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Clerk of the Committee
Welsh Affairs Select Committee
House of Commons
London

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Dear Sir:

ENERGY IN WALES: RESPONSE OF THE RENEWABLE ENERGY FOUNDATION TO THE WELSH AFFAIRS SELECT COMMITTEE'S CALL FOR EVIDENCE

Introduction

We are particularly mindful that the topic of renewable energy will assume for many an over-riding importance in the Select Committee's inquiry, principally because of its bearing on global efforts to tackle climate change. However, misconceptions of the United Kingdom's role in these global efforts are prevalent, and consequently the role of renewables itself tends to be incorrectly assessed. These misconceptions not only mitigate against successful climate change policy, but also against a successful long-term future for renewable energy. It is imperative, then, to be clear at the outset with regard to realities and practicalities.

The United Kingdom emits roughly 550 million tonnes of CO_2 per year.[1] This is roughly 2% of the global total of 24,000 million tonnes.[2] It should be immediately apparent that the United Kingdom has no quantitative role in global climate change policy, but instead can contribute by:

- Demonstrating and exporting good practice, and through
- Providing an economically compelling example.

Rapid growth in the developing world further emphasises this point, and may be conveniently indexed via electricity. China is at present approximately five times the size of the UK electrically, with an installed capacity of roughly 357 GW, generating approximately 1,800 TWh.[3] The UK has an installed capacity of roughly 74 GW and

[1] For latest emissions data see DEFRA: http://www.defra.gov.uk/environment/statistics/globatmos/gaemunece.htm
[2] Current estimates can be obtained from the Energy Information Administration of the US Dept. of Energy: http://eia.doe.gov/.
[3] See International Energy Annual data on: http://www.eia.doe.gov/emeu/iea/

generates around 400 TWh per year. By 2020 it is estimated that China will need to generate some 11,000 TWh, with an installed capacity of approximately 2,400 GW.[4] **In other words, by 2020 China will have grown sixfold electrically and be some 30 times the size of the UK in this sector.** While nuclear and hydro-electrical power will provide a considerable portion of this energy, the bulk is expected to come, necessarily, from coal and gas.

Seen against such backdrop, it is obvious that the United Kingdom climate change and energy policies will be at best futile unless they are *economically* attractive and sufficiently practical to induce emulation in China. Consequently, as we have emphasised in our 2005 Manifesto, it is essential to recognise that the goals of the 2003 Energy White Paper must be prioritised correctly, and this sequence may seem counterintuitive.

It is widely agreed that energy must demonstrate favourable credentials in a number of areas, and ideally should be:

- Secure
- Reliable
- Economical
- Clean
- Sustainable

However, it should be noted that these are the qualities we wish to be characteristic of the overall energy portfolio. It is not enough that the various component technologies of our portfolio should demonstrate them individually; each technology must manifest these qualities in such a way that

1. the ability of other technologies to deliver their benefits is not impaired, and
2. the value of the energy sector as a whole is not seriously compromised.

We suggest that the criteria should be arranged in the sequence given above, reflecting their priority and consequence. The logic of this sequence can be explained as follows:

If security of the primary sources cannot be guaranteed, then reliability at the point of use is questionable;

If security and reliability of supply are compromised, then our economy will be damaged;

If our energy supplies are insecure, unreliable, and unaffordable we will be unable to maintain and develop the high technological economy necessary to support our social aims and control the emissions of a large urban and industrial society.

[4] See statements by Zhang Guobao, vice-minister of the National Development and Reform Commission quoted in the *China Daily*, 19 Oct. 2004: http://www.china.org.cn/english/BAT/109757.htm

If the energy system in its total sense is unclean, as is seen in the CIS countries and parts of the developing world, then our social aims will be compromised by ill health in our population.

And finally, if we cannot achieve any of the foregoing aims, our overall energy policy will be unsustainable, and the well-being of the United Kingdom and its people will be poorly served in the short, medium, and longer term.

We emphasize that this sequencing and logic differs radically from that found in the *Energy White Paper*, which we believe is gravely and dangerously flawed.[5] In particular we note that the *White Paper* foregrounds emissions abatement as the principal goal, and allows other goals to settle into subordinate positions in no particular order. In criticizing this policy framework, the Renewable Energy Foundation is not suggesting that emissions abatement is unimportant, but, rather, that placing it centre-stage is likely to compromise our ability to reach other essential objectives.

From the above analysis we conclude that there is no *necessary* conflict between **1. configuring our energy policy to serve our own economic needs, and 2. fulfilling our international responsibilities in relation to climate change**. Indeed, emphatically, if the energy policy promises economic disadvantage it will by the same token be ineffective as a climate change policy because it will fail to carry the developing world in the same direction. The importance of this conclusion cannot be underestimated, and we commend it to the committee as a founding principal on which sound analysis can proceed, and we believe it informs our further comments below.

In structuring these remarks we have followed the outline of the published Terms of Reference. Our purpose has been to comment briefly each of the issues, highlighting documents and information sources that, in our view, would be profitable reference points for the Select Committee.

