

**Moore, Pippa**

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**From:** Daniel Baird [Daniel.Baird@ecotricity.co.uk]  
**Sent:** 30 September 2009 16:50  
**To:** nick.jn.sparks@bt.com  
**Cc:** Moore, Pippa  
**Subject:** RE: Proposed wind farm in the Vale of Berkeley

Dear Mr Sparks

cc. Pippa Moore

Thank you for your email of 17 September 2009 with follow-up questions. I am aware of Dale Vince's letter to you of the 28 September 2009, and note that Mr Vince does not refuse to answer your questions, but instead refers you to the ongoing EIA we are conducting for the answers.

Please see below my response to your further comments.

- A. I refer you back to the Vestas V80 lifecycle assessment I provided you with. This gives you the information you request for a comparable turbine design.
- B. As I have already responded, Ecotricity will be under an obligation to decommission the site at the end of the period granted by any planning permission.
- C. Our site selection process that we described at the Stinchcombe Parish Council presentation will form part of our EIA. The Berkeley Vale site is not within the Cotswolds Area of Outstanding Natural Beauty. We maintain that it is a good site for wind power development. If there were a comparable or superior development site available at Avonmouth, we would be seeking to bring both sites forward.
- D. Market pricing of electricity in the UK is both complex and fluid. I do not believe that this email exchange is an appropriate format for exploring this in detail. May I instead refer you to the website of Ofgem <http://www.ofgem.gov.uk/Pages/OfgemHome.aspx>.
- E. I refer you back to my previous answer to your Question No. 16. You may also find the following reports interesting.  
Impact of Intermittency [http://www.poyry.com/index\\_cases/index\\_cases\\_12.html](http://www.poyry.com/index_cases/index_cases_12.html)  
Managing Variability <http://www.greenpeace.org.uk/files/pdfs/climate/wind-power-managing-variability.pdf>
- F. I refer you back to my answer to question 22. No additional spinning reserve is required.
- G. Regarding the blade failure you refer to, there has been no catastrophic failure. As I explained in my answer to your questions 29-31 the single turbine was soon repaired back to full working order. There were no injuries and no damage to any third party property. The Health and Safety Executive have investigated the incident, there is no design fault. As of August 2008 there were 1452 of this specific wind turbine model installed worldwide and there has been no other incident.
- H. I do not know of a comparable quieter turbine than the candidate turbine we propose for Berkeley Vale. However, wind energy planning in England and Wales works within tight noise restrictions. Regardless of the turbine model, if the Berkeley Vale Wind Park proposal were going to create a significant noise nuisance (noise pollution) we would not be granted planning permission.
- I. I have made no such assertion regarding ice and refer you back to the answers I gave to your questions 43 to 46.

We are currently undertaking an EIA for the proposed Berkeley Vale Wind Park, and will submit an Environmental Statement as part of our planning application. As Dale Vince has already informed you, all pertinent issues will be covered by this publicly available document.

Kind Regards

Daniel Baird

**Daniel Baird**  
Project Manager

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**From:** nick.jn.sparks@bt.com [mailto:nick.jn.sparks@bt.com]

**Sent:** 17 September 2009 07:43

**To:** Daniel Baird

**Cc:** pippa.moore@stroud.gov.uk; d\_wride@lineone.net

**Subject:** RE: Proposed wind farm in the Vale of Berkeley

Mr Baird,

Many thanks for your reply.

I note your comment about Ecotricity not responding my questions and I should point out that I had already received a reply from a Mr Vince Dale of your company dated the 25<sup>th</sup> of August in which he refused to answer any of my questions. Therefore I can only assume that your response was prompted by my letter to SDC stating that fact. I will forward a copy of his letter to SDC to clarify the point and I am also happy to send a copy to you if he is unable to provide one for your records; please let me know if you would like a copy. The only variation to the questions that Mr Dale refused to answer is the addition of queries about ice formation and the emissions generated by the construction, operation and removal of the 70m monitoring mast. I sent the full list to Mr Dale but received no reply whatsoever to my second letter.

I have not had time to fully evaluate your responses but my initial thoughts are as follows.

I note your statement about estimated payback, but I think it would much more useful if you would provide the actual figures for carbon/CO2 emissions generated during construction, operation and removal of the industrial complex including the concrete base structures that will be required to support the eight 400ft high masts. I understand that the concrete bases are extremely large and heavy and require great effort to remove when the land needs to be returned to agricultural use. Could you confirm how heavy each base will have to be to support a structure taller than the Statue of Liberty? Also, will the concrete bases be sent to landfill once they have been removed as part of the decommissioning to enable the land to be returned to agricultural use? It would be useful to know the dimensions of the bases and the number of heavy vehicle movements that will be required to remove the bases and other equipment at the end of the life of this industrial development.

