

**Mid Wales (Powys) Conjoined Wind Farms Public Inquiry  
SESSION 1: SSA C**

**PROPOSED REPOWERING AND EXTENSION TO LLANDINAM WIND  
FARM, POWYS, WALES  
BY CELTPower LIMITED**

**SUMMARY  
PROOF OF EVIDENCE OF**

**DR MATTHEW CAND**

**ON**

**NOISE**

**ON BEHALF OF CELTPower LIMITED**

**REFERENCE: BERR/2008/0003**

## 1 Personal Experience

- S.1 I am Matthew Cand. I am an Executive Engineer within Hoare Lea Acoustics, the specialist noise and vibration consultancy division of Hoare Lea & Partners, Europe's longest established firm of Consulting Engineers. Hoare Lea Acoustics has more than 40 years' experience in dealing with all types of sound and vibration issues. I specialise in the measurement, prediction and assessment of different types of community and environmental noise. I hold a degree in Engineering awarded in 2001 by the Ecole Polytechnique, France. I was then awarded in 2005 a Doctor of Philosophy degree in Mechanical Engineering, by Imperial College London.
- S.2 I have been employed in the field of acoustics and noise control for 8 years. I joined Hoare Lea Consulting Engineer's acoustics team in 2005 following completion of my post-graduate studies. I have personally developed particular expertise in wind farm acoustics, through my involvement in the practical assessment of over 40 wind farm projects. This included the assessment of the proposed Llandinam Wind Farm, from the earliest stages of the project. I provided expert witness evidence during noise hearings for the application for the Brechfa Forest West Wind Farm to the Planning Inspectorate.
- S.3 I am a member of the UK Institute of Acoustics, and I have been a member of the working group set up by the Institute in response to a request from the Department of Energy and Climate Change (DECC) to provide additional guidance on the assessment of wind turbine noise impact. The resulting Good Practice Guide has been recently published<sup>1</sup>.

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1 A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins, Institute of Acoustics, May 2013. [CPL-NOI-005]

## 2 Introduction and Scope of Evidence

- S.4 This Inquiry concerns the Llandinam Wind Farm ('the Development'), a development of thirty-four wind turbines which Celtpower Limited propose to construct and operate on land south-west of Newtown in Powys.
- S.5 The Development originally comprised the replacement of 102 existing turbines with 42 new turbines. An assessment of the potential noise impact of this Development was undertaken by Hoare Lea Acoustics during 2007-2008, the outcome results of which were contained in Chapter 11 of the Llandinam Repowering and Extension Environmental Statement, which was submitted in support of a section 36 application dated May 2008 (ref: BERR/2008/0003), which, for simplicity, I refer to hereafter in my evidence as 'the Original ES'<sup>2</sup>. I was personally involved in this assessment.
- S.6 Subsequent to this, Supplementary Environmental Information (SEI) was prepared in 2011 and submitted in January 2012 ("the 2011 SEI"). This followed the reduction of the scheme to 39 turbines, by the omission of Turbines T22, T23 and T24. This SEI comprised an updated noise assessment, which I undertook.
- S.7 The assessment followed the methodology set out in ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms', dated September 1996<sup>3</sup>, hereafter generally referred to in my evidence as 'ETSU-R-97'. By reference to the advice contained in TAN 8 'Planning for Renewable Energy'<sup>4</sup> and the National Policy Statement for Renewable Energy Infrastructure (EN-3) the use of the noise impact assessment methodology contained in ETSU-R-97 is the appropriate methodology for the assessment and rating of noise from Wind Energy Developments. This was the position at the time of the noise impact assessment reported in the Original ES, and it remains the case now.

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2 Llandinam Repowering and Extension Environmental Statement, April 2008.

3 ETSU-R-97, The assessment and Rating of Noise from Wind Turbines [CPL-NOI-001]

4 Planning Policy Wales Technical Advice Note 8: Planning for Renewable Energy, National Assembly for Wales, 2005 [CD/COM/016]

S.8 On 25 September 2012 PCC decided to object to the application and I will make reference to the reasons given for that objection ("The Objection").

S.9 An additional SEI, submitted in April 2013 ("the 2013 SEI"), included an updated noise assessment following the omission from the application of turbines T19, T20, T21, T25 and T26, resulting in a total of 34 turbines. I also undertook this assessment.

S.10 In undertaking a review of the assessment contained within the Original ES and subsequent SEIs, I conclude it can be satisfactorily demonstrated that the Llandinam Wind Farm can be constructed and operated within noise limits derived according to current best practice, as specified in the relevant planning policy and advice documents, including:

- Technical Advice Note (Wales) 11: Noise (TAN11)<sup>5</sup>;
- Technical Advice Note 8 (TAN8): Planning for Renewable Energy.
- Overarching National Policy Statement (NPS) for Energy<sup>6</sup>
- National Policy Statement (NPS) on Renewable Energy Infrastructure<sup>7</sup>.

