

John Muir Trust response to  
U.K. Government Consultation  
on Electricity Market Reform

10<sup>th</sup> March 2011



## SUMMARY

A far wider reform of the electricity industry, within the context of a review of the overall energy needs and sources of the UK, is required than is proposed in this Consultation. This Consultation seems to focus on re-assuring the electricity industry, with the promise of yet more subsidies. The Government needs to re-focus its energy policy on delivering for the consumers, which will also improve the economy.

The John Muir Trust believes the Government's over-emphasis on renewable generation in their energy policy in recent years - rather than using the subsidy money which is taken from electricity consumers primarily to improve energy conservation - must be addressed immediately. Energy conservation is about three times as cost-effective as electricity generation.

The current market-led system of electricity supply, and the options proposed in the Consultation, have not adequately protected Security of Supply and will also excessively increase consumer bills. This will, in turn, impact on the economic performance of the UK. It is good to see DECC now recognising the security issue.

Data which has recently been collated from the NETA website demonstrates that wind production has been much less effective in the last two year than was predicted. The degree of difference between predicted and actual wind production; the extensive spread of low wind problems across the UK when certain conditions occur and the evidence of major swings from high to low production in very short time periods all combine to mean a requirement of very significant back-up plant. It also brings into question a lot of the assumptions about what a high wind power percentage in the electricity portfolio can deliver

## WHY JOHN MUIR TRUST IS RESPONDING TO THIS CONSULTATION

1. Whilst this Consultation is specifically about the reform of the electricity market, the Department of Energy and Climate Change must consider the place of such reform within the UK Government's responsibility to deliver a holistic and integrated sustainable energy strategy. The John Muir Trust believes that such a sustainable UK National Energy Strategy should be prioritised, for economic, social and environmental reasons, over piecemeal reform such as is suggested in this consultation.
2. Working with people and communities to conserve, campaign and inspire, the John Muir Trust is a UK membership organisation that seeks to ensure that wild land is protected and that wild places are valued by and for everyone. Wild land is one of the UK's finest assets – where our most spectacular scenery and abundant wildlife are found. Wild land also provides society with essential ecosystem services, such as clean water and retaining carbon deposits within peat,

**thereby contributing to a reduction in carbon emissions.** Wild land is a finite resource and needs to be fully considered in sustainable development decision-making.

3. The John Muir Trust has accumulated considerable knowledge, with input from expert advisors, regarding strategic energy issues, thus enabling the Trust to analyse whether strategic energy policy decisions fulfill sustainability criteria. This focus on energy policy is essential for the Trust's aims because wind generation and transmission infrastructure are impinging very significantly on the wild land resource. The Trust does not have figures for the whole of the UK but according to Scottish Natural Heritage, the "area of Scotland without visual influence of built development" (one of SNH's key indicators of the state of the Scottish environment) fell from 31 per cent in January 2008 to 28 per cent in December 2009. This drop represents an area around 14 times the size of Glasgow and followed a decline from 41 per cent to 31 per cent between 2002 and 2008. Roseanna Cunningham MSP, Minister for Environment in the Scottish Government confirmed that "This is in the main caused by wind turbine development and its associated visual influence which is greater than development at ground level." Wales has also been affected very significantly, as well as some regions of England.

#### **ELECTRICITY WITHIN THE WIDER ENERGY CONTEXT**

4. **The UK Government's energy policies, particularly the Renewable Obligations mechanism, are the key drivers for these huge impacts from the expansion of industrial scale wind developments and electricity transmission.** Against this backdrop, any further encroachment on highly-valued natural or cultural landscapes must be fully justified – in economic, social and environmental (both global and local) terms. Sustainable development does not mean weighing a perceived economic and/or social gain against environmental concerns. It means that a development is only sustainable if it can achieve a satisfactory outcome for each of the criteria.
5. However, it is not just the environmental impacts which are of concern. The current electricity market and subsidy mechanisms for renewable energy will increase prices very significantly for all UK electricity consumers. As far back as 2007, Ofgem reminded the government that the Renewable Obligations mechanism was a very expensive way to "buy" (reduce) carbon emissions.
6. The John Muir Trust believes that monies taken from consumers for subsidies, i.e. the renewable obligation costs at present, should pass through the government's books, as tax. This would bring transparency to a system which is currently opaque and would allow the costs and benefits of various systems to be compared – for value for public money. In reality, this would demonstrate that any money taken from consumers to achieve reduced greenhouse gas emissions whilst contributing to energy needs should be dedicated much, much more to energy conservation measures. Measures such as roof and wall insulation are about three times as effective as generating electricity – whether, for instance, such generation be from wind, nuclear or coal.

