REF
RENEWABLE ENERGY FOUNDATION
21 JOHN ADAM STREET, LONDON, WC2N 6JG
TEL: 020 7930 3636. FAX: 020 7930 3637
EMAIL: research@ref.org.uk
WEB: http://www.ref.org.uk

Correspondence between:

Dr John Constable, Director of Policy and Research, Renewable Energy Foundation

The Rt Hon Ed Miliband, MP, Secretary of State for Energy and Climate Change.

Letters included in this file:

1. John Constable to Ed Miliband, 7 May 2009

2. Ed Miliband to John Constable, 15 May 2009

3. John Constable to Ed Miliband, 18 May 2009

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The Rt Hon. E. Miliband, MP,
Secretary of State for Energy & Climate Change
Department of Energy and Climate Change
3 Whitehall Place
London
SW1A 2HD

7 May 2009

Dear Mr Miliband:

Open letter: Errors in your recent *Times* article

1. Writing in *The Times* last week (27.04.09) you remarked that:

   > "To all those who scoff at the idea of wind making a difference, my reply is that last year enough power for all the electricity for two million homes came from wind power."[1]

2. I have been contacted by a knowledgeable member of the general public who doubts this number and has asked me to check it.

3. The Government's own figures, taken from BERR and Ofgem, show that the UK's average domestic consumer uses about 4.45 MWhs per year, and the UK's wind farms generated about 5.77 million MWhs in the RO year 2007 to 2008.

4. That gives a "homes equivalent" figure of 1.23 million. **Your *Times* statement appears to be an exaggeration of over 50%.**

5. The only source of data roughly consistent with your figure is the website of the British Wind Energy Association, the industry lobby, which at the time of your article published a guesstimate of 1,862,128 homes. I can only infer that your advisors accepted this figure and rounded it up.

6. Detailed calculations expanding on this train of reasoning are given in the following Appendix.

7. I think you will agree that **as Secretary of State for Energy & Climate Change you should be seen to use Departmental empirical data rather than rough and ready approximations, from the BWEA for example**, and I trust that you will take steps to correct this matter in the future.

8. Further, in my view, you should not in any case use the homes equivalent figure, which is misleading to the public since domestic houses typically use only 30% of

[1] "Wind, sea, coal and nuclear power. Yes please", *Times*, 27 April 2009: *http://www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article6175506.ece*

national electricity, and because the comparison suggests that the turbines could take this many houses off-grid, which is not the case.

9. It would be much more accurate to express the significance of wind's generation in terms of national consumption (roughly 390 TWh in 2007[2]):

    5,777,249/390,000,000 = 0.015.

10. In other words the UK's 2,408 turbines (3.3 GW of capacity) are producing 1.5% of UK electricity (by MWh).

11. I think you will agree that these figures have the merit of being clear and accurate.

12. This letter will be published on the REF website.

Yours sincerely,

John Constable,
Director of Policy & Research.

[2] *Digest of United Kingdom Energy Statistics*, Table 5.1

Appendix: Detailed Calculations

i. Government data often uses the assumption that an average UK home will use ca. 4.5 MWhs of electricity. This number is arrived at by taking the annual domestic consumption (117,817,000 MWhs) and dividing by the number of domestic customers (26,434,[000][3]); 2006 data in both cases, as reported in BERR, *Digest of United Kingdom Energy Statistics* (2008), table 5b.

    117,817,000/26434 = 4.457 MWhs

ii. We note that the the British Wind Energy Association uses 4.7 MWh.[4]

iii. Thus we can calculate that the Secretary of State's article implies that wind generates:

    2,000,000 x 4,457 kWhs = 8,914,050 MWhs

iv. In addressing the question as to whether this is approximately correct we may note that *DUKES* 2008 reports that in 2007 wind generated 5,285,000 MWhs (Table 5.1), and that Ofgem reports (*Renewables Obligation, Annual Report*, Table B1) that wind both onshore and offshore generated ca. 5,777,249 MWh in the RO year 2007-2008.

v. Ofgem's figure, probably the more accurate of these two figures, would, assuming ca. 4.5 MWh per household per year, give an annual homes equivalent of 1.2 million homes.

vi. These numbers are clearly not precisely consistent with the Secretary of State's remarks. Indeed, his article's figure appears to be an exaggeration by some 50%.[5]

vii. However, the Secretary of State's figure approximates to that given on the British Wind Energy Association web site, which at that time of the article suggested that 1,862,128 homes equivalent were supplied from an installed capacity of 3,330 MWs.[6]

viii. Since the only source of data roughly consistent with Mr Miliband's figure is found on the website of the British Wind Energy Association, we infer that the Secretary of State's advisors accepted that data and rounded it up.

ix. It should be noted that not only are the BWEA's figures inconsistent with the empirical figures of BERR and Ofgem, but they are only very rough estimations derived from the following calculation:

    3,330 MW (installed capacity) x 8760 (hrs in a year) x 0.3 (assumed load factor) = 8,751,240 MWhs.

x. It should be noted that 8,751,240 MWhs, divided by 4.7 MWhs yields the BWEA figure of 1,862,128 homes equivalent.

xi. It should be further noted that the assumed Load Factor of 0.3 is in fact not consistent with empirical results, which record national LF of ca. 0.267,[7] so the BWEA's figure is a not only a rough approximation but a poorly grounded one.

