

# REF

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## RENEWABLE ENERGY FOUNDATION

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### ***RENEWABLE ENERGY FOUNDATION RESPONSE TO:***

DECC Consultation on the *Revised Draft National Policy Statement EN-3 Renewable Energy Infrastructure* and related documents

### ***About REF***

The Renewable Energy Foundation is a registered research and education charity encouraging the development of renewable energy and energy conservation whilst emphasizing that such development must be governed by the fundamental principles of sustainability. REF is supported by private donation and has no political affiliation or corporate membership. In pursuit of its principal goals, REF highlights the need for an overall energy policy that is balanced, ecologically sensitive, and effective.

24 January 2011

## Introduction

1. In this response, we have concentrated on the draft NPS EN-3 statement for Renewable Energy Infrastructure. The revisions distinguishing this text from the earlier version appear to be limited and mainly cosmetic. Consequently, there remain a number of errors, inconsistencies, and instances of incomplete guidance that will inevitably result in confusion for decision makers, developers and the general public. **We conclude that EN-3 is still not fit for the purpose it is intended, and should not be formally approved.**
2. While we have not repeated our criticisms of first iteration of EN-3, those observations still stand. Indeed, it is difficult to believe that any of the previous criticisms, from REF or others, have been addressed.
3. We concentrate on specific issues in this response, particularly wind farm noise.

## ETSU-R-97 Noise guidance flawed

4. Our previous response (and undoubtedly that of many other respondents), pointed out that the Government's preferred wind farm noise guidance (ETSU-R-97) contains fundamental errors. This means that much time and money is wasted at public inquiries in debating how to remedy these flaws.
5. The Government's response is '*There is no substantive evidence to demonstrate that the fundamental guidelines are unsound and the Government therefore has no plans to revise them.*' Para 3.26 Govt response to first EN-3 consultation. **The government's position on ETSU-R-97 is demonstrably incorrect.**
6. In fact there is ample evidence that the guidelines are unsound. We give three examples.
  - a. The guidelines are predicated upon a fundamental misunderstanding of how wind speeds vary with height and weather conditions, and thus the guidelines understate noise impacts. The evidence for this is covered in a series of peer-reviewed scientific papers by van den Berg dating from 2003,

and the point has been widely accepted in the scientific world and by planning Inspectors.

- b. The ETSU-R-97 guidance on noise conditions is deficient at the most fundamental level. For example, the guidance fails to specify that noise compliance measurements be taken with the wind blowing towards a complainant's property; or that they be taken at the appropriate time of day and in similar meteorological conditions to those which triggered the complaint; or that they be taken with the turbines working, or working in a normal mode. The absence of these requirements renders the guidance at best vacuous and at worst harmful to the public interest.
  - c. Although developers are expected to predict turbine noise levels at neighbouring dwellings, ETSU-R-97 gives no guidance on how that should be done.
7. It is also clear that the authors of EN-3 have not read or understood ETSU-R-97. For example, para 2.7.56 states that ETSU-R-97 '*recommends noise limits that seek to protect the amenity of wind farm neighbours*'. This is incorrect.
  8. In fact, ETSU-R-97 specifically does not seek to protect neighbours' amenity and the authors are clear that the noise limits suggested exceed the levels necessary to preserve amenity (see page 62, ETSU-R-97).

### **Policy Alternative Exercise Flawed**

9. The Appraisal of Sustainability (AoS) for EN-3 considers an alternative policy which would reduce the adverse visual, noise and shadow flicker impacts of onshore wind farms. An evaluation follows in which this option is compared with the alternative of not reducing these adverse effects.
10. The evaluation is based on no hard data and is of very poor, indeed unacceptable, quality. It must be revised.

11. For example, in assessing the comparative impact of the alternative policy on health and wellbeing, it is asserted (para 2.2.3), with no supporting evidence, that existing wind farm noise policy only causes problems for individuals with '*heightened sensitivity*'. ETSU-R-97 makes no such claim, and again we refer to page 67 of that guidance where it is clear that the selected limits exceed those necessary to preserve amenity – not the amenity of the hypersensitive. We are not aware of any evidence that noise complaints are only made by unusually sensitive individuals.
12. We also draw DECC's attention to contrary evidence in a study commissioned by the Government, which found that wind farm noise limits are so high that sleep in neighbouring properties can be impaired. ('The measurement of low frequency noise at three UK wind farms, Hayes McKenzie DTI 2006 and the associated drafts which were initially withheld by DECC but subsequently released following a Freedom of Information request in 2009.) For example, Hayes McKenzie said in that document '*Furthermore, the basis of the ETSU-R-97 external night-time guidelines is to protect the processes of sleep with an internal noise level limit not to exceed 35 dB LAeq. Such an internal noise level could be anywhere between 5–10 dB higher than the existing internal noise environment within an occupied bedroom at night, i.e. clearly audible to the average listener who is awake.*' Note 'average' not 'unusually sensitive'.
13. Extraordinarily, the AoS concludes that the impact on health and well-being would be no different if an alternative policy where turbines are constrained to be more remote for dwellings was pursued. The reasoning used is that health and well-being impairment arising from, say sleep impacts, are short/medium term (i.e. 25 years). The disadvantages of these impacts are considered to be cancelled out by potential health benefits arising from increased employment opportunities in the construction or manufacture of wind turbines (Para 2.2.3).
14. Surely, it is patently obvious that this logic is unreasonable. Serious and specific health/well-being disadvantages for wind farm

