



Electricity Act 1989: Section s36

Town and Country Planning Act 1990: Section 90

Electricity Works (Environmental Impact Assessment) (England and
Wales) Regulations 2000

Electricity Generating Stations and Overhead Lines (Inquiries
Procedure) (England and Wales) Rules 2007

Application by RWE Innogy
for a 150 MW wind farm and habitat restoration
at Carnedd Wen

Conjoined Public Inquiry (Session 4)
Matters in Common/Cumulative Effects

PROOF OF EVIDENCE: CONSTRUCTION TRAFFIC NOISE

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February 2014

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1 Personal Experience

- 1.1 I am Andrew Bullmore, Managing Partner of Hoare Lea Acoustics, the specialist noise and vibration consultancy division of Hoare Lea & Partners, Europe's longest established firm of Consulting Engineers. I specialise in the measurement, prediction and assessment of all types of community and environmental noise. I hold the first degree of Bachelor of Science in Engineering Acoustics & Vibration and also the higher degree of Doctor of Philosophy in Acoustics, both degrees being awarded by the University of Southampton. I am a member of the UK Institute of Acoustics. Hoare Lea Acoustics is also a member of the UK Association of Noise Consultants.
- 1.2 Over the past two decades I have personally developed particular expertise in wind farm acoustics which has led to me providing expert evidence to over 20 public inquiries. This experience has been gained through my involvement in the practical assessment of over 100 wind farms, including the Carnedd Wen Wind Farm, plus my technical management of several large scale applied research projects, including projects for UK Government Departments and the EU. These research projects include two experimental projects on the propagation of noise from wind turbines over long distances outdoors in rural areas, the development of specialised techniques for identifying wind turbine noise source generation mechanisms, and the objective and subjective rating of tonal noise and amplitude modulated noise from wind turbines. I have also been responsible for the technical management of a number of similarly large scale research projects which have considered the assessment of road traffic noise. These projects have included the modelling of road traffic noise propagation and the resultant effects on variability on the received noise levels at locations both immediately neighbouring and at varying distances of up to several kilometres from the source road(s).
- 1.3 I have previously submitted evidence to Session 2 of this public inquiry on behalf of RWE where I dealt with site specific noise issues associated with the Carnedd Wen Wind Farm development.
- 1.4 I understand my duty to the inquiry and have complied with, and will continue to comply with, that duty. I confirm that this evidence identifies all facts which I regard as being relevant to the opinions that I have expressed and that the Inspector's attention has been drawn to any matter which would affect the

validity of those opinions. I believe that the facts stated within this proof are true and that the opinions expressed are correct.

2 Introduction and Scope of Evidence

2.1 This evidence has been prepared specifically for Session 4 of the Public Inquiry and addresses the issue of noise associated with the cumulative effects of construction activities, and most notably those impacts associated with the movement of construction traffic along public roads.

3 Construction noise including HGV traffic movements on public roads

4.3 Noise arising from construction activities associated with the Carnedd Wen Wind Farm development has previously been presented in the following documents:

- The ES (sections 9.2.2, 9.2.6, 9.4.1, 9.5.1, 9.5.2, 9.6, 9.8) [AD/RWE/004]
- The cumulative ES (section 9.13) [AD/RWE/012]
- The SEI (sections 9.4, 9.4.1, 9.4.2, 9.5) [AD/RWE/015]
- The Proof of Evidence of Dr Andrew Bullmore for Session 2 (paragraphs 5.15 and 5.16), October 2013
- The Statement of Common Ground on Noise between RWE and PCC (section 3 + Construction Noise Conditions), October 2013

4.4 In summary of the information contained in the aforementioned documents, noise impacts from construction related activity were broadly separated into two categories: those associated with on-site construction activity (including both construction noise itself and the on-site movement of construction related vehicles) and those associated with the movement of construction related vehicles when travelling to and from the site along public roads.

Noise arising from on-site construction activity

4.5 It has previously been concluded in relation to the development of the Carnedd Wen Wind Farm only that all predicted on-site construction noise effects, including the movement of construction related traffic around the site,

would be of a local and short term nature and would overall be judged as having 'negligible' impact.

- 4.6 Within this conclusion of overall 'negligible' impacts, the worst case impacts were identified as affecting those properties lying closer to on-site access tracks by way of noise emanating from the on-site movement of HGVs. The fact that these worst case (but still negligible) impacts are wholly dependent on on-site construction activities directly associated with Carnedd Wen Wind Farm means that they will remain the same regardless of the construction timetables and plans for any of the other considered wind farm developments. The conclusions of overall negligible noise impact for on-site construction activities will therefore remain valid for Carnedd Wen Wind Farm whether or not these impacts are considered for Carnedd Wen Wind Farm in isolation or cumulatively with any or all of the other wind farm schemes under consideration.