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[3] The letter as sent had a typo at this point; the square brackets correct the slip.
[4] http://www.bwea.com/edu/calcs.html
[5] http://www.bwea.com/ukwed/index.asp
[6] http://www.bwea.com/ukwed/index.asp
[7] *DUKES* 2008, Table 7.4.

The Rt Hon Ed Miliband MP
Secretary of State
Department of Energy
and Climate Change

John Constable
Director of Policy & Research
Renewable Energy Foundation
21 John Adam Street
London
WC2N 6JG

15 May 2009

Dear Mr Constable,

Thank you for your letter of 7 May regarding my article in the Times on 27 April, entitled *Wind, sea, coal and nuclear power. Yes Please*.

I have noted your comments regarding the number of homes equivalent supplied by wind power and would like to clarify the Government's position.

While I would not disagree with the methodology that you have used in the appendix to your letter, I should point out that the statistics that you have used in your calculations are not the most up-to-date available and therefore your conclusion was incorrect.

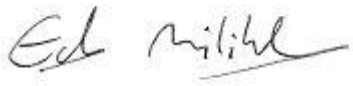
Your calculations were based on generation output from 2007-8 and domestic electricity consumption from 2006. Given the rapidly increasing levels of wind power generating capacity in the UK and changing energy consumption levels, it is important to use the most up-to-date statistics. Your data would not include the new capacity that came online in 2008, such as the Lynn and Inner Dowsing offshore wind farms and the Whitelee onshore wind farm, which all began generating at the end of last year.

Figures on wind generation output can be found on the publicly available Renewables Obligation register, maintained by Ofgem (www.ofgem.gov.uk). The most recent 12 month period for which data is available is for February 2008 to January 2009. The total output for which Renewables Obligation Certificates (ROCs) were claimed was 8,374,925 MWh over this 12 month period. This does not include any wind generation for which ROCs were not claimed.

Turning to the statistics on UK electricity consumption, the most recent official figures available are for the year January-December 2007 and are contained in the Digest of UK Energy Statistics (DUKE) 2008. available at http://www.berr.gov.uk/energy/statistics/publications/dukes/page45537.html
The mean UK household consumption of electricity in 2007 was 4.392 MWh. Your calculations used 2006 data, which was higher. Data for 2008 is due to be published in July in DUKES 2009.

Using these latest figures of 8,374,925 MWh total wind output and mean UK domestic consumption of 4.392MWh, this means that UK wind generation in the period February 2008-January 2009 provided power for the equivalent of 1,906,859 homes. This figure was rounded up to 2 million.

Finally, I note your intention to publish your open letter on the REF website and request that you also publish this response.



ED MILIBAND

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The Rt Hon. E. Miliband, MP,
Secretary of State for Energy & Climate Change
Department of Energy and Climate Change
3 Whitehall Place
London
SW1A 2HD

18 May 2009

Dear Mr Miliband:

Open letter: Your Recent Times article

Thank you for your letter, which is helpful and clarifies your methodology. It is pleasing to find a SoS willing to grapple with real numbers and share his calculations with the public. It is very much in our interests that the numbers underpinning political decisions and prominent statements are clear and well understood by everybody.

However, your letter does not close the matter and requires and deserves a response. Here are some further remarks:

Ofgem Data

I am satisfied that you did not use the BWEA guesstimate as the basis of your "2 million homes" in 2008 remark, though I think that my choice of data, actually the most recent audited report on the Renewables Obligation from Ofgem, dated 31 March 2009, which produces a different result (somewhat less at 1.2 million) is in several ways preferable.

The February 08 to January 09 data your department apparently selected for the article doesn't refer exactly to the time period you were discussing, and will replace lower capacity January 08 (a high yielding month), with January 09, which includes much new capacity installed, as you say in your letter, at the end of the year.

We have checked the Ofgem unaudited data for January 08 to December 08, and though this is greater than the audited Ofgem data for 07-08 that I used, at 8.1 TWh, it is not as high as your own figure of 8.4, so 1.8 million homes equivalent rather than 2 million. (Incidentally, most of this increase appears to be from offshore wind, confirming a long-standing REF argument that given the capacity limit for wind in the UK system, perhaps 10 GW, it makes sense to seek high yielding sites.)

