Department for Energy Security & Net Zero

Updated Guidance for the Assessment and Rating of Wind Turbine Noise

Consultation on proposed updates to technical guidance for the assessment of noise emissions from onshore wind turbines

Closing date: 29 August 2025

July 2025

Any enquiries regarding this publication should be sent to us at:
onshorewind@energysecurity.gov.uk

Introduction

The Government is committed to delivering a clean, affordable and secure energy system by 2030. In December 2024 the Government published the Clean Power Action Plan, setting out a pathway to achieving the 2030 mission. Onshore wind is a mature, efficient, and cheap electricity generation technology, and will play a crucial role in delivering our decarbonisation and economic goals. The Clean Power Plan stated that to decarbonise the power sector by 2030, 27 to 29GW of onshore wind will be needed within Great Britian, from the current installed capacity of around 14.8GW today (over 16GW in the UK).[1]

Noise guidance for onshore wind is one of several factors which determine where turbines can be built in relation to residential properties or significant conurbations. Government is committed to ensuring that decision makers have access to the best guidance, enabling onshore wind to be built whilst also balancing potential impacts. Therefore, it is important to balance opportunities for energy generation with the impacts of noise emissions from turbines.

Technical guidance for the assessment of noise emissions from onshore wind turbines, known as ETSU-R-97, provides comprehensive advice to Local Authorities across the UK for appraising planning applications for onshore wind developments[2]. ETSU-R-97 was published in 1996. Whilst a best practice addendum was published in 2013 and additional Government-commissioned research in 2016, the guidance itself has remained unchanged[3].

Government commissioned an independent technical scoping review to consider whether the guidance could be refreshed[4]. The scoping review was published in 2023. Government carefully considered the recommendations from the review, concluding that guidance would benefit from targeted updates.

Government has worked closely with noise policy leads, academics and professionals at the Institute for Acoustics, expert acoustic consultants with experience in the field of wind turbine noise assessment, and wind industry acoustic engineers. The proposed updates aim to bring guidance in line with available evidence, developments in turbine technology and wind turbine noise assessment methodologies, and government policies on noise and Net Zero.

Whilst the majority of the updates are technical in nature, Government is proposing to amend noise limits defining how much noise from onshore wind turbines is acceptable. This has implications on the amount of land made available for onshore wind deployment and the limits above which noise from proposed turbines are considered too loud.

This consultation seeks to gather views on proposed updates and should be considered alongside the Draft Assessment and Rating of Wind Turbine Noise Guidance provided on GOV.UK.

The draft guidance does not represent a final position from government and should not be used by local planning authorities during or after the consultation period in relation to ongoing planning applications.

[1] HM Government, Clean Power 2030 Action Plan: A New Era of Clean Electricity, 2024
[2] HM Government, The Assessment and Rating of Noise From Wind Farms, 1996.
[3] Institute of Acoustics, Good Practice Guide on Wind Turbine Noise, 2013. & HM Government, Review of the Evidence on the Response to Amplitude Modulation from Wind Turbines, 2016.
[4] WSP, Report for UK Government: A Review of Noise Guidance for Onshore Wind Turbines, 2023.

It should be noted that noise from onshore wind is distinct in nature from other forms of industrial noise. A complex framework is used to determine noise limits for onshore wind developments. Therefore, this consultation is likely to be of particular interest to those with previous experiencing in the measurement and assessment of wind turbine noise. This includes (but is not limited to) the energy industry, local panning authorities and project developers.

Contents

General information

Why we are consulting

Onshore wind will play an essential role in Clean Power by 2030, leading to a more secure and affordable energy system, and creating new economic opportunities and jobs across the UK. We want to ensure the guidance for wind turbine noise remains as useful as possible to aid deployment of suitable onshore wind power projects, whilst ensuring noise impacts continue to be robustly controlled.

The government has worked closely with acoustic experts and leading scientists to update technical guidance for the assessment of noise emissions from onshore wind turbines. Proposed updates aim to ensure that planning authorities from across the UK have access to the best guidance, so that they can measure and take account of noise emissions when making decisions on onshore wind infrastructure. The purpose of this consultation is to set out and seek feedback on these proposed updates.

Consultation details

Issued: 4 July 2025

Respond by: 29 August 2025

Enquiries to: onshorewind@energysecurity.gov.uk *(please do not send consultation responses to this address, see below details on responding via Citizen Space)*

Consultation reference:

Updated Noise Guidance for Onshore Wind Consultation

Audiences:

Due to the technical nature of the guidance and unique nature of noise from wind turbines, this consultation is likely to be of particular interest to those with previous experience in the measurement and assessment of wind turbine noise. This includes (but is not limited to) the energy industry, local panning authorities and project developers.

