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Re: Response to 'Transmission investment and renewable generation Consultation document October 2003'

Dear Ms Hunt,

1 Please find below my response to the above consultation.

2 Summary

- 2.1 In general I find that, in the absence of any spatial strategy for renewables generation whatsoever, these grid upgrade proposals and any changes to the regulatory framework are premature. As they stand, these reinforcement proposals unreasonably separate generation from load, will increase transmission losses, and will result in very inefficient utilisation of expensive transmission assets.
- 2.2 There is no strategic environmental assessment accompanying these reinforcement proposals, and consequently no evidence that they offer the best environmental option amongst the possible alternatives. And there is no evidence that the magnitude of the planning and political risks that currently surround onshore wind developments have been competently or realistically assessed.
- 2.3 These grid upgrade proposals appear to offer very poor value for money and will unnecessarily increase fuel poverty. Consumers' money will be committed to expensive and likely unproductive grid reinforcements at a time of already rising electricity prices. The wind industry and its supporters unreasonably expect the consumer to pick up the bill for the additional cost of the Renewables Obligation, the additional cost of the grid upgrade, and the additional cost of excessive transmission losses. Ofgem has a duty to satisfy itself that these reinforcements are in the best interests of consumers, rather than in the interests of particular private political and commercial agendas.
- 2.4 Therefore I request that Ofgem continue to rely on the existing price control regime for the time being. However, in order that the present shambles does not persist until the time of the next scheduled price reviews, I would strongly recommend that Ofgem ask the Government to provide a coherent spatial strategy for renewables, informed by the appropriate Strategic Environmental Assessment.

3 Lack of spatial strategy for renewables

- 3.1 By its intrinsic nature any network infrastructure requires a coherent overview. To take an analogy, it makes no sense to build a motorway network without having regard to where proposals for new towns are likely to be located or whether new towns will even be likely to be granted permission. Likewise, grid reinforcement designed to accommodate renewables generation cannot reasonably and effectively be planned without a clear spatial strategy for the location of that generation.
- 3.2 The Government is currently promoting offshore wind developments, and consulting on changes to the planning regime in England and Wales designed to facilitate renewables project approval. How do these initiatives fit in with renewables projects in Northern Scotland? Are they additional, or alternative? What is the total capacity of all of these projects and what is the total cost of the grid reinforcements they will require? Which is the most efficient mix of technologies and locations? Which alternative or mix carries the minimum cost to consumers and the environment? All of these (and more) are relevant and important questions that remain unanswered.
- 3.3 Ofgem has a responsibility to see that future developments in the energy sector will be sustainable. A sensible spatial strategy informed by a Strategic Environmental Assessment would help to address these concerns. It is more appropriate at this stage that Ofgem request these measures before changing the regulatory regime on an *ad hoc* and speculative basis.

4 Planning risk

- 4.1 Estimates based on connection requests to the grid operators are not a reliable indicator of future grid utilisation. It is necessary to examine in greater detail the planning risks associated with renewables proposals.
- 4.2 In Northern Scotland there are growing concerns regarding cumulative impact of renewables developments and, with a large number of MOD and environmental constraints in the area, most preferred locations are already the subject of development proposals. I believe that these constraints are evident in the marked slow down of quotation requests apparent in Figure 3.1 of your consultation document '*Transmission Investment and Renewable Generation October 2003*'.
- 4.3 The fact that most current proposals are at preferred locations notwithstanding, the rate of progress of applications has been extremely slow. At Ben Aketil in Skye, an application lodged by *Renewable Development Company* in July 2002 remains undetermined, and there is still no date fixed for hearing. Also in Skye, an application by *AMEC* for a wind farm at Edinbane was lodged in March 2002 and there is still no grant of permission. *AMEC* and its associates have threatened legal action in the Scottish Land Court to remove Crofting tenants from the site, and I understand that local residents have warned Highland Council that there will be a legal challenge in the Scottish Court of Session to any grant of planning permission. If progressed, these legal actions are likely to be contested and protracted.
- 4.4 With regard to proposals specifically requiring reinforcement to the Western Isles, there are currently three: *AMEC* (Barvas Lewis); *Scottish and Southern* (Pairc Lewis); and Eisken Estate (South Lochs Lewis), developer to be announced.