I would also be grateful if you could confirm what financial guarantee (perhaps a bond lodged in an escrow account of some sort?) will be put in place to ensure that the costs of removal will be met when the masts reach the end of their service life. It would seem sensible that planning permission would require this or a similar guarantee to ensure that enormous removal costs are covered if Ecotricity should no longer be in business when the turbines wear out and need decommissioning and removal.

I was extremely interested to read your comments re wind speed at the Avonmouth site - it would appear that this would be a more suitable location as it is an industrial area and faces the wide expanse of the Bristol Channel with uninterrupted access to the prevailing wind. I note that you already have three wind turbines there, and perhaps this would be an ideal site to increase the size of your operation. It would be at significantly lower environmental cost, and would also benefit from the proximity to Bristol, as well as the high local demand for electricity from industrial users near by. The site undoubtedly already has the

necessary electrical connections, has a huge network of access roads available in the dock area and sitting these huge structures next to existing industrial buildings would minimise the visual impact. Indeed, by sitting the turbines at the existing site in Avonmouth, there would no need to create any visual intrusion into the Cotswold Area of Outstanding Natural Beauty at all. I would be grateful if you could expand on your reasoning for choosing a rural area of outstanding natural beauty rather than an industrial area for constructing eight 400ft high masts.

Thank you for confirming that no subsidy will ever be necessary for construction, operation and removal of the scheme. I assume therefore that any electricity will be sold at the same price as that received by other generators using coal/oil/gas. If this is not the case, perhaps you could provide details of how the price varies at both the wholesale and retail level and the reason for any differences.

I note that you are unable to provide any information about the amount of electricity generated other than the website claim, but in order to make a judgement it would be useful to know what % of the time 16MW will be produced, and what % of the time the 11,585 homes that will be powered by your scheme will need to rely on other sources of generation. I understand that wind generation is both unreliable and extremely variable, so if you are unable to provide accurate figures, an estimation to the nearest 5% would be helpful. Is it possible to identify the number of days on which the wind speed is too low to generate less than say, 75%, 50% and 25% of the capacity, as well as an average number of days when no generation will occur i.e. less than 5% of the installed capacity? Is Ecotricity aware of or undertaken any research to identify the likely wind speed at the time of highest electrical demand – e.g. on still winter days? When the wind is not blowing, where will the 11,585 homes be powered from, and on how many days in an average will they need some power from another source?

Thank you for confirming that non-renewable powered spinning reserve will always be required to back up the wind scheme – could you provide an estimate of the carbon/CO<sub>2</sub> emissions that this requires as of course, this figure will need to be included in any overall calculation of carbon/CO<sub>2</sub> savings.

Thank you for the information regarding the blade failure you suffered. Could you provide details of any injury or damage caused by this failure and explain why such a failure occurred. I would doubtful if it was during the 10 minutes in each 343.6 million years you mention below, so perhaps there are other circumstances where catastrophic failure and collapse can occur. Could you provide more details, as requested, regarding debris size, maximum distance travelled, computer modelling you and the manufactures have carried out on this type of failure. It is obviously concerning that the design you are using elsewhere has suffered this type of catastrophic failure and would ask what design changes, computer modelling and testing has been carried out to prevent a repeat. I am sure that you have already carried out full tests on all your existing blades and replaced any that were made to the same design, but could you confirm that the defective design will not be proposed or used.

I note that the turbine you are proposed to use is amongst the quietest available – could you provide information on how much quieter other turbines are and perhaps share your reasoning for not reducing noise pollution to the minimum.

I am interested that in your assertion that ice will never be thrown from the blades – could you confirm that there is no recorded instance of ice being thrown from a wind turbine outside the area directly underneath it i.e. within 41m of the mast (41m is half the proposed rotor diameter – figure published on your website). If not, how far has ice ever been thrown and has any damage to property ever been caused.

I will consider your comments over the next weeks or so and let you know if I have any further questions.

Thank you for being a little more reasonable than your Mr Vince Dale.