Noise arising from off-site HGV construction traffic movements

- 4.7 The information previously submitted in the documents listed in paragraph 4.3 has also concluded that changes in off-site traffic related noise as a result of the construction of Carnedd Wen Wind Farm in isolation from other wind farm schemes will be of negligible significance.
- 4.8 In terms of the potential for cumulative noise effects arising from the construction of all the proposed wind farm schemes presently under consideration across the different SSAs, and not just the Carnedd Wen development, it was additionally concluded that the adoption of a construction traffic management plan to control cumulative traffic flows across all the schemes would additionally result in the effective control of traffic related noise. This control of traffic noise would result even though the management plan would primarily be designed to address traffic issues other than noise. This is because traffic noise is directly related to the volume and speed of the traffic, and it is these factors that any construction traffic management plan would seek to control.
- 4.9 In terms of the suggested construction traffic management plan, two separate plans/tools have subsequently been issued. The first is the Strategic Traffic Management Plan (sTMP) [CD-COM-TRA-001]. This relates solely to the movement of Abnormal Indivisible Loads (AIL) primarily bringing turbine components to the wind farm sites. The second is the output of the study

undertaken by Aecom on behalf of the developers 'Cumulative Impact assessment of non-AIL Construction Traffic on the Strategic Road Network' [CD-COM-TRA-003].

- 4.10 Considering first the situation relating to AILs, the summary position set out in the sTMP of specific relevance to noise impact is that, during days when AIL deliveries take place other construction materials deliveries will be suspended, that only one AIL convoy will travel to a selected wind farm development on any particular day, and that there will not be multiple AIL movement to more than one development at any time. Furthermore, AIL convoy speeds will be restricted to 40 mph on Dual Carriageways and Motorways, 30 mph on A-roads and 20 mph on minor roads. Because HGV traffic noise is dominantly controlled by the volume and speed of traffic, then noise from such low volume and low speed AIL movements will remain negligible. This will be the case even in the cumulative scenario when considering the potentially simultaneous construction of the 160 turbines of all the schemes before the present Inquiry together with the 12 turbines of the already consented Tirgwynt scheme.
- 4.11 Now considering the situation relating to non-AIL off-site traffic movements, once again it is appropriate to consider the scenario relating to the simultaneous construction of all 160 turbines of the schemes before the present Inquiry together with the 12 turbines of the already consented Tirgwynt scheme. In the Proof of Evidence submitted to Session 4 by Mr Atkinson the impacts specifically account for the highest predicted increases in the number of HGV movements which are expected to occur on the A458 at Welshpool Town Centre (paragraphs 2.3.12 and 2.3.13) and further west at Llanerfyl (paragraphs 2.3.14 and 2.3.15). In these cases the total percentage increases in traffic volumes due to HGV construction traffic movements are less than 10% when assessed against the total existing total traffic flows (comprising all types of traffic, both HGV and non-HGV), although the increases may be up to approximately 30% (this occurring for the case of Welshpool town centre) when assessed against existing HGV movements only. This increase of approximately 30% is based on 79 additional HGV movements per day.
- 4.12 The assessment reported in section 9.4.1 of the Carnedd Wen Wind Farm SEI [AD/RWE/015] concluded that the increase in noise level arising from the largest expected increase in the number of HGV movements associated with

Carnedd Wen Wind Farm only would be an increase of 1.6 dB(A) over the working day, this being based on a maximum additional 62 HGV movements per day over the baseline situation.

- 4.13 The cumulative traffic tool [CD-COM-TRA-003] prepared by Aecom, when used to calculate traffic flows associated with the simultaneous construction of the total 160 turbines of all the wind farm developments before this Inquiry plus the 12 turbines of the already consented Tirgwynt scheme, indicates a maximum increase of 79 HGV movements per day over baseline. It should be noted that this increase includes for the effects of AIL convoys displacing normal HGV construction material traffic movements, as previously discussed in paragraph 3.8. In terms of the associated increase in noise exposure this equates to 1.9 dB(A) over the working day. The change in noise level of less than 2 dB(A) overall is therefore still negligible, even when considered on this cumulative basis. This accords with the conclusions reached in section 9.4.2 of the Carnedd Wen Noise SEI where it was concluded that:

'a management scheme is likely to be put in place should significant levels of traffic from different sites coincide; the impact of this aspect of the construction traffic noise is therefore unlikely to be different from that assessed previously'.

4 Conclusions

- 4.1 In summary of the above, I conclude that the information and evidence previously submitted on behalf of RWE in relation to noise associated with construction related activities remains valid. This includes the movement of both AIL and general HGV construction traffic both on site and off site.
- 4.2 No more significant noise impacts than those previously reported have been identified. On this basis I conclude that the position that has been agreed in the Statement of Common Ground on Noise between RWE and PCC, [section 3 and Construction Noise Conditions 1 and 2] remains a valid and appropriate means by which construction noise, including that arising from off-site construction related traffic can be effectively managed on both a Carnedd Wen specific and a cumulative basis.



A handwritten signature in black ink, appearing to read 'A. Bullmore', with a long horizontal flourish extending to the right.

Andrew Bullmore BSc PhD MIOA

25 February 2014