

Guidance for assessing and rating wind turbine noise

Consultation response

The **Institution of Environmental Sciences** (the IES) is at the forefront of uniting the environmental sciences around a shared goal: to work with speed, vision and expertise to solve the world's most pressing environmental challenges, together.

As the global professional membership body for environmental scientists, we support a diverse network of professionals all over the world – and at every stage of their education and careers – to connect, develop, progress and inspire.

The IES represents the voices of environmental professionals, sharing insights from the front lines of work with the environment. The interdisciplinary background of the IES family makes it particularly well-placed to address interconnected environmental challenges such as how climate change, energy, and noise interact.

The Institution can elaborate on any of the details in this response with further evidence in whatever form is most appropriate. Our membership includes over 6000 environmental professionals who are well-positioned to share insights directly from the point of policy implementation.

In particular, the IES's **Environmental Policy Implementation Community** (EPIC) has expertise on how to deliver environmental

policy in practice. This response was developed with support from EPIC's Sound, Noise, and Vibration Forum.

Key messages

1. The IES supports the move towards more sustainable energy for the UK, yet it is important to make communities part of that journey by applying appropriate noise guidance to prevent unintended consequences. In that context, it is concerning to see that the draft guidance states that noise levels may be “considered reasonable in the context of the need for renewable energy generation” rather than basing the reasonableness of noise levels on evidence of their effects.
2. The scale of the Government's ambition is clear, in line with the commitment in the Clean Power Action Plan to decarbonise the power sector by 2030 and provide 27 to 29GW of onshore wind within Great Britain, from the current installed capacity of around 14.8GW today (over 16GW in the UK). To secure this ambition over the long-term, bringing communities along on that process will be essential to achieving a future with thriving people, a healthy economy, and a flourishing environment.

Responses to questions

1. Do you agree with our proposed approach using a single limit which takes the minimum of the day & night limit at each windspeed & applies at all times?

No. The suggested noise limits appear to have limited justified from the perspective of the best available scientific evidence.

The [WSP report](#) used to inform the consultation suggested that the [WHO 2018 ENGER recommendation](#) for wind turbine noise should not be used as a basis for developing new guidance on wind turbine noise.

It went on to recommend, however, that a fresh, systematic review and meta-analysis of evidence on exposure-response relationships for wind turbine sound and noise annoyance is now considered likely to produce informative results and that such information could provide a justifiable basis for establishing a framework in the UK until specific UK studies have been undertaken.

The same report also identified that the evidence supporting the use of a relative impact threshold (i.e. assessing the wind turbine sound level relative to background sound levels) is weak.

It is not clear from the consultation as to how the proposed limit is linked to the evidence of health impact. We take the view that this is the latest evidence for wind turbines and should be considered and used to justify the noise limits.

If a review has not been conducted in accordance with the recommendations of

the WSP report, we suggest that it is carried out and used as the basis for deriving noise limits in line with a systematic review of the evidence.

We would also argue that little or no weight should be placed on the margin by which the wind turbine sound level exceeds the background sound levels if that results in a lower level of protection compared to that provided by the absolute criteria obtained from a systematic review of the evidence.

2. Do you agree with our proposal to raise the lower value for the daytime noise limit range to 37dB?

It depends. The draft guidance proposes to increase the lower-level value from LA90 10-minute 35dB to 37dB and paragraph 1.13 implies that advancements in wind turbine technology since 1996 allow a higher noise limit to be applied, rather than determining whether the evidence of health impact supports the increase.

This could have negative ramifications for communities where existing sites have been established using the LA90 limit of 35dB.

If the limit is increased to 37dB both for new sites and also for sites nearing the end of their life, this would likely bring more turbines onto sites, increasing noise impacts on communities.

We would only support such a move if it was justified using the results of a systematic review of the evidence base, including effect thresholds and impact assessment on public health, as noted in response to Question 1.

3. If you do not agree with the proposed approach of using a single ‘limit’, what would you suggest as an alternative approach and why? Please include discussion of the appropriate dB noise criteria for your suggested approach and provide supporting evidence.

The challenge for this approach is that it would offer additional room to manoeuvre based on background noise levels, based on whichever limit is higher.

There is not any evidence linking annoyance to the difference between background noise and target noise level as outlined in the WSP report, so this could lead to higher levels than those lower limits. For example, if the background LA90 was 40dB, it could lead to a level of 45dB.

There needs to be greater transparency around how this works in practice and whether or not there is an evidence base behind it.

This is essential to determine whether communities would be sufficiently protected from the adverse effects of noise.

Other factors such as upwind/downwind positioning of windfarms may be relevant, with the extent determined by the amount of time spent within the wind direction quadrant.

