

Appendix 11.1

Legislation, Policy and Guidance

1. INTRODUCTION

- 1.1 The Proposed Development, Millennium Wind Farm, is located to the south of Glenmoriston, Highlands. This Appendix describes the Policy and Guidance referred to and used to inform the noise impact assessment of the EIAR.

2. LEGISLATION

Control of Pollution Act 1974

- 2.1 The Control of Pollution Act 1974 (CoPA 1974) is relevant primarily to construction noise. Section 60 allows local authorities to impose restrictions on construction site noise, while Section 61 enables developers to seek prior consent for noise levels and working methods. Operational wind farm noise is primarily regulated through planning conditions, but in rare cases, Section 62 could apply if noise were deemed a statutory nuisance.

Environmental Protection Act 1990

- 2.2 The Environmental Protection Act 1990 (EPA 1990) is relevant to a wind farm noise assessment primarily through Part III, which addresses statutory nuisances, including excessive noise. Local authorities can take action under Section 79 if construction or operational noise is deemed a nuisance, considering factors such as duration, intensity, and impact on residents. If a nuisance is confirmed, an abatement notice under Section 80 can require mitigation measures. While construction traffic noise on public highways is generally excluded, noise from on-site activities may be subject to enforcement.

3. POLICY AND GUIDANCE

Planning Policy

National Planning Framework 4

- 3.1 The National Planning Framework 4 adopted in 2023 (Scottish Government, 2023) sets out the Scottish Government's overarching ambitions with regards to various national planning policies. Policy 11: *Energy* states that development proposals for all forms of renewable, low-carbon and zero emissions technologies will be supported, but that noise effects on communities should be assessed. Policy 23: *Health and Safety* states that development proposals that are likely to raise unacceptable noise issues will not be supported.

Onshore Wind Policy Statement 2022

- 3.2 The Onshore Wind Policy Statement (OWPS) 2022 (Scottish Government, 2022)

references ETSU-R-97, The Assessment and Rating of Noise from Wind Farms (DTI, 1997) and the Institute of Acoustics (IOA) document, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (GPG) (IOA, 2013) as the framework by which noise from wind energy developments is measured and assessed.

- 3.3 It is considered that adherence to the noise limits set out in ETSU-R-97 (referred to in the OWPS) ensures that the proposed Development will not give rise to unacceptable noise impacts as described in terms of the policy 23 of NPF4.

Planning Advice Note PAN1/2011: Planning and Noise

- 3.4 PAN1/2011 (Scottish Government, 2011) identifies two sources of noise from wind turbines: mechanical noise and aerodynamic noise. It states that; “...*good acoustical design and siting of turbines is essential to minimise the potential to generate noise*”. It refers to the Scottish Government’s ‘web-based planning advice’ on renewables technologies for onshore wind turbines, as discussed below.

Technical Advice Note: Assessment of Noise

- 3.5 The Technical Advice Note (TAN) to PAN1/2011, entitled *Assessment of Noise* (Scottish Government, 2011) refers to the Control of Pollution Act (Control of Pollution Act 1974) as the mechanism whereby local authorities can control noise from construction activities.
- 3.6 It lists several documents that contain advice on how to minimise such noise and includes British Standard BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites (BSI, 2014).

Scottish Government 2014: Web Based Planning Advice, Onshore Wind Turbines

- 3.7 The web-based planning advice for onshore wind turbines (Scottish Government, 2014) states that the sources of noise are; “...*the mechanical noise produced by the gearbox, generator and other parts of the drive train; and the aerodynamic noise produced by the passage of the blades through the air...*” and that; “*there has been significant reduction in the mechanical noise generated by wind turbines through improved turbine design*”.
- 3.8 It states that: “...*the Report, ‘The Assessment and Rating of Noise from Wind Farms’ (Final Report, Sept 1996, DTI), (ETSU-R97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available*”.

- 3.9 It notes further that: *“this gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions”*.
- 3.10 The document goes on to reference the IOA GPG document discussed in section 0 below in terms of assessing noise associated with wind turbine developments.

Planning Advice Note PAN 50

- 3.11 Planning Advice Note (PAN) 50 Controlling the Environmental Effects of Surface Mineral Workings (Scottish Government, 1996) provides advice on environmental effects arising from mineral working operations.
- 3.12 The advice is said to be relevant in considering planning applications, among other things, and is applicable to the construction of borrow pits which are frequently used during wind turbine construction and is relevant to blasting activities in particular.
- 3.13 PAN 50 Annex D The Control of Blasting at Surface Mineral Workings provides advice to planning authorities and the minerals industry on how to keep the effects of blasting from surface mineral workings within environmentally acceptable limits.
- 3.14 PAN 50 Annex D advocates primarily for the use of BS 5228 for the assessment of mineral workings noise, and for the minimisation of the need for blasting, as well as for engagement with the public, stating that:
- 3.15 *“The response of an individual to any such event is dependent upon the same factors as that of groundborne vibration with the understanding of the phenomenon through public relations and the attitude of the operators being of utmost importance”*.