## Energy hierarchy model

7. UK governments, local authorities and others should be using an “energy hierarchy” model, see below, whereby every decision, in whatever department, is considered against the model to see which option is the most sustainable in order to rationalise the policy approach. **The energy hierarchy sets out different options for delivering carbon reduction, with those at the top having least risk of adverse social and environmental impact.** All elements of the hierarchy must be pursued but capacity should be taken up in the top elements to prevent environmental conflicts when setting targets for those elements lower down the hierarchy.

Table 1

Energy Measure
<b>Energy efficiency</b> (including insulation, efficient building design, energy efficient appliances)
<b>Micro-renewables and micro-CHP</b> Household / development scale incl CHP boilers, rooftop turbines, heatpumps, pv, solar thermal etc Heat Electricity
<b>Macro-renewables, Community scale</b> wind, biomass, hydro etc Heat Electricity
<b>Macro renewables and Carbon Capture &amp; Storage, Commercial scale</b> wind, wave, tidal, biomass – avoiding areas of environmental sensitivity Distributed Generation Grid based Generation
<b>Non-renewable generation</b> CHP Electricity generation only

8. Comparative costs, **which are indicative only**, using Energy Saving Trust statistics for conservation measures, are of the order below:

Cavity Wall Insulation	£8.64/MWh
Loft Insulation 0-270mm	£7.07/MWh
Loft Insulation 50-270mm	£25.92/MWh
Draught Proofing	£15.55/MWh

compared with the costs for new power stations, using government source statistics,

Nuclear	£38/MWh
Coal (including carbon cost)	£44/MWh
Gas (including carbon cost)	£44/MWh
Onshore wind	£55/MWh
Offshore wind	£84/MWh

9. This comparison of costs was done in 2008 so costs will have increased but this still gives some indication of the potential of energy conservation if it were funded at the same level as renewable generation is.
10. A key problem, when considering the relative costs of any kind of energy provision and what we might call “climate change” costs, is the fact that most additional costs associated with renewable energy production and increased transmission costs are met by the electricity consumer ultimately, whilst provision to encourage energy conservation measures generally comes from taxation. In essence, the government pays out to increase energy conservation measures, through grants, whilst the consumer pays directly for the Renewable Obligation Certificate Scheme (ROCs) and for increased transmission costs through electricity charging. **However, the Green Deal approach is a development which is welcomed by the Trust and which will go some way towards addressing this problem.**
11. Moreover, conservation and generation policies often involve different U.K governments and it is easy to see why, so far, there seems to be little move to look at what the returns are, in each case, for the various “subsidised” initiatives - far less any attempt to rationalise the overall approach to gain the most per pound spent. This contrasts considerably with government recognition in other areas of spending that best value must be obtained for the public pound.
12. **Policy consideration should include gains in both greenhouse gas (GHG) reductions and energy equivalency – whether that energy comes from production or energy saving measures.** In terms of real problems and real solutions, it should not matter whether that pound is from the consumer directly or from the government, from taxes. But unfortunately, in political acceptability, it has been very significant and resulted in massive over-emphasis on electricity production, especially wind power production.
13. **The UK energy policy needs to deliver the following aims:**
- **A secure, adequate and affordable energy supply**
  - **The required reduction in greenhouse gas emissions**
  - **Protection of our local and global environment**
14. Such a strategy should be developed alongside devolved governments’ energy strategies to ensure that there is vertical and horizontal “join-up” across governments and departments - rather than policies developed in “silos”. **Reform of the electricity market needs to take the above principles into account.**
15. There is excessive focus on “renewables” targets as if they are an end in themselves and this is reflected in the narrow approach of the Consultation. **The renewable energy targets are secondary in importance to the greenhouse gas emissions reduction targets and the need for an adequate, affordable energy supply.** If renewable energy production is developed in such a way that it is not delivering these primary aims of a secure, affordable energy supply which is sustainable and contributing to GHG emissions reductions, then government policies need to be revisited. It must be remembered that an adequate energy supply is much easier to gain if energy consumption is reduced and that consumption reduction measures, such as roof

and wall insulation, are about three times as efficient as electricity generation, whether that be onshore wind, nuclear or thermal.