neighbours cannot be negated by uncertain and unverifiable benefits for undefined others. And, in any event, no evidence is adduced that there would be a net increase in employment opportunities from the green economy when losses in employment from other sectors are also considered. Evidence from Germany indicates that net increases in employment do not necessarily arise, and indeed show that the net impact of subsidies to support renewables is almost certainly negative, a conclusion which is consistent with mainstream economic theory concerning the impact of taxation.<sup>1</sup>

15. The logic used in the other categories seems equally careless and dubious. For example, no evidence is produced to support the suggestion that wind turbines closer to dwellings produce a stronger economy as compared with turbines further from dwellings. Indeed, this section takes no account of the increased potential for property blight, even though this is referred to later in the same document (3.14.1).
16. No thought has been given to the possibility that fewer, better sited, turbines might be more effective. As we noted in our previous consultation, the performance of existing wind farms is hugely variable with load factors ranging from 5% to 50% per annum.

### **Appraisal Findings for EN3**

17. The section on Noise in the AoS at section 3.8 contains errors. It perpetuates the confusion between low frequency noise and blade swish noise. It states that complaints of low frequency noise occurred at 5 wind farms out of 126 and the Salford report is cited as the source of that claim. In fact, this reference is incorrect, since these numbers come from the earlier 2006 DTI report by Hayes McKenzie. Furthermore, the main point is that the report discovered it was not low frequency noise which the neighbours were complaining of, but blade swish noise. In addition, the subsequent Salford report found

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<sup>1</sup> See M. Frondel et. Al. *Economic impacts from the promotion of renewable energies: The German experience* (RWI: Essen, 2009). [http://en.rwi-essen.de/media/content/pages/publikationen/rwi-projektberichte/PB\\_Renewable-Energy-Report.pdf](http://en.rwi-essen.de/media/content/pages/publikationen/rwi-projektberichte/PB_Renewable-Energy-Report.pdf)

that there were noise complaints at 27 out of 129 on-shore wind farms.

18. The fact that the authors of the AoS clearly do not understand the noise studies which have been commissioned by the Government undermines credibility in the assessment.
19. We fail to understand why the impact of wind farms on 'equality and sustainable communities' is deemed to be neutral when the text acknowledges that there may be '*negative effects on health and well-being, particularly through increased disturbance, of those living in close proximity to a wind farm*'. It also acknowledges that property blight disproportionately affects lower income groups who have '*limited economic resources to move from geographically affected areas*'. AoS para 3.14.1. The document is at this point incoherent.

### **Further Comments on EN-3**

20. Returning to EN-3, the statement at para 2.7.58 that the IPC '*should use ETSU-R-97 to satisfy itself that the noise from the operation of the wind turbines is within acceptable levels*' is irrational and meaningless. There is no guidance in ETSU-R-97 about determining operational noise. ETSU-R-97 gives information on how to quantify pre-existing background noise over a range of wind speeds.
21. Similarly, paragraph 2.7.59 remarks that '*Where the correct methodology has been followed and the wind farm has been shown to comply with ETSU-R-97, ... etc*', but this is empty of meaning since there is no 'correct' methodology for establishing wind farm noise levels, as ETSU-R-97 is silent on the key issue of noise predictions. Without guidance on a methodology for predicting turbine noise, there is inevitable ambiguity on whether a wind farm can be shown to comply with any levels or not.
- 22. Monitoring Noise.** The AoS draft monitoring strategy (AoSMS) makes it clear that a requirement of the SEA Directive requires monitoring of significant environmental effects so as to identify at an early stage unforeseen adverse effects. Para 3.1 AoSMS.