- 4.5 AMEC's proposal falls largely on the Lewis Peatlands Special Area of Conservation, the Lewis Peatlands Special Protection Area, and on land designated under the Ramsar Convention. Approval will require the consent of the European Commission and of the Ramsar Parties. Recent efforts by AMEC to move some turbines away from these designated areas and into close proximity with settlements will exacerbate rather than alleviate AMEC's planning risk in Lewis.
- 4.6 *Scottish and Southern's* Pairc proposal and the Eisken Estate proposal are both in close proximity to the North Harris Mountains Special Protection Area, and the sites of these proposals are heavily utilised by Golden Eagles and White-tailed Sea Eagles.
- 4.7 Furthermore, AMEC's Lewis proposal falls in part on Galson Estate, and *Scottish and Southern's* Pairc proposal falls on Pairc Estate. These estates are likely to be the subject of hostile community buyout bids under new and untested Land Reform legislation. Any legal action here is also likely to be contested and protracted.
- 4.8 In those cases where applications have proceeded to determination, it must be noted that the rate of rejection has recently significantly increased in Northern Scotland. Following a run of 100% approval, the latest determinations are a rejection by the Highland Council of *CRE/Scottish Power's* Borrowston Mains (Dounreay) proposal, and a rejection by Moray Council of the *Renewable Energy System's* Hills of Towie proposal. The 'honeymoon period' of wind farm approval by local authorities appears to be already over in the area.
- 4.9 These examples serve to illustrate that proposals for renewables in the Northern Scotland have largely run into the sand of the planning system. There is no evidence that the grid operators have competently analysed this risk in arriving at their projections. Planning risk is significant and increasing, and the industry's estimates based on requests for quotation are a hopelessly over optimistic measure of the likely renewables capacity that will eventually be connected.
- 4.10 In response to the 'chicken and egg' argument that utilities will not seek permission where grid availability is limited, I refer you directly to AMEC and *Scottish and Southern's* present activities in Lewis, which is currently connected to the mainland grid via a 33kV circuit. I also refer you to the analysis commissioned of IPA Energy Consultants by Comhairle nan Eilean Siar and the Highland Council into the economics of renewable energy¹. Assuming a continuing Renewables Obligation beyond 2010, this study finds a pre-tax annual rate of return on investment in a 100MW onshore wind farm to be 15.9%, which is sufficient incentive for any developer, without further speculative subsidy from the hard-pressed consumer.
- 4.11 In support of my planning risk argument, I also refer you to the recent statement by The Royal Town Planning Institute:

*"...it is quite clear that there will be nothing smart or successful about a wind farm strategy without a clear spatial framework."*²

¹ Highland Council, *Sustainable Development Select Committee Meeting*, 5 November 2003

² The Royal Town Planning Institute Scotland, *Windfarm Petitions To The Scottish Parliament, Briefing Note On Planning Issues*, paragraph 9. www.rtpi.org.uk/resources/policy-statements/2003/sep/pol20030957.pdf

- 4.12 It is apparent that the Government has abdicated its responsibility for strategic planning to the vagaries of the market place and the planning system. If such a protracted and uncertain procedure is to be the Government's preferred method for determining renewables location, then consumers should not be expected to gamble their money now on *ad hoc* and speculative grid reinforcements, before the outcome of this lottery is known.
- 4.13 A coherent strategy would address many of these concerns. However, under the current unsatisfactory circumstances, I request that Ofgem defer regulatory change until there is sufficient approved capacity to justify productive grid reinforcement. It is to be hoped that the situation may become clearer by the time of the next scheduled price review, although in the absence of any spatial strategy Ofgem should monitor these continuing and deteriorating planning risks, and be aware of the potential for protracted legal actions arising from this policy shambles.