Regards

Nick Sparks

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**From:** Daniel Baird [mailto:Daniel.Baird@ecotricity.co.uk]  
**Sent:** 15 September 2009 16:09  
**To:** Sparks,JN,Nick,DMQ R  
**Cc:** pippa.moore@stroud.gov.uk  
**Subject:** RE: Proposed wind farm in the Vale of Berkeley

Dear Mr Sparks  
cc. Pippa Moore, SDC

Thank you for your list of questions. I will address your questions in the order you have given them. For the purposes of transparency I have also responded to the additional questions (No. 39 to 46) that you added to your list in your subsequent letter to Stroud District Council (received 10 September 2009).

My apologies for the delay in responding, but we felt that your lengthy and detailed list of questions deserved proper consideration.

1-3 As detailed in our Scoping Request to Stroud District Council, our candidate turbine is manufactured by Enercon. Enercon have production facilities in Germany, Sweden, Brazil, India, Turkey and Portugal. As for CO2 payback on the complete lifecycle of a UK onshore wind turbine, we estimate 6 months to one year depending upon location. For further information on wind turbine life cycle, I refer you to a series of reports available on the Vestas website.

[http://www.vestas.com/en/about-vestas/principles/sustainability/wind-turbines-and-the-environment/life-cycle-assessment-\(lca\).aspx](http://www.vestas.com/en/about-vestas/principles/sustainability/wind-turbines-and-the-environment/life-cycle-assessment-(lca).aspx)

The Vestas V80 turbine is comparable in size and performance to our candidate turbine. As you can see the energy payback period is 7.7 months for an onshore installation.

4-5 Our Environmental Statement will include details of the construction processes and vehicle movements, including all abnormal loads. The number of movements is dependent on the final development design so has not yet been determined.

6 In addition to the turbines, the site will contain a small enclosed electrical substation, access tracks and crane pads. The access tracks and crane pads will temporary surfaces, aggregate over a geotextile membrane. On decommissioning the aggregate is recovered and the land returned to agricultural use. An additional area of hard standing, to the same specification as the track, will be used as an easement for the duration of the construction work. This will be returned to agricultural use on completion of the turbine construction.

7-9 We will connect to the grid via a buried cable taken along the adopted highway. We anticipate connecting to a 33kV line. No percentage loss is assumed as it is not relevant to the case for development. However, distributed generation that does not make use of the 275kV and 400kV supergrid, such as the Berkeley Vale Wind Park proposal, avoids the losses associated with these high voltage lines.

10 please see 1 – 3 above.

11 ecotricity will not claim a subsidy to construct and operate the wind park. We will not receive Non Fossil Fuel Obligation (NFFO) payments. NFFO is closed to new entrants, the last tranche being in 1998.

12 we anticipate applying for planning permission for the wind park for a duration of between 25 and 30 years.

13-14 ecotricity will be obliged to return the land to agriculture following decommissioning by conditions to planning permission and by the terms of our lease with the landowners.

15 The decommissioning of any existing generator is entirely a matter for the plant's owner and the appropriate regulating bodies. Connection of new renewable generation to the grid results in reduced demand from existing non renewable generation, cutting CO2 emissions.

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16 The ecotricity website states "Equivalent Homes – 11,585" illustrating the estimated power output of the Berkeley Vale Wind Park. For this estimate we use the Ofgem description of a medium home, consuming 3,300kWh/annum. Power generated by the Wind Park will be distributed by the National Grid. There is no suggestion that any electricity consumer will be exclusively powered by the wind park.

17-18 The ecotricity website states the capacity of the wind park will be 16MW, generation is estimated as 38,570,000 units (kWh) per year.

19-21 The service interval for our candidate turbine is six months, and will involve the vehicle movement of a transit type van. Enercon warranty their turbines at 97% availability, in our operational experience with Enercon turbines we have between 98 and 99% availability. Loss of generation during servicing is reflected in the published capacity factors, as is the case for all forms of generation connected to the grid. Please refer to the Digest of UK Energy Statistics (DUKES).

<http://www.berr.gov.uk/energy/statistics/publications/dukes/page45537.html>

22 Frequency stability is maintained by the use of an AC-DC-AC inverter system. The wind park does not work in the absence of the national grid power distribution system which includes a range of frequency response and spinning reserve capabilities. No new or additional spinning reserve will be required in response to this wind park development.

23-24 No helicopters are needed for construction or maintenance.