Local Policy

Highland-wide Local Development Plan

- 3.16 The Highland-wide Local Development Plan (HwLDP) was adopted in 2012 and should be read alongside NPF4. Within the HwLDP, noise from a wind turbine development is relevant primarily to the policies 67 and 72.
- 3.17 Policy 67 states that *“...the Council will support proposals where it is satisfied that they are located, sited and designed such that they will not be significantly detrimental overall, either individually or cumulatively with other developments..., having regard in particular to any significant effects on... the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to... the likely effect of noise generation.”*

- 3.18 Policy 72 states that *“Proposals that may result in significant pollution such as noise... will only be approved where a detailed assessment report on the levels, character and transmission and receiving environment of the potential pollution is provided by the applicant to show how the pollution can be appropriately avoided and if necessary mitigated. Where the Council applies conditions to any permission to deal with pollution matters these may include subsequent independent monitoring of pollution levels. Major Developments and developments that are subject of Environmental Impact Assessment will be expected to follow a robust project environmental management process, following the approach set out in the Council’s Guidance Note “Construction Environmental Management Process for Large Scale Projects” or a similar approach.”*

Onshore Wind Energy Supplementary Guidance

- 3.19 The Highland Council’s Onshore Wind Energy Supplementary Guidance (OWESG) acknowledges that ETSU-R-97 and the associated IOA GPG represent best practice in terms of the assessment of noise from wind turbines, and that noise assessments submitted in support of wind turbine applications should be undertaken in accordance with the methods set out in those documents.

- 3.20 The OWESG further sets out four key principles:

a. Highland Council’s expectation is that all proposals seek to achieve noise limits at sensitive locations that are at the lower end of the range indicated in national guidance, and that they may seek limits lower than that in certain circumstances. This is because, in effect, national guidance addresses an average and therefore does not account for Highland’s generally lower level of background noise. For example, Highland has a generally low density of development and less noise-generating industry and transport infrastructure, with certain features like motorways not present. The specific limit will depend on area-specific factors and applicants are strongly encouraged to engage with the Council at the earliest opportunity to discuss noise limits of their proposal.

b. Further to the above, the selection of proxy background monitoring locations should also reflect this approach. Monitoring locations should be chosen which have very similar characteristics to the properties they will represent. Where such locations do not exist or cannot be used, the expectation is that monitoring locations with the lowest background levels will be chosen to represent other properties. Applicants are advised to liaise with the Council to discuss monitoring locations prior to installation of equipment.

c. Where noise from more than one wind turbine development may have a cumulative impact at any noise sensitive location, applicants must ensure this is adequately assessed in accordance with best practice, which includes consideration of both predicted and

consented levels.

d. Research into amplitude modulation is ongoing and currently there is no accepted best practice for measuring, monitoring or setting limits. Should any such guidance become available, Highland Council will expect developers to follow its recommendations.

Guidance

BS 5228: 2009+A1: 2014

- 3.21 BS 5228: Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1) provides example criteria for the assessment of the significance of construction noise effects, a method for the prediction of noise levels from construction activities, and practical information on construction noise and vibration reduction measures, promoting a ‘Best Practicable Means’ (BPM) approach to noise and vibration control.

Calculation of Road Traffic Noise

- 3.22 Calculation of Road Traffic Noise (CRTN) provides a method for measuring and calculating both the absolute noise levels from road traffic and the relative change in road traffic noise from a change in traffic flows.
- 3.23 Within the method is a simplified calculation to determine the change in road traffic noise based on a number of parameters, including changes to traffic flow volumes, average traffic speeds, and the percentage of heavy vehicles (which can include buses, goods delivery vehicles, construction vehicles, etc.). The method assumes that the road layout remains the same, with traffic flows occurring at the same distances from receptors.

ISO 9613: Acoustics – Attenuation of sound during propagation outdoors

- 3.24 The noise prediction methodology adopted for wind turbine noise uses ISO 9613 *Acoustics – Attenuation of sound during propagation outdoors* as the basis for the noise predictions, with some specific assumptions and adjustments specific to the calculation of wind turbine noise. ISO 9613 Part 1: *Calculation of the absorption of sound by the atmosphere*, provides attenuation coefficients for air absorption, while ISO 9613 Part 2: *Engineering method for the prediction of sound pressure levels outdoors* provides the overarching calculation method.