5 Political risk

- 5.1 Financial analysis made under assumptions of a long-term Renewables Obligation indicates that onshore wind is an extremely attractive investment. However, even where proposals have received approval, there has been some reluctance for investors to subscribe. This reluctance is largely due to the absence of provision for the Renewables Obligation beyond 2010, and the perceived political risk that future administrations may cut off renewables support.
- 5.2 This political risk is increasing. A recent motion³ tabled in the Scottish Parliament called for a moratorium on wind farm development, and was supported by Conservative and Scottish National Party MSPs. Also, in response to public petitions the Enterprise and Culture Committee of the Scottish Parliament will shortly examine renewables with particular attention to the lack of any coherent strategy and strategic environmental assessment⁴.
- 5.3 Despite this growing unease, the Government still declines to take a strategic approach. The Renewables Obligation remains a short-term guarantee, and the Scottish Executive and the Energy White Paper talk vaguely of renewables aspirations after 2010, rather than of hard targets. The Government prevaricates over new nuclear build - there will be no decision until after the next general election. And with Russia's recent statements, prospects for the number of ratifications required to bring the Kyoto Protocol into force look more doubtful than ever.
- 5.4 Such a high level of political uncertainty is highly damaging to the prospects for renewables, and consequently for investment in renewables. Renewables require significant levels of subsidy in order to be profitable - more than £1BN of consumers' money annually by 2010, according to the Energy White Paper. Consequently Government dithering is likely to further reduce the number of projects that are constructed, permission notwithstanding.
- 5.5 Like planning risk, this political risk is significant and increasing as the decision date for new nuclear build and the 2010 date for Renewables Obligation cut off are approached. There is no evidence that the grid operators have competently analysed this political risk in their projections. If the Government is not prepared act to reduce political risk to a level necessary to encourage sufficient investment, then neither should consumers' commit to speculative grid reinforcements at this stage.

³ www.scottish.parliament.uk/plenary/or-03/sor1106-02.htm#Col3100

⁴ www.scottish.parliament.uk/news/news-03/cent03-002.htm

6 Inefficient use of transmission assets

- 6.1 The Government's preferred renewable technology, onshore wind, has a load factor of approximately 30%. In order to deliver this average load factor, the grid has to be able to transmit maximum output when it is available.
- 6.2 For example, for a 100 MW wind farm, the average power output is 30 MW, which is the average of periods when the wind farm delivers 100 MW (optimum wind resource), 0 MW (worst case wind resource), and of course, everything else in between these extremes.
- 6.3 Therefore, in order to achieve a 30% load factor, the grid has to be capable of accepting maximum output from wind farms when wind resource is optimum. Thus a grid asset that serves only wind farms will only be utilised on average to 30% of its capacity, ie 70% of the asset is redundant. That is a very low level of utilisation for such an expensive asset, and an unacceptably poor investment of consumers' money.
- 6.4 Shallow connection contracts merely shift this inefficiency from the grid to the wind farm, since for a shallow connection policy to efficiently utilise the grid, wind farm load factor is reduced as a result of constraining off during optimum wind resource conditions. Either way, the consumer ultimately pays for this inefficiency.
- 6.5 There has also been speculation that the 70% redundancy of the grid asset will be utilised by other wind farms, and by wave generation to be installed at some unspecified time in the future. However, it is necessary to critically examine such claims.
- 6.6 Because of the average size of the dominant weather systems in the Northern Scotland (Atlantic depressions), there is a high level of coherence in the wind resource across the region. This will lead to the synchronization of wind farm output.
- 6.7 Even when wave generation eventually becomes feasible, wave generation is also to some degree synchronised with wind generation, since it is the wind that causes the waves at sea. And likewise hydro is coherent with wind and wave, as rainfall is also correlated with the dominant weather systems. (Damned hydro may have the advantage of some limited buffering capacity, depending on reservoir size). Of the renewable technologies, only tidal and solar are asynchronous with wind in Northern Scotland, but these are not arbitrarily controllable, and their feasibility remains to be demonstrated.
- 6.8 Rather than improve the efficiency of the grid asset, the connection of additional coherent renewable generation exploiting wind, wave and hydro may well exacerbate the grid inefficiency problem, and not solve it.
- 6.9 Therefore it is clear that to use grid assets efficiently and have a large capacity of wind generation connected in any particular region, wind farms must be accompanied by other forms of generation storage that are capable of short notice control, such as gas turbines, or pumped storage.
- 6.10 However, the only gas-fired generation in the Northern Scotland is on the east coast at Peterhead, and the only pumped storage facility is at Foyers. There is no significant controllable generation at all on the west coast or in the Western Isles.