16. Unfortunately, subsidies have been primarily focused on generation, rather than energy conservation. It is essential that the UK government redress this focus. Millions of lives could be improved by a reduction in their need for energy – by both energy conservation measures and by reducing the need to use fuel to travel to work. Policy areas such as planning and transport must work with DECC to achieve these aims. For instance, to reduce essential travel requires the construction of genuinely sustainable communities with work within their community - rather than dormitory suburbs and villages which have few essential facilities or work opportunities.
17. It is critical that the government looks beyond “renewable opportunities” to the whole energy balance and also looks at how planning regulation is, or is not, contributing to the primary aims outlined above. It is quite common to see Strategic Environmental Assessments – for instance, for local development plans – which clearly state that there are likely to be significant negative effects, for instance, due to road development and housing developments remote from work opportunities, but for that SEA to be ignored as the plan development progresses.  
**Transport and housing developments are very significant factors in energy use.**

#### **CURRENT MARKET ARRANGEMENTS**

**Q1. Do you agree with the Government’s assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?**

18. **No.** The economics of this will be a significant burden upon those who are paying for it. However, this question is misleading in that it is not the market which is supporting the investment – it is consumers through the ROCs and transmission cost recovery mechanisms.
19. The John Muir Trust believes that this consultation paper has some significant omissions with regard to the consumer interest. There is very little reference to the actual costs to consumers, but rather references to the suggested reforms leading to “consumer bills that are lower than continuing with existing policies”. This is hardly a re-assuring approach – comparing two slightly different scenarios when it is quite possible that neither of them is adequate.

**Q2. Do you agree with the Government’s assessment of the future risks to the UK’s security of electricity supplies?**

20. **The Trust welcomes the recognition that Security of Supply is at risk. The Trust does not believe that this consultation adequately addresses the issue.**
21. Data which has recently been collated from the NETA website demonstrates that **wind production has been much less effective in the last two year than was predicted.** The degree of difference between predicted and actual wind production; the extensive spread of low wind problems across the UK when certain conditions occur and the evidence of major swings from high to low production in very short time periods all combine to mean a requirement of very

significant back-up plant. It also brings into question a lot of the assumptions about what a high renewable percentage in the electricity portfolio can deliver.

See attached draft summary of 2009-2010 data.

### Transmission Issues

22. There has been considerable discussion about reducing transmission charges for generators remote from the bulk of the consumers to “go where the wind blows”. In fact, this makes no more sense than subsidising lamb producers in Shetland by paying for their produce to be flown to London to go “where the grass is”. Transport costs, whether of produce or electricity, fall on someone. In the case of electricity, it falls on the consumer one way or another. So the Trust disagrees with the premise put forward by the Scottish government that “postage stamp charging” or a similar mechanism should be introduced.

23. The actual costs of transmission are not carried fully, even under the present system, by the electricity generators but are primarily a cost put directly onto UK electricity consumers. Bringing in a flat rate transmission costing system would be a further indirect tax on consumers (alongside the Renewables Obligation mechanism) which would go to subsidise private electricity companies who would have a further incentive to locate their wind development where land is cheap, including unspoiled, peat-rich wild land (which is currently locking up carbon deposits), rather than locate industrial-scale generation near to where it is required, i.e. the centres of population.

24. It is frequently argued that locating in remote places such as the Western Isles, and then subsidising the transmission, is justified because “that is where the wind resource is”. However, looking at the detail of an individual case can demonstrate that this is often not the case. In fact, **Professor Andrew Bain gave detailed economic evidence to the Muaitheabhal (in the Western Isles) Public Local Inquiry, demonstrating that the relevant proportion of the cost of the required subsea transmission cable to the mainland was NOT offset by the expected higher production (i.e. “load factor”)**. This was estimated using the load factor estimates commonly given by the industry then. The recent evidence (see below) suggests that those figures were probably high and so the analysis is likely to have been optimistic regarding wind output. **It is only because of the disconnected way in which costs and benefits are assessed by different governments or departments, or not assessed fully at all if they fall on consumers, that the additional costs are not clear.** So the UK government is responsible for approving increased spending on transmission through the regulator, Ofgem, but they do not need to find that money from their tax revenue, as the money is taken off electricity bills. Meanwhile, the Scottish Government is the planning authority in such a case in Scotland and wishes to approve such proposals to achieve renewable targets, and provide jobs - but the Scottish government does not have to find any of the money for the development or the transmission. Similar anomalies occur in the other UK countries.

