.

The Chairperson: So, when developers make planning applications, do they have to tell the planners that they are for reconditioned turbines?

Mrs Walsh: As far as I know, they identify the make and model of the turbines.

The Chairperson: OK. So, the Department should know and be able to tell us how many what you would call "new turbines" are being installed here that are actually old turbines?

Mrs Walsh: Yes.

The Chairperson: That is something quite significant.

Mr Milne: You mentioned Denmark. Is it possible for us to get a more detailed report on how Denmark operates the system of renewable energies through wind?

Mrs Walsh: How Denmark operates what?

Mr Milne: You said that Denmark has moved away from turbines and more to offshore. Can we get a more detailed report on what you said regarding Denmark?

Mrs Walsh: I have a document here about wind turbines in Denmark. It is produced by the Danish Government and is on my references list. That document is available. It is quite a straightforward document. It is quite easy reading. It does not give the minute detail about how, for example, compensation schemes operate in practice. It does not go into great detail about Denmark's move towards offshore. I was in Denmark in the summer, and several people told me, "We're going offshore". However, when I looked it up, it did not exactly say that they were definitely and conclusively going offshore, but they were saying that this committee is committed more to a policy of offshore turbines.

Mr Milne: Here, we talk about community benefits, and I like the idea you mentioned that, in Denmark, if a wind turbine is put up beside you, you get maybe up to 20% of buy-in to that building. Here, communities are given a few pounds or pennies to buy them off. That is why I would like to see a more detailed document on what is happening in Denmark.

Mrs Walsh: As I said, there is that document. It is called 'Wind Turbines in Denmark', and it gives the main information about that but does not give the detail on exactly how those schemes work.

The Chairperson: We can ask Suzie in research to look into it. Suzie has produced a couple of research papers for us.

Mr Boylan: Ursula, thank you for your presentation. I was only signalling that I wanted to ask a question. Sorry about that.

The Chairperson: It was my fault. Ian puts his hand up higher.

Mr Boylan: There is a main point here that you have exposed. You brought up some good points on open space and how sound travels. Clearly, most of these are in the open countryside. Your main point is about the ETSU-R-97, which sounds like something out of a sci-fi movie. The point is that,

when people have been making presentations to this Committee, they have been saying to us that there have been issues. Clearly, you have exposed those people who have been through that process and said that there are problems with it. That leads me on to say that I know that we have good acoustic professionals here, but, if they are judging all of this, or refusing that, on that policy, which, clearly, does not seem to be fit for purpose, there is a challenge for us to ask more questions. Is it your view now that most of the information is leading us to be judging something on a policy or recommendations that are not fit for purpose and that Planning Service and whoever else is using ETSU-R-97 to gauge all of these decisions?

Mrs Walsh: I think ETSU needs to be reviewed and revised in view of the fact that the knowledge has changed a lot. There has been a lot more knowledge on wind turbine noise since then, and the World Health Organization has asked for particular consideration to be given to low-frequency noise. I think that there is more low-frequency noise in the larger turbines than in 1997, when turbines were not generally as large as they are now. They are getting bigger. I think that the guidance needs to be revised. As I said, ETSU refers to the British Standards Institution's BS4142, and it is being revised currently. Currently, it is being said that maybe more weight needs to be given to these fluctuations and tones, so ETSU would benefit from the upcoming revision of the British Standard.

Mr Boylan: Where is that element of it — the review? Is it soon? The reason I ask you that is because there are going to be a number of decisions over the next twelve months or the next two approvals. There could be a retrospective challenge to whatever system people want to use. I would safely say now that, at this moment in time, given the evidence that you have brought to us in relation to ETSU-R-97, there could be challenges to those approvals that have already taken place because the guidance was not actually fit for purpose. Is that a fair assumption? Where are we in terms of the new review? There are going to be new decisions made or new approvals given over the next 12 months, or maybe more than that, before the new figures are actually in place.

Mrs Walsh: It does not give enough weighting to the fluctuations and the amplitude modulation. It does not give enough significance to the annoyance level of that.

Mr Boylan: So, basically, we as a Committee need to ask questions about approvals. It is not really fit for purpose, given what we have heard today.

The Chairperson: Do you know why? As you said, it was meant to be reviewed after two years. Why is it still not being reviewed 17 years on? What is the reason for not reviewing it?

Mrs Walsh: I do not know. The Institute of Acoustics did bring out a guide to ETSU but it was outside the remit of the institute to look at noise levels and noise limits. Further guidance on it has been produced, but certain core issues were not addressed because it was outside the remit of the review committee.

The Chairperson: Thank you very much. That was a lot of information. Your issue about taking a strategic approach has been given to us over and over by planning personnel. There are just too many ad hoc applications, with single turbines everywhere. Thank you very much indeed.