- 6.11 Without a spatial strategy, it is unlikely that any arrangement consisting of a large number of wind farms matched with generation capable of short notice control will ever be achieved in the Northern Scotland. As a result, consumers are being asked to pay for very expensive transmission assets that will only be used to approximately 30% of their capacity.
- 6.12 As a further important point, I understand that there already exist in the UK redundant grid assets that are more than sufficient to accommodate renewables. I refer you to PB Power's report to ETSU concerning the Western Offshore Transmission Grid Concept Study⁵, which states:

"5. Existing transmission system capability in the North of the UK largely reflects historic and predicted power flows and therefore, if significant amounts of renewable generation is to be superimposed on the existing system power flows, reinforcement will be required unless equivalent existing generation in the area is displaced. The same is not true of the transmission network below the principal Midlands to South constraint, particularly so in the South West and South Wales, where significant capacity exists (3 - 6 GW) to accommodate additional generation or imports from elsewhere in the UK connecting at these locations."

- 6.13 If it is correct that consumers have already paid for 3-6 GW of redundant transmission assets elsewhere in the UK, then I do not see why they should now foot the bill for additional expensive assets in Northern Scotland that will only be used to 30% of their capacity.
- 6.14 Moreover, the United Nations Framework Convention on Climate Change (UNFCCC) Article 3.3 has:

"policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost."

- 6.15 Locating renewables in Scotland to serve a load that is primarily located in England requires significant additional cost in infrastructure reinforcement and significant additional cost in transmission losses. If the Government proposes to do precisely this in the name of the Kyoto Protocol of the UNFCCC treaty then it is necessary for it to demonstrate that this is the option that carries the lowest possible cost. It is obvious to all that the Government has not made this case - perhaps because it is also obvious to all that this alternative is not the lowest possible cost option.
- 6.16 Consequently, I request that Ofgem seek from the Government a coherent spatial strategy that includes the matching of wind generation with controllable generation so that new and existing grid assets may be efficiently utilised. The Government should demonstrate that its preferred option is the lowest cost option, as required under international law. Ofgem should specifically ask the Government to explain why grid reinforcement is now necessary in Northern Scotland when existing transmission assets elsewhere in the UK are currently under-utilised.

⁵ ETSU/PB Power, *Concept Study - Western Offshore Transmission Grid*, Page 2.

7 Transmission losses

- 7.1 The reinforcement of the grid in Northern Scotland and the increase of renewables generation in that region that is so implied represents perhaps one of the greatest spatial separations of load from generation that is possible within the UK. Northern Scotland is already a net exporter of electricity, and any increase in output from the region will be exported over the grid to satisfy load further south. As such, the transmission losses will be highly significant.
- 7.2 Ultimately Consumers will pay for these transmission losses, as they will also pay for the grid upgrades that makes such excessive losses possible, not to mention the Renewables Obligation.
- 7.3 Ofgem should be satisfied that the additional cost to consumers of such a large separation of generation from load is both necessary and justified. Once again, only a coherent spatial strategy can properly balance the issue of transmission losses with other competing factors.

