

APPENDIX 10.2

METHODOLOGY FOR CALCULATING WIND SHEAR, DIFFERENT HUB HEIGHTS AND STANDARDISING HUB HEIGHT WIND SPEED

APPENDIX 10.2

Wind Speed Calculations for Hub Height

A GOOD PRACTICE GUIDE TO THE APPLICATION OF ETSU-R-97 FOR THE
ASSESSMENT AND RATING OF WIND TURBINE NOISE



4.5 Wind Shear Corrections

- 4.5.1 Basing the predictions on sound power data tested in accordance with the IEC 61400-11 standard (or equivalent) should mean that the wind reference used corresponds to hub height wind speeds, standardised to 10 m height using a fixed correction (see **Annex A**). These predictions can then be compared to background levels and/or associated noise limits derived using an equivalent wind speed reference, which will have wind shear taken into account directly.
- 4.5.2 When this is not the case, for example when considering background data measured against direct wind speed measurements at 10 m height, it is necessary to apply corrections to account for this. Any such corrections should be clearly outlined and detailed in any noise assessment so that they can be reviewed by any assessor. The assessment should be made using the most detailed information available.
- 4.5.3 Examples of methods which can be used to correct predictions to account for wind shear effects, when only using a 10 m mast, are included in **Supplementary Guidance Note 4** (wind shear). This note presents methods to calculate corrections on the basis of long-term data measured at different heights, but as such data may not be available for a specific site, typical shear values are also presented. Alternatively, similarly derived corrections representing typical (average) shear values can be applied to the wind speed reference used for the derived typical background noise levels.
- 4.5.4 The following simplified method is proposed for ease of use: applying a fixed correction by subtracting the following factors from the wind speed reference used in the turbine predictions: 1 m/s for turbine hub heights of up to 30 m, 2 m/s for hub heights of up to 60 m and 3 m/s for hub heights of more than 60 m. Such a generic approach would be suitable in the context of a study made using a 10 m mast to limit costs, in the absence of site-specific data.
- 4.5.5 If it can be demonstrated that the predicted levels are below the applicable lower fixed limits regardless of wind speed, it can be seen that wind shear would not have an effect on the assessment and this may form the basis of a suitable planning condition.