23. However, apparently it has been decided not to monitor noise because '*No strategically significant effects identified*' (Table 3 AoSMS). This is manifestly inconsistent with EN-3, which remarks that '*Significant negative effects were identified for all 3 technologies covered by EN-3 for traffic and transport, **noise**, and landscape, townscape and visual*' (Emphasis added) (para 1.6.2 of EN-3).
24. A straight-forward assessment of the situation is that wind farm noise is a very significant issue, it provokes much debate and takes up much time and money at the planning decision stage. By refusing to acknowledge that it should be one of the environmental effects to be monitored, the Government is failing to comply with SEA Directive and confidence in the fairness of this policy will be eroded.

### **Anemometry Data**

25. **Wind resource** (2.6.30, 2.7.6) The NPS indicates that anemometry data is not a matter for the IPC and is not mandatory. This is an error. The collection and publication of wind speed data already occurs and must be a mandatory accompaniment to all wind farm applications, both onshore and offshore in order to comply with the EIA Directive. That is to say, irrespective of the economic relevance to the developer, there are other ramifications of environmental impact that must be considered if a planning decision is to be an appropriately informed and lawful. We explore these below.
26. Anemometry data is essential for a proper assessment of the noise effects of an on-shore wind farm application. Wind speeds at or near hub height are required in order to predict the noise impact of a development. It is the wind speeds experienced by the turbine blades that determine the rotational speed of the turbine which, in turn, determines the noise output of the turbine. Anemometry data needs to be made publicly available in electronic format so that any noise assessment can be independently verified. In fact, following various court actions, the principle of routine publication of anemometry data is now established, and the data itself has informed Inspector's decisions at a number of inquiries.

27. Wind speed data is also necessary to enable prediction of the daily and seasonal delivery of electricity. The quantity of 'renewable' electricity generated is a material consideration for the IPC, in that in all planning cases a balance needs to be struck between benefits and disbenefits of a proposal, and both sides of the equation must be accurately and intersubjectively quantified.
28. For example, Para 1.1.2 of EN-1 instructs the IPC to determine if there are '*adverse impacts from the development outweighing the benefits*'.
29. A further example may be found when the IPC is required to take a 'pragmatic approach' to varying shipping routes (paragraph 2.6.166) and weigh up the negative impact on the economy, not to mention the potential increase in CO<sub>2</sub> emissions, of any increased transit time of shipping, against the '*benefits of the wind farm application*'.
30. Without site-specific wind speed data it is impossible to accurately and intersubjectively quantify the benefits of a proposal. With the wind speed data, quantifying the benefits becomes straightforward.
31. **Peat.** (2.7.33 ff) We are of the firm opinion that building wind farms on or in close proximity to peat is unlikely to be acceptable in any circumstances. Furthermore, in view of the fact that EN-3 does not, as currently written, require any quantification of the CO<sub>2</sub> emissions saved by the proposed wind farm in operation, then it would not be possible to compare these emissions savings with the loss of CO<sub>2</sub> arising from digging up peat for tracks and foundations. This is ecologically unacceptable, and the NPS should be amended.
32. **Shadow Flicker.** (2.7.73) Yet again, the draft EN-3 repeats the unsubstantiated claim that shadow flicker only occurs within ten rotor diameters of a turbine. In correspondence with DECC before the last consultation closed, we requested the source from which this statement was derived and were informed that it was a paper by A.D. Clarke 1991 for Open University entitled "A Case of Shadow Flicker/Flashing: Assessment and Solution". However, on examination we found that this paper does not prove the ten rotor

diameter claim. In fact its recommendation is '*that turbines should be sited at least ten diameters distance from habitations, **and more if sited to the East/Southeast or West/Southwest, and the shadow path identified***' (emphasis added).

33. **EN-3** at para 2.7.65 refers to '*research and computer modelling*' has demonstrated this 10-rotor-diameter rule, but there is no reference to substantiate this claim. The given reference is still an indirect reference to the 1991 A. D. Clarke paper. If there was any basis for the assumption that shadow flicker is solely dependent on rotor diameter (and thus not dependent on total turbine height, for example), then experienced and reputable developers would not carry out the substantial assessments of shadow flicker over significantly greater distances.
34. **Inter-turbine spacing** para 2.7.8. Emerging evidence is that inter-turbine distances should be increased to 15 rotor diameters to achieve more cost-efficient power generation.<sup>2</sup> We fail to see the relevance or use of including in EN-3 an assertion about optimal separation distances significantly less than this when DECC has no evidence to substantiate the statement. It should be removed from the guidance.

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<http://esciencenews.com/articles/2011/01/20/study.yields.better.turbine.spacing.large.wind.farms>