**AVERAGE WIND GENERATION AS A PERCENTAGE OF PLATED CAPACITY,**

	NOVEMBER 2008 TO DECEMBER 2010
1ST NOVEMBER 2008 TO 31ST DECEMBER 2010	24.08%
2008 (NOVEMBER AND DECEMBER ONLY)	31.75%
2009	27.18%
2010	21.14%
2009 AND 2010	23.43%

**INCIDENCE OF TOTAL METERED GENERATION BELOW 10MW**

In the 791 days between 1st November 2008 and 31st December 2010, regardless of capacity being metered by National Grid at that time, generation fell below 10MW on 51 separate days for a total of 2563 five-minute periods. That works out an average once every 15.51 days for a period of 2.35 years.

**INCIDENCE OF TOTAL METERED GENERATION BELOW 20MW**

In the 791 days between 1st November 2008 and 31st December 2010, regardless of capacity being metered by National Grid at that time, generation fell below 20MW on 124 separate days for a total of 7339 five-minute periods. That works out an average once every 6.38 days for a period of 1.51 years.



**SUMMARY OF WIND GENERATION BY TIME, NOVEMBER 2008 TO DECEMBER 2010**

**BETWEEN NOVEMBER 2008 AND DECEMBER 2010 INCLUSIVE, FOR THE FOLLOWING VARIOUS COMBINATIONS OF METERED CAPACITY WHICH NATIONAL GRID CAN SEE,**

	NOV 2008 TO DEC 2010 INCL. DEC ONLY	2008	2009	2010	2008 AND 2010	% of the time
OUTPUT WAS 30% OF CAPACITY OR MORE FOR	33.44	47.22	30.59	24.82	31.29	% of the time
OUTPUT WAS BETWEEN 30% AND 20% OF CAPACITY FOR	21.76	9.14	33.96	32.08	33.80	% of the time
OUTPUT WAS BETWEEN 20% AND 10% OF CAPACITY FOR	78.65	35.94	18.24	33.25	28.91	% of the time
OUTPUT WAS BETWEEN 10% AND 5% OF CAPACITY FOR	15.47	18.89	34.64	37.28	35.92	% of the time
OUTPUT WAS BETWEEN 5% AND 1% OF CAPACITY FOR	9.79	9.85	8.85	10.08	9.78	% of the time
OUTPUT WAS BETWEEN 1% AND 0% OF CAPACITY FOR	5.86	5.88	4.83	5.86	5.86	% of the time
OUTPUT WAS LESS THAN 0% OF CAPACITY FOR	3.09	2.63	1.94	4.16	3.65	% of the time
THEREFORE,						
OUTPUT WAS 30% OF CAPACITY OR MORE FOR	33.44	47.22	30.59	24.82	31.29	% of the time
OUTPUT WAS LESS THAN 30% OF CAPACITY FOR	66.56	52.78	61.45	75.18	67.71	% of the time
OUTPUT WAS LESS THAN 20% OF CAPACITY FOR	67.56	61.84	67.55	61.38	64.72	% of the time
OUTPUT WAS LESS THAN 10% OF CAPACITY FOR	33.41	20.59	28.98	35.64	33.41	% of the time
OUTPUT WAS LESS THAN 5% OF CAPACITY FOR	27.64	18.59	14.95	28.24	27.89	% of the time
OUTPUT WAS LESS THAN 1% OF CAPACITY FOR	8.15	8.83	4.27	9.94	8.13	% of the time
OUTPUT WAS LESS THAN 0% OF CAPACITY FOR	3.09	2.63	1.94	4.16	3.65	% of the time

Table with multiple columns and rows, mostly illegible due to low resolution and blurring. It appears to be a detailed breakdown of the data presented in the summary table above.