ETSU-R-97: The Assessment and Rating of Noise from Wind Farms

- 3.25 ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, presents the recommendations of the Working Group on Noise from Wind Turbines, set up in 1993 by

the Department of Trade and Industry (DTI) as a result of difficulties experienced in applying the noise guidelines at the time to wind farm noise assessments. The group comprised independent experts on wind turbine noise, wind farm developers, DTI personnel and local authority Environmental Health Officers. In September 1996 the Working Group published its findings by way of report ETSU-R-97. This document describes a framework for the measurement of wind farm noise and specifies noise limits, which were derived with reference to existing standards and guidance relating to noise emission from various sources.

- 3.26 ETSU-R-97 recommends that, although noise limits should be set relative to existing background and should reflect the variation of both turbine and background noise with wind speed; this can imply very low noise limits in particularly quiet areas, in which case, *“it is necessary to use a margin above background in such low-noise environments. This would be unduly restrictive on developments which are recognised as having wider global benefits. Such low limits are, in any event, not necessary in order to offer a reasonable degree of protection to the wind farm neighbour.”*
- 3.27 For daytime periods, the noise limit is 35-40 dB L_{A90} or 5 dB (A) above the ‘quiet daytime hours’ prevailing background noise, whichever is the greater. The actual value within the 35-40 dB (A) range depends on the number of dwellings in the vicinity; the impact of the limit on the number of MWh generated; and the duration and level of exposure. The quiet daytime periods are defined as evenings from 18:00-23:00 hours, plus Saturday 13:00-18:00, and Sunday 07:00-18:00.
- 3.28 For night-time periods (23:00-07:00 hours) the noise limit is 43 dB L_{A90} or 5 dB (A) above the prevailing night-time hours background noise, whichever is the greater. The 43 dB (A) lower limit is based on an internal sleep disturbance criteria of 35 dB (A) with an allowance of 10 dB (A) for attenuation through an open window and 2 dB (A) subtracted to account for the use of the L_{A90} rather than the L_{Aeq} noise measurement index.
- 3.29 At properties that are occupied by residents with a direct financial benefit from the wind farm, the daytime and night-time lower limiting values are increased to 45 dB L_{A90} .
- 3.30 It is stated that the $L_{A90,10min}$ noise descriptor should be adopted for both background and wind farm noise levels and that, for the wind farm noise, this is likely to be between 1.5 and 2.5 dB less than the L_{Aeq} measured over the same period. The $L_{Aeq,t}$ is the equivalent continuous ‘A’ weighted sound pressure level occurring over the measurement period ‘t’. It is often used as a description of the average ambient noise level. Use of the L_{A90} descriptor for wind farm noise allows reliable measurements to be made without corruption from relatively loud, transitory noise events from other sources.

- 3.31 With regard to multiple wind farms in a given area, ETSU-R-97 specifies that the absolute noise limits and margins above background should relate to the cumulative impact of all wind turbines in the area contributing to the noise received at the properties in question. Existing wind farms should therefore be included in cumulative predictions of noise levels for proposed wind turbines and not considered as part of the prevailing background noise.
- 3.32 The prevailing background noise level is set by calculation of a best fit curve through values of background noise plotted against wind speed as measured during the appropriate time period with background noise measured in terms of $L_{A90,t}$. The $L_{A90,t}$ is the noise level which is exceeded for 90% of the measurement period 't'. It is recommended that at least 1 weeks' worth of measurements are required.
- 3.33 ETSU-R-97 also specifies that a penalty should be added to the predicted noise levels, where any tonal component is present. The level of this penalty is described and is related to the level by which any tonal components exceed audibility.

A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise

- 3.34 In May 2013, the IOA published *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*. This was subsequently endorsed by the Scottish Government and is referenced in *Web Based Planning Advice, Onshore Wind Turbines 2014*. The publication of the Good Practice Guide (GPG) followed a review of current practice carried out for the Department of Energy and Climate Change (DECC) and an IOA discussion document (IOA, 2012) which preceded the GPG.
- 3.35 The GPG includes sections on Context; Background Data Collection; Data Analysis and Noise Limit Derivation; Noise Predictions; Cumulative Issues; Reporting; and Other Matters including Planning Conditions; Amplitude Modulation; Post Completion Measurements; and Supplementary Guidance Notes.
- 3.36 The Context section states that the guide;
- 3.37 "...presents current good practice in the application of the ETSU-R-97 assessment methodology for all wind turbine development above 50 kW, reflecting the original principles within ETSU-R-97, and the results of research carried out and experience gained since ETSU-R-97 was published".
- 3.38 As well as expanding on and, in some areas, clarifying issues which are already referred to in ETSU-R-97, additional guidance is provided on noise prediction and a preferred methodology for dealing with wind shear.

4. REFERENCES

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