Territorial extent:

United Kingdom

How to respond

We are inviting responses to this Consultation via the online e-consultation platform, Citizen Space.

When responding, please state whether you are responding as an individual or representing the views of an organisation. Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome. When considering responses to this consultation, the government will give greater weight to responses that are based on argument and evidence, rather than simple expressions of support or opposition.

Using the online service greatly assists our analysis of the responses, enabling more efficient and effective consideration of the issues raised. Therefore, we strongly encourage responses via Citizen Space. **Please contact us if you intend to respond using an alternative method**.

Respond online at: https://energygovuk.citizenspace.com/energy-infrastructure-planning/assessment-rating-wind-turbine-noise

We advise that you do not send responses by post to the department at this time, as we may not be able to access them.

Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our privacy policy.

We will summarise all responses and publish this summary on GOV.UK. The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

Quality assurance

This consultation has been carried out in accordance with the government's consultation principles.

If you have any complaints about the way this consultation has been conducted, please email: bru@energysecurity.gov.uk.

Consultation questions

As set out above, this consultation is seeking views on proposed updates to noise guidance for onshore wind. Consultation questions should be considered alongside the Draft Assessment and Rating of Wind Turbine Noise Guidance provided on GOV.UK.

The independent technical scoping review identified two key areas of ETSU-R-97 which required updating: (I) noise limits and (II) the approach to controlling the impact of Amplitude Modulation (AM) [5]. These will be considered in turn, followed by discussion of other technical updates which seek to deliver on the wider recommendations made in the 2023 Scoping Review.

Noise limits

ETSU-R-97 sets noise limits defining how much noise from onshore wind turbines is acceptable. The primary purpose of this decibel level (dB) noise criteria is to balance opportunities for energy generation with noise emissions from turbines.

The dB noise criteria that are set have two practical implications. Firstly, they provide design criteria for pre-consent noise assessments, enabling developers and local planning authorities to assess and predict potential noise effects at different wind speeds and against baseline background noise levels. Secondly, and from these assessments, they provide 'limits' to be applied in consent conditions. Following noise complaints received during operation (if any are received), measurements can be carried out to determine compliance against these limits and, if found to be in breach, the criteria require the generator to take measures such as controlling turbine speeds (and, in turn, generation output) to stay within the noise limits. Developers will seek to avoid this scenario and will therefore aim to select suitable turbines and site them at distances that prevent any potential breaches.

ETSU-R-97 differentiates dB noise criteria by day and night, with the day-time lower limit range (35 - 40 dB) set lower than the night-time lower limit (43 dB), as measured at a noise receptor outside any affected property[6]. The noise limit at a given time is then determined by taking either a noise limit between 35 to 40 dB for day and 43 dB for night, or a noise limit 5 dB above the background noise level at each wind speed (whichever is greater).

ETSU-R-97 provides flexibility in the noise limit which can be set for day periods, with the actual limit used within the range dependent on site-specific factors. The night-time limit provided in ETSU-R-97 was rationalised with reference to protecting against sleep disturbance indoors, while taking into account the reduction in noise level from outside a building to inside. A separate criterion of 45 dB was also introduced for dwellings that are financially linked to the development, such as landowner properties. The ETSU-R-97 limits are also cumulative noise limits that apply to noise from all wind turbine developments in the vicinity.

[5] Amplitude Modulation means the variation of sound level in time. This can describe blade swish, an inherent feature of wind turbine noise, or a more recently identified acoustic phenomenon where wind turbines make unusual intermittent sounds in some instances, which can be described as sounding like thudding or pulsing.
[6] Noise limits are set as dB LA90 values, i.e. the noise level exceeded for 90% of the time, to allow for measurement at receptor distances minimising the influence of transient (non-wind turbine) contributory sources.

The 2023 Scoping Review recommended that the noise limits defined in the original guidance should be revisited in view of advancements in turbine technology, knowledge and scientific evidence of the potential impact of turbine noise, and the evolution of government noise policies.