25-28 E82 turbines are certified under IEC61400, class IIA to an extreme 3-second gust (at hub height) of  $59.5\text{ms}^{-1}$  (133mph) and an extreme 10-minute average wind speed (at hub height) of  $42.5\text{ms}^{-1}$  (95mph). As such, these turbines are designed to survive a Category 1 Hurricane on the Saffir-Simpson scale (as was Hurricane Katrina as it crossed southern Florida, [http://en.wikipedia.org/wiki/Saffir-Simpson\\_Hurricane\\_Scale#Category\\_1](http://en.wikipedia.org/wiki/Saffir-Simpson_Hurricane_Scale#Category_1)).

In over 17 years' hourly data from the nearby Met Office Avonmouth wind monitoring station, just 10 hours have been recorded with an average wind speed exceeding the E82's cut-out speed of  $25\text{ms}^{-1}$  (55.9mph). The resulting Weibull probability distribution (a mathematical function based on empirical data) suggests winds there would reach (or exceed) the maximum  $42.5\text{ms}^{-1}$  for 10 minutes in each 343.6 million years.

29-31 I am not aware of any catastrophic failure of any Enercon turbine, UK or worldwide. Ecotricity did experience a very well publicised blade failure of one turbine at the beginning of this year. The turbine was soon repaired back to full working order.

32 The Environmental Statement for the Berkeley Vale wind park will have a chapter on noise, including data on the warranted noise level from the turbine at a range of wind speeds. Enercon turbines are a direct drive design so do not have gearboxes, high speed bearings and the noise associated with these. Enercon turbines are among the quietest turbines available.

33 From our terrain model, an observer in the Severn Estuary could theoretically see a turbine tip at a distance of 30km. However this visibility will be interrupted by buildings and vegetation, dramatically reducing the distance at which the turbines will be visible from most viewpoints.

34 Navigation lights are not normally fitted to our turbines. We only fit navigation lights in response to specific requests from aviation consultees such as MoD.

35 We have consulted with aviation consultees and have no objections regarding our proposed wind turbine development.

36 Please find attached details of our long term bird monitoring at our Avonmouth wind park.

37-38 Ecotricity are in the process of conducting a comprehensive Environmental Impact Assessment for the proposed Berkeley Vale Wind Park. We have not yet received a response from Stroud District Council on our Scoping Request, to agree the methodologies for assessing wildlife impacts. Such assessments will form part of the completed Environmental Statement.

*(the following replies relate to the eight additional questions for Ecotricity, that you sent to Stroud District*

Council)

39 We do not as yet have a lifecycle assessment for the CO2 emissions associated with a 70m mast. However, given the mass of the mast (total weight of mast and erection kit 2,150kg) and the absence of any concrete foundation, the lifecycle CO2 emissions are likely to be small. As you now know from our reply to questions 1-3, the wind park should have an energy payback period of under a year. The wind monitoring mast will not add significantly to this figure.

40-42 Temperature and humidity levels for ice formation can vary so the turbine is designed to automatically detect ice accumulation and shut down. The risk of ice being thrown therefore low.

43-44 On the rare incidents where we have experienced ice accumulation at any of our 51 existing turbines, the turbine has shut down automatically as designed. Any ice that is shed, therefore falls down to the area below the turbine, rather than being 'thrown'.

45-46 Turbine blades can be fitted with electrical de-icing. The system operates after the turbine has shut down to shed ice more quickly, rather than run continually. Power consumption is therefore modest and does not detract significantly from the lifecycle assessment (see 1-3 above). I am not aware of any de-icing systems using an anti-freeze spray or similar. As for loss of production due to ice, please see my response to questions 19-21.

I note that in your letter to Stroud District Council you state that "The questions I posed to Ecotricity are below, and I would stress that they refused to provide any information at all in response..." For the record I would like to make it clear that at no point have Ecotricity refused to respond, and the list of questions you put to Ecotricity (below) varies significantly from the subsequent list you sent to Stroud District Council ([http://www.stroud.gov.uk/docs/planning/planning\\_application\\_view\\_binary.asp?URL=%2FWAM%2Fdoc%2FPublic+Comment-552105.pdf?extension=.pdf%26id=552105%26location=VOLUME2%26contentType=application%2Fpdf%26pageCount=3%26appid=1001](http://www.stroud.gov.uk/docs/planning/planning_application_view_binary.asp?URL=%2FWAM%2Fdoc%2FPublic+Comment-552105.pdf?extension=.pdf%26id=552105%26location=VOLUME2%26contentType=application%2Fpdf%26pageCount=3%26appid=1001)).

Should you have any additional questions, I look forward to seeing these and replying in due course.

