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WORKING GROUP ON WIND TURBINE NOISE

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Noise from wind farms is one of the major considerations when seeking planning consent for a wind farm. This note briefly describes current advice available to planners and developers and outlines the reasons for the formation of a Working Group set up to provide information on the assessment and rating of wind turbine noise.

A Planning Policy Guidance Note on Renewable Energy, PPG 22 (1), was published by the Department of the Environment and the Welsh Office on 3 February 1993. PPG 22 contains an Annex on Wind Energy which includes some discussion on noise from wind turbines. This annex includes a description of the sources of noise from wind turbines, a discussion on the limitations on the use of BS4142 (2) and advice on noise related information that could usefully accompany a planning application. At the time of writing there was insufficient relevant experience of noise from wind farms and public reaction to the noise to be able to provide more specific guidance.

The PPG explains that the use of BS4142 1990, 'Method for rating industrial noise affecting mixed residential and industrial areas', may be inappropriate for the assessment of noise from wind farms for several reasons. These are listed as:-

a) Wind farms are likely to be developed in areas outside of the scope of BS4142 as indicated by the title.
b) The scope precludes situations where background noise levels are below 30dB(A). This level is typical of the background noise level which might be found at wind farm sites.
c) BS4142 states that noise measurements should not generally be made in winds greater than 5m/s average. This restriction guards against the effects of wind noise on the microphone (and influences on sound propagation). Wind farms are likely to be sited in windy areas where the BS4142 conditions may not be satisfied.

A more fundamental problem that may occur using BS4142 for the assessment of wind farm noise lies in the choice of units used to describe the specific noise source and the background noise. BS4142 specifies that the noise source is to be measured as L_{Aeq} and the background noise as L_{A90}. A characteristic of background noise in rural areas is that measurements of background noise measured in these two units can differ by 10dB(A), especially when background noise is wind related or contains relatively loud, intermittent sources. The rating method proposed in BS4142 would therefore indicate the likelihood of complaints even in the complete absence of other noise sources.

With no generally agreed procedure for determining noise levels that are acceptable to nearby residents, planners and developers have been required to use their own experiences to bring forward workable solutions by reference to the particular character and sensitivity of the area. Planners have the benefit of local experience on what the existing noise environment is in their area combined with the public's reaction to new noise making developments, whilst developers have a knowledge of the noise characteristics of wind turbines. Many wind farms, though not all, have had conditions relating to noise levels from the wind farm specified in the planning consents. These have varied in noise level and measurement units (eg L_{90} or L_{50}) from site to site but generally fall in to two classes. Either a flat rate noise level which shall not be exceeded at the nearest residence or a margin above the existing background noise which shall not be exceeded.

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It is however recognised within the DTI that there is still a degree of uncertainty among planners and developers. Planners do not have much experience of noise from wind turbines in rural areas. Developers have no noise targets for guidance when selecting sites for wind farms or deciding upon turbine layout. Therefore the DTI has set up a Working Group largely consisting of outside experts on wind turbine noise. The objectives of the Working Group are:

1) To review recent experience in the field of wind turbine noise. This will include an attempt to relate measured data to complaints and provide an expert assessment of the issues relating to wind turbine noise.
2) Define a framework which can be used to measure and rate the noise from wind turbines. This will include parameters to be measured, measurement methods, units and measurement periods and will fulfil all the necessary criteria required for planning conditions.
3) Provide indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours and encourage best practice in turbine design and wind farm siting and layout.
4) Encourage the widespread adoption of the Working Group's recommendations.

These recommendations are intended to serve as an informative, rather than prescriptive guide to assessing the environmental impact of the noise from wind turbines.

The Working Group has been asked to address the issues of broadband noise, tonal content and blade swish (the modulation of broadband noise at blade passing frequency). Three meetings of the Working Group have been held to date with the intention to produce a report in Spring 1994.

References.

1) Planning Policy Guidance Note: Renewable Energy, PPG 22, HMSO 1993.
2) Rating industrial noise affecting mixed residential and industrial areas, BS4142:1990.

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