More importantly, the unaudited Ofgem data tends to be somewhat fluid, and should be handled with care. Indeed, we are a little surprised that you relied on it. We are currently working on the renewables generation figures for our overview of 2008, to be published later in the year, including many checks and corrections. We have already noted that the offshore figures (particularly around October–November 2008) appear erroneous; in particular we see that the Ofgem records attribute 635,060 MWh to Scottish offshore wind farms. As far as we are aware, and according to current Scottish Renewables data, there is only one small

offshore site in Scotland, the 10 MW Beatrice station (Robin Rigg is under construction, but not complete, the first turbine being installed only in November, and not yet generating). Beatrice alone could not feasibly account for so large a quantity; consequently we conclude that a data entry error *may* have occurred. We will follow up with Ofgem. With luck, your figure will prove to be approximately correct on investigation, but the point is that the data is a little too fresh to be regarded as trustworthy at this time. Anyone who has used the Ofgem database knows that it takes time to settle.

Average Domestic Consumption

With regard to the domestic consumption figure, I used the figure from DUKES 2008, table 5b, because it is a year that has been very carefully studied, with regional analysis, and because it is offered as representative in DUKES.

I agree that it is interesting that average consumption seems to be falling a little, however, the difference between the figures, 4.39 MWhs per household according to your calculation, and the 2006 figure I used, 4.57 is not large enough to create a major difference in estimates. Frankly, such differences are lost in the 'noise' around any complex data set.

So, to summarise my observations so far, while I understand the calculation method behind your rhetoric, I would have been more conservative in my data selection had I been in the position of writing such an article, though I can guess at the pressures behind your choice.

However, *the real issue is that there are good reasons for not employing the homes equivalent calculation and presentation method*:

Explaining Energy Quantities to the Public

In fact, the concluding and main point of my letter goes unaddressed in your response.

I wrote:

8. Further, in my view, you should not in any case use the homes equivalent figure, which is misleading to the public since domestic houses typically use only 30% of national electricity, and because the comparison suggests that the turbines could take this many houses off-grid, which is not the case.

9. It would be much more accurate to express the significance of wind's generation in terms of national consumption (roughly 390 TWh in 2007[1]):

   5,777,249 /390,000,000 = 0.015.

My point was that "in any case", i.e. **regardless of what exact figure is used, 1.2m, 1.8m, 2m, the "homes equivalent" calculation is potentially very misleading and not helpful in giving clear guidance as to progress towards meeting the 2020 targets**.

Specifically, the "homes equivalent" figure is likely to lead to a misperception of significance, and particularly so should the public wish to understand the value for money offered by the Renewables Obligation. Assuming a ROC price of about £48 in 2007,[2] wind cost the consumer about £278 million in indirect subsidy, a very substantial sum, so it is important to be clear about the scale of the value returned.

[1] *Digest of United Kingdom Energy Statistics*, Table 5.1
[2] Data from http://www.e-roc.co.uk/trackrecord.htm

In my view, and I know this view is shared by many observers, a better method of expressing the output of a generator, any generator in fact, is as a fraction of total electrical energy generation, as noted above. (Despatchable generators can also be described as a fraction of peak load, as a means of estimating their national significance, but this option is not open to wind in any straightforward way.)

Some would go further and say that since electrical energy is only roughly a third of total national **energy** consumption, it would be best to express the wind energy generated as a fraction of Final Energy Consumption (i.e. all energy, heat, electricity, and transport), which is very roughly 1,745 TWh per year at present.[3] Taking the 2007 figure for wind generation we can calculate:

5,777,249 MWh / 1,745,000,000 MWh = 0.0033

In other words **wind generated 0.3% of UK Final Energy Consumption** in 2007, at a cost in subsidy of £278 million.

To put that in context, the EU Renewables directive requires a 15% renewable share of UK Final Energy Consumption by 2020. Clearly we have a very long way to go, and the costs will be high.

I realise that this isn't snappy or memorable, but it is a *realistic* perspective, though daunting.

I hope you will agree that this is a great deal less misleading than any homes equivalent figure which I really hope you or your department won't use again, however calculated.

You have asked that your reply to my original letter be published alongside it on the REF website. I am happy to do so, and will also append this response.

Yours sincerely,

John Constable,
Director of Policy & Research.

[3] BERR's estimated current FEC to be about 150 mtoe. BERR, *Renewable Energy Strategy Consultation* (2008), 48. 1 toe = 11.63 MWh (http://www.restats.org.uk/methodologies.htm).