The Government has given careful consideration as to how this recommendation could be delivered. While we want to give due consideration to the findings of the scoping review, we are aware that changes to the noise assessment criteria may have implications on the amount of land made available for onshore wind and the financial viability of future projects, as well as residential amenity for wind farm neighbours. Therefore, we are seeking views on the proposed updated approach and encourage you to share data on possible implications for:

- the amount of land made available for onshore wind
- deployment of onshore wind
- energy generation from onshore wind
- residential amenity for neighbouring populations, including levels of annoyance for windfarm neighbours and any impact on sleep disturbance.

Aligning day-time and night-time noise criteria

The 2023 Scoping Review specifically recommended that noise limits during the night should not be higher (i.e. less stringent) than during the day. This was recommended due to the potentially increased prevalence of AM at night, which, combined with a higher noise limit, could increase night-time noise impacts compared with day-time. Additionally, the scoping review noted that the higher night-time limit is ‘unusual’ and appears to be unique to the UK and Ireland.

Whilst the draft updated guidance continues to allow for separate background noise measurements to be taken across day and night, to deliver on this recommendation, it instructs developers and planning authorities to select a single ‘limit’ from these measurements to be applied across both periods. This single ‘limit’ is the minimum of the day and night limit at each wind speed and applies at all times.

1. **Do you agree with our proposed approach of using a single ‘limit’, which takes the minimum of the day and night limit at each wind speed and applies at all times? Please explain your answer and provide supporting evidence.**

Raising the lower value for the day-time noise limit range

Additionally, government has reviewed the specific dB limits set by the guidance. To balance opportunities for energy generation with the impact of noise emissions from turbines on the public, government is proposing to raise the lower value for the day-time noise limit range to 37 dB. This results in a day-time noise limit range of 37-40 dB. While the night-time noise limit remains set at 43 dB, it is anticipated that at most windspeeds the single limit will be defined by the day-time noise limit.

2. **Do you agree with our proposal to raise the lower value for the day-time noise limit range to 37 dB? Please explain your answer and provide supporting evidence.**

Alternative options for updating noise limits

While Government is proposing changes to the noise assessment criteria and day-time noise limit range as described above, this is not a final position. There are a number of alternative approaches updated guidance could take, including continuing to use the approach outlined in ETSU-R-97, which differentiates dB noise criteria by day and night.

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.

Amplitude Modulation

In some cases, the character of the noise arising from the operation of a wind farm may contain one or more distinctive acoustic characteristics that are not typical of wind turbine noise. As noise character may increase the impact of a noise, it is common practice to add a 'character correction'. In practice, this results in a penalty to the overall noise limits, to reflect the increased audibility and potential disturbance the noise character causes.

Amplitude Modulation (AM) is where the sound level (amplitude) varies with time in a repetitive manner (modulation). AM is an inherent feature of wind turbine sound and is acknowledged by ETSU-R-97. However, since the publication of ESTU-R-97 it has been identified that, in some instances, this modulation can become more pronounced and the magnitude of AM can exceed certain thresholds, leading to increased perception of turbine noise. AM is sometimes referred to as blade 'swish', but if the AM becomes more pronounced this can lead to the sound being described as thudding or pulsing.

The 2023 Scoping Review stated that previous guidance did not adequately control for the impact of AM and specifically recommended the development of advice for assessing and controlling the impact of AM, building on Government commissioned research published in 2016[7].

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.

[7] HM Government, Review of the Evidence on the Response to Amplitude Modulation from Wind Turbines, 2016.

Technical guidance updates

A number of other technical updates have been made to the guidance, which seek to deliver on wider recommendations made in the 2023 Scoping Review. These include:

- Updated descriptions of the profile of noise emissions from wind turbines, and relevant wind speed references and range, given evolutions in the technology since 1996.
- Clarification of guidance on determining noise limits such that developments are prioritised according to generation capacity.
- Providing clarification on the interpretation of 'financially involved' receptors for the application of noise controls
- Developing further guidance on cumulative impacts, incorporating existing evidence and best practice advice.
- Providing example planning condition wording and associated technical notes which can be referenced to simplify planning controls.
- Defining the way in which character corrections are to be calculated and combined.

5. Do you agree with the other technical updates to the 'Draft Assessment and Rating of Wind Turbine Noise Guidance'? Please explain your answer and provide supporting evidence.

Further comment

6. Do you have any further comments on the proposed updates to the 'Draft Assessment and Rating of Wind Turbine Noise Guidance' that you wish to make Government aware of? Please explain your answer and provide supporting evidence.

This consultation is available from: www.gov.uk/government/consultations/assessment-and-rating-of-wind-turbine-noise-guidance-proposed-updates

If you need a version of this document in a more accessible format, please email alt.formats@energysecurity.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.