1a. UK Government policy in relation to the current and future energy needs of Wales

It is a matter for concern that the UK energy policy is not regionally tailored, and tends to regard the renewable energy resources of Scotland and Wales as common UK properties to be exploited at will. While the overall national good may be seen as having weight in this context, we would suggest that, particularly in regard to renewable energy resources, this breaches what should be a golden rule of sustainable development; namely, that *a development should be beneficial to all parties at the relevant proximate level, and that distal benefits should not be invoked*.

[5] See, for example, *Energy White Paper: Our Energy future: Creating a Low-Carbon Economy* (Dti: London, 2003), pp. 7ff.

In our response to the *Energy Wales: Route Map to A Clean, Low-Carbon and More Competitive Energy Future for Wales*[6] we discussed this matter in some detail, noting with great pleasure Andrew Davies' remark on sustainable development:

> *In its fullest meaning, sustainable development is a powerfully humanist concept centred on the needs of individuals, families and communities within the environment they inhabit.*

We observed that it would be welcome, in the light of Mr Davies' remarks, if policy were clearer in its emphasis on the need to ensure that renewable energy development delivered secure and certain local benefits. Too often, in our view, the sustainability of a development is justified in terms of its action at a distance. In the case of renewable energy this is usually described in terms of its mitigation of climate change. However, this is too simplistic a measure of sustainability, and fails to fulfil the spirit of Mr Davies' admirable description or to encompass and substantiate benefits for the local community. The benefit of such a refinement of the concept is that it enables the necessary discrimination between proposals which are locally damaging, though with benefits at a global level, and developments which are beneficial at every level.

Restating this: we may think of this problem in terms of three nested benefits.

- Rural contributions to Welsh energy needs
- Welsh contributions to the UK's energy needs
- The UK's contribution to global climate change policy

As an axiom, or a Golden Rule, we may state that the **Contributor at each level must benefit *at that level*.** Thus, rural areas which host renewable energy developments must benefit at the rural, local, level. Wales will necessarily make a contribution to UK needs, but must benefit at its own level in addition to benefiting indirectly from the higher levels.

This method of evaluation would help to ensure that sustainable development is, in fact, "centred on the needs of individuals, families and communities". With this in mind we recommended that the policy and the route map are revised to place community benefit at the centre of renewable energy development. We believe that this is most pertinent in relation to renewable energy developments, which have most to offer at a community level.

1b. UK Government policy in relation to the current and future provision of energy in Wales.

We have argued in our response to 1a above that the provision of energy *in* Wales should be seen more in terms of its relation to Welsh needs, and that this is

[6] Renewable Energy Foundation, *Energy Wales: Route Map to A Clean, Low-Carbon and More Competitive Energy Future for Wales* (23 Aug. 2005). Available from http://www.ref.org.uk/images/pdfs/ref.energy.wales.response.pdf

particularly true of renewable energy developments, which are becoming dangerously disconnected from the general interest in Wales.

2. The relationship between the UK Government and the National Assembly for Wales – including the division of powers – on energy policy

It is our view that, bearing in mind the fact that renewable energy developments have most potential at local level, renewable energy is best and most tactfully handled by the National Assembly, in order to ensure that the Golden Rule of sustainability, outlined above, is observed.

However, in relation to the provision of policy for conventional energy we consider that it is at least arguable that the National Assembly should accept the need to work in partnership with central government. This would enable the National Assembly to retain influence and control, without shouldering the people of Wales with the very high costs of determining such policy.

3a. The current and future portfolio of energy provision in Wales: Nuclear Energy

The Renewable Energy Foundation is neutral on the nuclear issue. We do however, judge, that a manifestly full and transparent public debate is required so that the UK and its people can reach a sound decision in prompt order, either to proceed with new nuclear stations on old sites, or to stabilise the conventional energy sector to ensure that there is appropriate investment in coal and gas with Carbon Capture and Sequestration (the only viable alternative to a nuclear component in the short and medium term), with as large a contribution from firm generating renewables such as biomass and tidal systems as is feasible.

3b. The current and future portfolio of energy provision in Wales: Liquefied Natural Gas

The Renewable Energy Foundation was an early voice arguing against too heavy dependence on gas, noting that this distortion in the portfolio was a direct outcome of unrealistic expectations for renewables. We maintain our position on this issue, but recognise that LNG is a valuable element in the portfolio, if correctly scaled, and that there may be wealth-generation opportunities for Wales in handling its importation, though we note that there are safety concerns in regard to the vulnerable populated area around Milford Haven.

In relation to Carbon Capture and Sequestration (CCS) see below in our remarks on clean coal.

3c. The current and future portfolio of energy provision in Wales: Clean Coal Technology

The Renewable Energy Foundation recognises that fossil fuels will necessarily continue to provide the bulk of energy for Wales, and the UK, for some time to come, and that even the most ardent proponents of renewables must show social responsibility and acknowledge this necessity as a reality. Ensuring that this fossil fuel is used efficiently and without emissions is therefore essential. We therefore have recommended Carbon Capture and Sequestration (CCS), particularly for

Enhanced Oil Recovery, where possible. We would advise the Select Committee to interpret the reference to "Clean Coal" in this section to cover not only the fitting of Flue Gas Desulphurisation (the conventional understanding of the term "clean coal"), but also CCS.