S.11 My proof of evidence is divided into a number of parts set out as follows:

- in Chapter 3 I present a review of relevant national or regional planning policies and guidance;
- in Chapter 4 and Appendix A I present an overview of the specific approach to environmental noise impact assessment of operational noise from wind farms;
- in Chapter 5 I discuss the issues which pertain to noise from the Development, mainly in relation to operational noise impacts;

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<sup>5</sup> Planning Policy Wales, Technical Advice Note (Wales) 11: Noise (TAN11), 1997 [CPL-PLA-012]

<sup>6</sup> Overarching National Policy Statement (NPS) for Energy (EN-1), DECC, July 2011 [CD/COM/001]

<sup>7</sup> National Policy Statement for Renewable Energy Infrastructure (EN-3), DECC, July 2011 [CD/COM/002]

- in Chapter 6 I consider the previous Objection and statement of case of PCC;
- in Chapter 7 I address the specific concerns over noise raised by third parties in so far as these issues are set out in the available documentation. I will deal as appropriate with any subsequent outstanding matters on the subject of noise by way of rebuttal;
- in Chapter 8 I summarise the findings of my investigations.

S.12 The evidence which I have prepared and provide for this application reference BERR/2008/0003 in this proof of evidence is true and has been prepared and is given in accordance with the guidance of my professional institution and I confirm that the opinions expressed are my true and professional opinions.

### **3 Summary points**

- S.13 The planning guidance in TAN8 makes reference to the application of ETSU-R-97, the specified method of noise assessment of a wind farm in current and emerging planning and energy policy. Government policy for England, Scotland and Wales, together with ministerial statements, all issued since ETSU-R-97 was produced, have continually commended it as relevant guidance that should continue to be applied for the purposes of assessing and controlling noise from wind farms.
- S.14 It is acknowledged that the operation of a wind farm may be audible from some nearby properties in certain conditions. Moreover, compliance with the noise limits derived according to ETSU-R-97 may still leave some subjective loss of amenity for those who respond negatively to hearing wind turbine noise on occasions in a residential situation. However, notwithstanding the personal preference of any one person, noise levels that meet and are restricted to limits derived according ETSU-R-97 are not to be regarded as unacceptably high (in planning terms) as they meet the requirements of national planning policy for renewable development. Compliance with ETSU-R-97 means that effects on residential amenity are considered to be within reasonable and acceptable bounds.
- S.15 The assessment of effects from the proposed wind farm development, together with the setting of appropriate noise limits, has been undertaken in accordance with ETSU-R-97 and current best practice concerning the application of this methodology. Baseline noise levels were measured at locations determined in consultation with Powys County Council. Relatively conservative criteria based on the fixed absolute limits specified in ETSU-R-97 were used to derive appropriate noise limits.
- S.16 Wind turbine noise immissions levels have been predicted using current best practice procedures for representative candidate turbines. The predicted wind turbine noise immission levels have been compared to the derived noise limits. The assessment has demonstrated that compliance with the derived noise limits can be achieved at all locations, under all wind conditions and at all times.

- S.17 In addition, the cumulative noise assessment also considered the operational noise for the proposed Llaithddu, Neuadd Goch, and Hirddywel windfarms, as well as more distant sites whose impact was negligible. These calculations assumed simultaneous downwind propagation for all turbines, which represents a conservative assumption. The most up-to-date cumulative predictions remained below the relevant noise limits at all wind speeds and for all properties.
- S.18 Robust noise conditions are available to fully protect the amenity of local residents to the extent required by local and national planning policy. Such conditions are based on the requirement to comply with specific noise limits, these limits being derived for the proposed site in accordance with the foregoing ETSU-R-97 procedure, and fully accounting for neighbouring cumulative sites. Conditions of this type have been imposed elsewhere by Inspectors and Secretaries of State.
- S.19 Infrasound, low frequency noise, vibration and health risks have been fully considered. There is no evidence for health effects caused directly by exposure to the noise and vibration from wind turbines. Government advice properly reflects the current position on this issue.
- S.20 ETSU-R-97 based noise limits were formulated on the basis that the noise from wind turbines can contain a certain level of amplitude modulated aerodynamic noise (often referred to as 'AM'). Noise complaints have arisen at a small number of wind farms which seem to be related to increased levels of AM, perhaps above those suggested as typical within ETSU-R-97. Government has considered the small number of occurrences of reported increased levels of AM and confirmed that the guidance in ETSU-R-97 should continue to be followed. The most appropriate form of control for levels of AM above those considered inherent within ETSU-R-97 based noise limits is therefore by way of statutory nuisance action, should the need arise.
- S.21 Noise should not be considered as a reason for refusal and dismissal of the appeal relating to the proposed Llandinam Wind Farm.

**Matthew Cand PhD MIOA** 01 August 2013