8 Security of supply risk

- 8.1 The high level of separation of generation from load exposes the system to unnecessary risk of severe interruption. Risks to extended infrastructure include climate change predictions of increasing frequency and intensity of storms, terrorist attack, and war. Whilst some risks are perhaps not imminent, it would be irresponsible not to take this opportunity to consider all available options when the grid and location of generation are being reconfigured for the future.
- 8.2 The issue of 'client-server' network reliability has been extensively studied in the information sector, and by analogy the 'load-generator' electricity network could and should profit from this experience. It is evident that a superior infrastructure model is the matching of distributed generation to load, as in embedded generation. This model reduces risk due to interruption of main transmission links and is capable of sustaining a high degree of damage before total failure.
- 8.3 Therefore I request that Ofgem ask the Government to take this opportunity to develop a robust electricity system more appropriate to the needs of the 21st century, rather than these unimaginative reinforcement proposals. Once again, this will require a coherent spatial strategy that includes proper consideration of security of supply issues.
- 8.4 **Lack of strategic environmental assessment**
- 8.5 It is difficult to see how these grid reinforcements will achieve sustainable development when there is no Strategic Environmental Assessment. The dispersed and extended nature and the scale of intended renewables development means that the cumulative environmental impact cannot be properly assessed on an ad hoc site-specific basis. The Government evidently recognises the benefits of such an assessment, since they have already commissioned one for the offshore wind program. The Government's failure to do likewise for onshore renewables in Scotland is indefensible.
- 8.6 A large number of renewables proposals in Northern Scotland are on blanket peat and in important bird areas. For example, AMEC's Lewis proposal is for the world's largest wind farm on Europe's second largest peat bog.

- 8.7 There is serious unease regarding the cumulative impact of wind farm development on large raptors, in particular Golden Eagle (UK population 400 breeding pairs), and White-tailed Sea Eagle (UK population 25 breeding pairs). A number of wind farms have already been approved and/or constructed in eagle habitat, and there exists no estimate of the cumulative impact on these species.
- 8.8 Peatlands are the most significant carbon reservoir in the northern temperate zone. It has been estimated that globally peatlands contain more carbon than all of the world's forests combined. This carbon is sequestered from the atmosphere during bog photosynthesis and locked down by waterlogged bog conditions that inhibit decay. Scotland has more than 10% of the world's blanket bog carbon reservoir, and the majority of this is in the North and West.
- 8.9 When undisturbed, these self-sustaining bog ecosystems balance the atmospheric carbon budget, by acting in negative feedback in response to changing climatic conditions. Wetter (warmer) conditions promote bog growth and waterlogging, and thus increase carbon sequestration and storage; whilst dryer (cooler) conditions promote the release of carbon back into the atmosphere. When peatland is artificially drained, such as by the network of drains that accompany wind farm service roads, the damaged bogs release large quantities of carbon back into the atmosphere.
- 8.10 I also draw your attention to Article 2 of the Kyoto Protocol:
- "Article 2*
- 1. Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:*
- (a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:*
- ...
- (ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol,..."*
- 8.11 It is simply not possible to assess the climate change benefit or otherwise of the Government's renewables program without proper assessment of the cumulative impact of these developments on peatlands, nor possible to assess the acceptability of the cumulative impact of these developments on important bird species.
- 8.12 Therefore, I request that in the interests of sustainable development Ofgem seek from the Government a competent Strategic Environmental Assessment for its onshore renewables and grid reinforcement intentions in Scotland. In the absence of any such assessment, I request that Ofgem take a precautionary approach, and maintain the current regulatory regime.