Wales has remaining reserves of coal, and is a likely beneficiary of the now inevitable coal rebuild in the UK's portfolio. Furthermore, Welsh manufacturing is a potential beneficiary from any export drive for CCS technology, to China for example.

We note also that the Select Committee may wish to seek expert advice on advanced methods for extracting Welsh coal resources, particularly the potential for Underground Gasification. World-leading technology is currently available in the UK, which also has particularly suitable geology.

3d. The current and future portfolio of energy provision in Wales: Wind Farms

The Renewable Energy Foundation is a well-known and outspoken critic of the current policy's over-dependence on wind energy. We refer the Select Committee to the many publications revealing evidence from Denmark and Germany now confirming that wind energy is at best a fuel saver, and offers only a very low "capacity credit" (the ability to replace "firm" capacity in the portfolio). We are aware that Mr Graham Sinden of the Oxford Environmental Change Institute is currently arguing that conditions in the UK are so different that European experience is irrelevant to the UK. These theoretical claims are tendentious, vague, and lack credibility when compared with the empirical experience of our European neighbours. We therefore urge the Select Committee to examine both the E.ON Netz 2005 report and the recent articles in *Civil Engineering* by Hugh Sharman.[7]

We have argued at length that the currently unbanded structure of the Renewables Obligation has resulted in an unbalanced investment scramble for the least capital intensive ticket to the revenue stream, regardless of the intrinsic value of the technology adopted. Wind power undoubtedly has something to offer, but current levels of proposed development, particularly in Scotland and Wales, are irrational, and do not constitute a wise use of scarce capital.

It is regrettable that the wind industry has been, to say the least, overenthusiastic in estimating the technology's benefits, and has tended to greatly underestimate the difficulties of managing stochastic generators, and as a consequence has misled both policy makers and public alike. A good example of this is the unfortunately biassed report of the Sustainable Development Commission, which has been described by one authoritative commentator as cheerleading boosterism for the wind industry.

REF has argued in favour of a revision of the Renewables Obligation to offer more to technologies which themselves have more to offer, and we are thinking principally of Biomass and Tidal energy, which are capable of firm generation, and we urge the Select Committee to pay particular attention to the influence of the

[7] REF's abstract of the E.ON report is available from www.ref.org.uk, and the full report http://www.eon-netz.com. Hugh Sharman's papers, 'Why Wind Works for Denmark', *Proceedings of ICE: Civil Engineering*, 158 (May 2005), 66-72, and 'Why the UK should build no more than 10 GW of Wind Capacity', *Proceedings of the Institution of ICE: Civil Engineering* 158 (November 2005), 161-169, are available in pdf format on request.

Renewables Obligation on investment patterns in renewable energy, and to the way in which the RO has contributed to a destabilisation of the overall energy sector.

3e. The current and future portfolio of energy provision in Wales: Biomass Energy

The potential in Wales for biomass energy sources, for transport, heat, and electricity is very considerable, and promises truly sustainable benefits. The current poor state of development is almost entirely the result of flaws in the Renewables Obligation, which has over-focused attention on the electricity sector, at the expense of transport fuels and heat, and penalised technologies such as biomass which though of high merit require high capital investment and expert planning.

3f. The current and future portfolio of energy provision in Wales: Geothermal Energy

The true potential for geothermal energy in the UK, and in Wales is still unclear. REF's position is that this technology deserves research funding, and should be treated with an open mind.

3g. The current and future portfolio of energy provision in Wales: Tidal and Wave Energy

REF is sceptical with regard to wave energy, which resembles wind power by being stochastically intermittent in relation to patterns of demand. Furthermore, we are concerned that the strains on plant installed at the interface between air and water will be very considerable, shortening life-expectancy and increasing operation and maintenance costs. Nevertheless, an open mind is wise on this matter, and a number of demonstration plants are now in the process of testing.

With regard to tidal energy the situation is entirely different. Tidal energy is, other than biomass for electricity, far and away the most promising of all the renewable technologies. Tidal systems are intermittent, but extremely predictable, and their output can therefore be planned into the system with a high level of confidence far into the future, thus maximising utility. We believe that the failure to fully explore and incentivise tidal systems is perhaps the single greatest flaw in current policy viewed from a UK level perspective. From a Welsh perspective the failure to ensure that tidal energy projects are brought forward borders on the disastrous. Wales has numerous, outstanding, tidal opportunities, both for tidal empoundments (lagoons as Tidal Electric Ltd call them) and for tidal stream devices. Such systems, if successful, could contribute meaningfully to Welsh energy needs, with "firm" power, while at the same time becoming an integral part of the Welsh economy.

3h. The current and future portfolio of energy provision in Wales: Hydro-electric Energy

Opportunities for acceptable hydro-electric power are largely exhausted in Wales, and we are unconvinced that the balance between the impact and benefits of further projects would be favourable. We believe this is particularly so since extremely

promising alternatives such as biomass and tidal systems have much to offer to Wales.

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