

**ELECTRICITY ACT 1989
TOWN AND COUNTRY PLANNING ACT 1990**

RES/Noise/POE/ARMcK/SSA-B

**APPLICATION BY RES UK & IRELAND LIMITED DATED 27 MARCH 2009
FOR CONSENT TO CONSTRUCT AND OPERATE A 100MW WIND TURBINE
GENERATING STATION IN POWYS, MID-WALES**

LLANBRYNMAIR WIND FARM

NOISE ISSUES

Proof of Evidence of

DR ANDREW R MCKENZIE PhD, BSc, FIOA

Hayes McKenzie Partnership Ltd

30th September 2013



PROOF SUMMARY

Qualifications and Experience

1. I hold the degrees of Doctor of Philosophy and Bachelor of Science in Engineering Acoustics and Vibration from the University of Southampton. I am a Fellow of the Institute of Acoustics. I am a director of Hayes McKenzie Partnership Ltd who are members of the Association of Noise Consultants.
2. I have worked in the field of acoustical engineering for over 30 years. I have been a noise consultant with Wilkinson-Murray Consulting in Sydney, Australia, a Research Assistant and Research Fellow at the Institute of Sound and Vibration Research, University of Southampton and a freelance consultant before forming the Hayes McKenzie Partnership in May 1991. My experience during this time has covered prediction, measurement and assessment of environmental noise, audiological research, hearing conservation in industry and subjective and psycho-acoustics research. I am a member of the Joint Institute of Acoustics / Institute of Environmental Assessment Noise Impact Assessment Working party and I am the Institute of Acoustics representative on MCS Working Group 3 - Small and Micro Wind Turbines.
3. My consultancy practice specialises in the assessment and control of noise from wind turbine developments and has been involved with over 800 proposed or operational sites in the UK and overseas. I have personally been involved with over half of these projects. I have given evidence at over 50 public inquiries, the majority of which have been concerned with wind turbine developments.
4. I have been involved with this project since November 2012 when I was asked to review the documentation on noise submitted with, and subsequent to, the planning application with a view to representing RES and the Llanbrynmair scheme at the conjoined Public Inquiry.

Purpose and Scope of Evidence

5. The Reasons for Refusal of Planning Consent for this scheme do not include noise but the Cabinet has noted that it reserves the right to raise further issues such as, inter-alia, *'health*



implications and any other matters of concern'. It is not known if these are likely to relate to noise.

6. The Cabinet Report concludes on noise that *'Environmental Health Services have been consulted and have stated that they have no objection to the proposed development subject to conditions managing noise levels at identified residential properties'* Accordingly, a full set of conditions on noise are proposed in the report.
7. The Initial and Updated Outline Statements by the Council do not refer to noise issues.
8. The Outline Statement by The Alliance is to the effect that not one of the six development should be allowed on the grounds of, inter-alia, *'imposition on the local community of intolerable exposure to health hazards'* (which may or may not relate to noise) and that they will also *'inflict on the residents living in close proximity a volume and type of noise which will cause serious harm to their residential amenity'*.
9. In addition, the Secretary of State has requested that he be informed on, inter-alia, *'the individual and combined impact of noise generated during construction and from the operation of the proposed developments taking into account the cumulative impact with other wind farms in the Powys area which have already been granted planning permission or where planning permission has been applied for'* and *'the potential impact of the proposed developments on human health'*.
10. This Proof of Evidence has therefore been submitted in order to inform the Inquiry on noise, and noise related health, issues related to wind farms, to review the assessment presented in the Consolidated SEI (CSEI) of July 2013 and to review and further address concerns raised by The Alliance and other 3rd Parties.
11. The Proof is divided into two parts.

In Part A, I:

- Introduce the topic of noise, noise terminology and noise assessment, to assist in interpreting the noise evidence (Section 3).



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- Provide a brief overview of national planning guidance covering noise from wind farms (Section 4).
 - Describe the baseline noise measurement procedure, noise prediction methodology and the assessment procedure used for wind turbine sites (Section 5).
 - Discuss other issues pertinent to the assessment of noise from wind farm sites (Section 6).
 - Review regulation procedures for noise from wind farm sites (Section 7).

In Part B, I:

- Present the noise assessment contained in the CSEI (Section 8).
- Present the cumulative noise assessment contained in appended to the CSEI (Section 9).
- Review the noise issues raised by The Alliance (Section 10).
- Present conclusions on the above (Section 11).

Conclusions

12. The noise impact assessment contained in the CSEI compares the predicted noise from the proposed wind turbines with noise limits specified in ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*, as referred to in TAN8, *Planning for Renewable Energy* and EN-3, *National Policy Statement for Renewable Energy Infrastructure* with appropriate guidance from the Institute of Acoustics *Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*.
13. The assessment shows that predicted levels of wind turbine noise from Llanbrynmair, acting either alone or in conjunction with the adjacent Carnedd Wen site, under worst case downwind propagation conditions, will meet the derived night-time and upper day-time noise limits at all locations under all wind conditions including typical wind shear effects.
14. In addition, noise limits have been derived for the two individual sites to prevent the combination of noise from the two sites exceeding these derived limits should the two be consented and constructed. Compliance with these site specific limits to be applied in these circumstances has been demonstrated in an Appendix to this Proof of Evidence.



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15. Noise from the turbines will not contain noise of specifically high or low frequencies or any tonal noise and there will be no perceptible infrasound or direct health effects. The ETSU noise limits allow for the fact that there may be a degree of aerodynamic modulation (sometimes referred to as blade swish) in the noise from any wind farm site.
16. It is my expert view that there can be no sustainable reason to refuse this scheme on noise grounds and that noise from the site acting alone, or in conjunction with the neighbouring Carnedd Wen scheme, can be controlled by suitably worded conditions.

I understand my duty to the Inquiry and have complied, and will continue to comply, with that duty. I confirm that this evidence identifies all facts which I regard as being relevant to the opinion that I have expressed and that the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion. I believe that the facts stated within this Written Statement are true and that the opinions expressed are correct.