Kind Regards  
Daniel Baird

**Daniel Baird**  
Project Manager

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**From:** nick.jn.sparks@bt.com [mailto:nick.jn.sparks@bt.com]

**Posted At:** 17 August 2009 18:28

**Posted To:** Berkeley Vale

**Conversation:** Proposed wind farm in the Vale of Berkeley

**Subject:** Proposed wind farm in the Vale of Berkeley

As a very near neighbour of your proposed industrial development in the Vale of Berkeley I would be

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grateful if you could answer a few questions so that I can make an informed decision about the merit of your proposal.

1. How much carbon/CO<sub>2</sub> will be emitted in the construction of the turbines, masts and blades and where will they be made?
2. How much carbon/CO<sub>2</sub> will be emitted in the transportation to site of all materials and personnel required for the construction and commissioning of the wind farm?
3. How much carbon/CO<sub>2</sub> will be emitted in the construction of the bases and the erection and commissioning of the masts?
4. How many vehicle movements will be necessary to construct the mast bases and erect the masts, turbines and blades?
5. How long will the construction last and how many new jobs will be created? Please break the jobs created into those which will last for the construction phase only and those which will be permanent.
6. Will any buildings or other constructions of any kind be required apart from the eight masts?
7. How will the power be transported from the wind farm to the national / regional grid and what % loss is assumed in your planning?
8. What voltage will the link to the national grid operate at?
9. Will the link to the national grid be via underground or above ground cables?
10. How much carbon / CO<sub>2</sub> will be emitted during the construction of the link from the wind farm to the national grid?
11. What subsidy will be claimed by Ecotricity to construct and operate this wind farm? Please include the NFFO payments that you expect to receive.
12. What service life is planned for this wind farm and when will the land be returned to its current state?
13. What guarantee and financial obligations apply to returning the land to its current state at the end of the wind farm's service life?
14. If Ecotricity are not prepared to guarantee the return of the land to its current state at the end of the wind farm's service life, why would this be?
15. What existing generating capacity will be decommissioned as a result of this wind farm being built?
16. The Ecotricity website claims that 11,585 homes will be powered by this wind farm. What size of home is used for this estimate, what % of the year will they be powered by the wind farm and where will the electricity these homes require come from at other times?
17. The Ecotricity website claims that the wind farm will generate 16MW – for what proportion of an average year will output be at this level?
18. Based on your own business case assumptions, what is the average sustained power output throughout the year? i.e. 100% of the time.
19. What service interval do the wind turbines have and how many vehicle movements per year will be needed to carry out maintenance?
20. When a turbine is being serviced and hence offline for generation, what impact will this have on the overall power output?
21. What proportion of the time will one or more turbines be off line for maintenance and servicing during the total life of the wind farm?
22. How will frequency stability be managed in the output of this wind farm in the absence of any "spinning reserve"?
23. Will helicopters ever be needed to either assist in construction or maintenance of the proposed eight turbines?
24. If helicopters are ever needed, how many aircraft movements would be required and how much carbon/CO<sub>2</sub> will be emitted per aircraft movement?
25. What is the maximum wind speed that the turbines you propose to use have been subjected to in-service, both gusting and sustained?
26. What is the maximum wind speed that the turbines you propose to use have been tested at, both gusting and sustained?
27. What is the maximum wind speed that the turbines you propose to use have been designed to

service, both gusting and sustained?

28. What is the maximum wind speed ever recorded and predicted in the Vale of Berkeley, and/or within 20 miles of your proposed site?
29. Have any turbines of the type you propose to use, or any similar design, or those made or designed by the same company, ever suffered any catastrophic failure at any time – either in-service or during testing, and at what wind speed did that catastrophic failure occur?
30. During catastrophic failure, what is the average size and weight of blade debris?
31. Should one of your turbines suffer catastrophic failure, how far will debris travel? Please include the maximum distance travelled by any “outliers” that may be shown during the computer modelling of failure as well as any empirical/observed evidence from testing or in-service failure.
32. What noise level will your proposed turbines generate, and are there any other turbines available that are quieter?
33. From what distance will the turbines be visible?
34. Will the turbines generate any light pollution? E.g. red lights to warn aircraft of their presence?
35. Are the proposed turbines in a transit area for helicopters and other light aircraft?
36. Is there any evidence that birds have ever been killed by wind turbines?
37. Has an independent environmental Impact Study been carried out?
38. What impact on local wildlife is predicted by your environmental impact study?

I know that there are many other factors that will need to be raised with and considered by the planning committee, but I am certain that you will have the answers to these very basic questions to hand.

I look forward to receiving your reply.

Regards

J N Sparks  
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