It should also be noted that prevailing wind conditions are not always compliant with our expectations, as evidenced by the experiences of IES members on sites in the past.

4. Do you think the updated guidance provides adequate advice for assessing and controlling the impact of Amplitude Modulation? Please explain your answer and provide supporting evidence.

No. We do not agree that assessment of amplitude modulation (AM) should be dealt with by compliance monitoring after the establishment of the wind farm. The IES believes this is the wrong approach, particularly given that AM is often worse at night.

Paragraph 2.7 states that “the current consensus is that AM cannot be predicted. Tonal noise and AM are therefore best controlled through enforcement of planning conditions which include the application of character corrections as described in section 4. Consequently, character corrections should not be added at the planning/application assessment phase.”

ETSU-R-97 did not take account of this aspect, and it is important to recognise that where there have been problems with turbines in the past, it has typically resulted from AM.

This would be best alleviated through examples of good practice regarding the design of wind farms, such as through the use of ‘candidate turbines’.

The occurrence of AM should be identified at the design stage and allowed for in the proposed wind farm. It is our understanding that in France and Germany, specific conditions are applied to set a separation distance between the proposed wind farm turbines and the nearest sensitive receptors.

In the original ETSU-R-97 (Paragraph 25 Summary) the concept is considered appropriate for small windfarms, so this approach might be effective at reducing the effects of amplitude modulation.

Regardless, we strongly believe that the precautionary principle should always be applied, so these considerations cannot be left to post-development monitoring, otherwise the associated risk will be unfairly displaced to local communities and local authority professional staff, the latter of whom will be responsible for addressing the resulting complaints.

There is currently a proposal for an international standard relating to AM, to be included within the International Electrotechnical Commission (IEC) 61400 series of standards that deal with wind turbines. The Government should consider this initiative and how it can support effective guidance in this area.

5. Do you agree with the other technical updates to the Draft Guidance on the Assessment and Rating of Wind Turbine Noise?

Another concept that is no longer reflected in the draft guidance (compared to ETSU-R-97) is warranty.

In the past, turbine manufacturers would issue a warranty guaranteeing that there would not be any issues with their turbine based on measurement data, where their turbines had been used on a large number of sites with measurements that allowed them to describe the tonality.

At the time, tonality was seen as the biggest issue, but the same approach could be applied for other issues.

We are not aware that any manufacturers are currently willing to adopt the same practice with amplitude modulation, as it cannot be measured ex-situ, though these kinds of approaches may be worth considering.

Ultimately, the appropriateness of this approach may depend on layout and ground topography, so it may be more difficult to replicate this kind of approach.

6. Do you have any further comments on the proposed updates that you wish to make the Government aware of?

Firstly, while the consultation has been published by DESNZ (rather than as a joint consultation with Defra), the responsibility for noise in the environment falls with Defra, so strong collaboration will be essential.

The IES understands that nobody from the Defra Noise Team was formally part of the Peer Review Project Steering Panel, though Defra's Noise Technical Lead attended a workshop as part of the process.

Cross-departmental working on this issue will be important to successful implementation, so we would recommend a transparent dialogue between DESNZ and Defra as the final guidance is developed.

Secondly, community engagement is vital for the success of any proposed wind farm. Bringing communities along with decisions

is critical, both in terms of transparency of decisions and evidence, as well as giving communities fair financial consideration.

The burden of risk should be shifted away from communities wherever possible, whereas the draft guidance is currently shifting a substantial portion of the risk towards them.

The potential to achieve mutual social, economic and environmental benefits needs to be clearer, as the current draft guidance could lead to absurdities that favour the economic conditions too heavily.

There is a common sense reading of the guidance that avoids these issues, which should be made explicit to avoid differentiated or problematic implementation.

There is also a point to be made on financial connection and balance. The draft refers to the financial connection needing to be firm in perpetuity, which excludes some compensation options.

Evidence from the WHO indicates that, if people benefit financially from a wind farm, then they will likely have greater tolerance of noise levels. It may be worth revisiting the current definition of financial benefit in the draft to better include such compensation schemes.

Thirdly, there are two points where further clarification is needed. Where the draft guidance refers to local planning authorities, greater clarity is needed on whether large wind farm developments would be considered to be Nationally Significant Infrastructure Projects and potentially excluded from the scope of consideration by local planning authorities.

Also, as wind farms are likely to be located in rural areas and given the Government's commitment to building 1.5 million new homes over the course of this Parliament, clarity is needed on whether existing wind farms will be taken into account during new residential developments in green or grey belt areas, to ensure the principle of the guidance is applied in practice.

“Until a fresh, systematic review and meta-analysis of evidence is considered ... we strongly believe that the precautionary principle should always be applied.”

**– Christopher Fry, Chair of EPIC's
Sound, Noise & Vibration Forum**



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