9 Lack of clearly defined benefits for consumers

- 9.1 I have already mentioned the likely failure to deliver sufficient renewables developments via the planning system to justify these grid reinforcements. It is therefore appropriate to ask the question: who will benefit from these reinforcements?
- 9.2 Clearly the grid operator *Scottish and Southern* has a strong financial interest in grid reinforcement in Northern Scotland. *Scottish and Southern* is a vertically integrated utility and a leading renewables developer, and the complexity of interests so engendered deserves careful and critical examination.
- 9.3 The grid operators' and wind industry's own 'chicken and egg' argument makes no secret that the intention is to provide grid assets in order to provide a *fait accompli* of available transmission capacity, in support of their own planning applications.
- 9.4 *Scottish and Southern* is pushing for grid reinforcement as soon as possible and without full examination of the likelihood of success of renewables projects in the area, or of the cumulative environmental impact. These wider considerations are likely call into question the wisdom and feasibility of these renewables projects and grid reinforcements. Consequently, a coherent strategy and Strategic Environmental Assessment is likely to expose *Scottish and Southern* to risk of reduced corporate growth.
- 9.5 The political pressure for a coherent renewables strategy is growing, and I note that European Union Directive 2001/42/EC (*On the Assessment of the Effects of Certain Plans and Programmes on the Environment*) will oblige member states to perform strategic environmental assessment of policy adopted after July 2004. I believe that this is the real reason why *Scottish and Southern* are so urgently pressing for regulatory change now, before the next scheduled price review.
- 9.6 There has also been concern voiced that there appears to be a revolving door between industry and the DTI, and the current Government advisor on renewables was until January this year the head of *AMEC's* wind business. The Government's use of policy advisors seconded from industry carries the risk of conflict of interest. Therefore Ofgem should take care to critically examine all DTI policy that has direct implications for specific renewables projects, in order to satisfy itself that such policy is in the interests of consumers.
- 9.7 Neither is it clear that political pressure for grid reinforcement to the Western Isles is motivated by considerations of energy policy alone, and Ofgem should also satisfy itself that such reinforcement is in the interest of consumers in general. The Western Isles is a marginal Westminster and Scottish Parliament constituency held by Labour. Government ambitions for expanding renewables manufacturing capacity at Arnish in Lewis and the use of subsidised renewables projects to sustain community ownership buyouts in the Western Isles are laudable aims, but they are nothing to do with energy policy. The use of consumers' money to support the Government's social and economic policy is effectively a hidden tax on electricity consumers.
- 9.8 In contrast, the benefits to consumers of these grid reinforcements at this time are obscure. With no coherent strategy or Strategic Environmental Assessment, there is no evidence that they will bring value for money or deliver the promised environmental benefits. It is the wind industry and the Government that are lobbying for an unprecedented revision of the regulatory framework, and therefore it is their responsibility to demonstrate beyond all doubt that their proposals are feasible, sustainable, and necessary.

- 9.9 From the point of view of consumers, these reinforcement proposals represent a 'triple whammy', whereby consumers are expected to pick up the bill for: the Renewables Obligation; the additional cost of expensive but questionable grid reinforcements; and the additional cost of unnecessary transmission losses. The burden of this cost will fall disproportionately on the poorest members of our society, and at a time of already rising electricity prices. Unnecessary fuel poverty is not in the interests of consumers or the nation.
- 9.10 The interests of the consumer and of industry are best served by sticking to the existing regulatory regime. Adjustment of the regulatory framework now will send the wrong signal to the renewables lobby, that the consumer is a 'soft touch' willing to pick up the bill for any and every whim of the renewables industry. Any *ad hoc* and unscheduled adjustments to regulation will further undermine confidence in the already weak electricity sector, since investors will no longer be able to trust the stability of the regulatory regime. Ofgem should resist pressure to follow every swivel of the political weather vane, and rather continue to establish and maintain a firm and clear regulatory framework with a guaranteed timetable.

10 Conclusion

- 10.1 The grid operator's estimates for future renewables capacity are unrealistic and do not competently provide for a number of highly significant risks.
- 10.2 The Government's 2010 renewables targets will not be met regardless of whether or not these reinforcements proceed.
- 10.3 The proposed grid reinforcements appear to have significant private political and commercial benefits, but they are not in the best interest of consumers.
- 10.4 A coherent strategy is required for renewables and a strategic environmental assessment is necessary in order to inform this strategy.
- 10.5 In the absence of any clear benefits to the consumer, Government policy, or the environment, Ofgem should maintain the current regulatory regime until the next scheduled price review.
- 11 I thank you for this opportunity to comment.

Yours sincerely

Dr Jeremy Carter