ALL-CLO-POE-02

The Mid Wales (Powys) Conjoined Public Inquiry into 5 Windfarm Proposals and a 132kV overhead Electric Line Connection

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Closing Session

Alliance Proof of Evidence

Brett Kibble

Planning Balance and Carbon Balance

Carbon Balance: Considerations of particular concern regarding Conjoined Inquiry schemes

1. Introduction

1.1 Having considered the carbon calculator and recent developments, the Alliance presents the case that the carbon balance calculations provided by developers are now oversimplified and outdated, omitting a number of relevant factors that led to an underestimation of the carbon payback time of windfarms.

1.2 Carbon balance is, of course, a material planning consideration that must be fully considered in the planning balance for all the submitted schemes. There has been increasing recognition recently of the issues that affect the carbon balance when constructing windfarms on peatlands and this is of particular relevance to most of the schemes before this Inquiry.

1.3 The removal of forest cover must also be factored into the carbon balance. This is not only germane to on-site removal of coniferous plantations but also to the removal of roadside trees and hedgerows to facilitate parts delivery and to the erection of the necessary transmission infrastructure. The installation of the Llandinam Line alone will lead to the felling of in excess of 1,200 trees. This must all be considered as part of the planning weight given to possible carbon savings from the operational windfarms both individually and collectively.

1.4 The Alliance evidence draws attention to issues of concern and we would request that they are fully considered in the decision making process.

2. Forest Cover

2.1 The UK Forestry Standard 2011 is, as the Natural Resources Wales (formerly Forestry Commission Wales) website acknowledges: *'the most important standard that applies to forestry in the UK'.*

2.2 This standard has the following entry [1]: '*The removal of trees may also take place to enable development, authorised under the planning regulations, to proceed. Such developments may include alternative sustainable land use such as windfarms or hydroelectric schemes. In such cases, all the arguments, including impact on climate change through loss of forest cover, will need to be addressed within the framework of woodland removal policies at country level and the planning legislation.*'

2.3 Clearly, carbon loss due to the removal of forestry to accommodate windfarms must be included in any carbon balance.

3. Peat

3.1 The effect upon the carbon balance of building windfarms on peatlands has become better understood in recent years and various research has been published (see below) and used in the carbon balance equations.

3.2 The issue of peatlands is very important to the inquiry as:

3.2.1 Llanbrynmair: The August 2013 SEI states that 65% of the infrastructure is on peat [2].

3.2.2 Carnedd Wen: The opening submission by NRW for the Opening Session states *'In the case of Carnedd Wen, at least 80% of the application site is on deep peat and in the context of sites subject to actual or planned windfarm development in Wales, it is exceptional*' [3].

3.2.3 Llaithddu: Although this windfarm is not located in such a rich peat area the access tracks still require the removal of 13,772 cubic metres of peat and the crane platforms 3,588 cubic metres [4].

3.2.4 Llandinam: Celtpower's proof of evidence on ecology shows that 10.08 ha of peatland will be lost [5].

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[1] The UK Forestry Standard: The government's approach to sustainable forestry, Forestry Commission: Edinburgh, 3rd edition 2011, page 86, first paragraph
[2] Llanbrynmair August 2013 SEI, Non-Technical Summary, page 10, paragraph 1.8.3
[3] CON/003/004, 12th page, paragraph 4.2.3
[4] Fferm Wynt Llaithddu June 2013 SEI, Volume 1, page 20, Table 2.5
[5] Celtpower Session 1 Proof of Evidence Ecology David MacArthur (CPL-ECOLOGY-POE-MACARTHUR-SSC-A) paragraph 3.11

4. Carbon Calculator

Developers use the Scottish Government's Windfarm Carbon Assessment Tool to calculate the carbon balance in their ES and SEIs. The Scottish Government website has an explanatory note [6] concerning the methodology for each topic considered and most issues are addressed. The Alliance, however, has concerns that in the following topic areas understanding has advanced or there are particular issues to be addressed for windfarms before this CPI.

4.1 Electricity fossil fuel and grid mix supply

4.1.1 The calculations in the 'Carbon Calculator' are based on the present fossil fuel and grid mix electricity supply. The University of Aberdeen [7], funded by the Scottish Government, used a more realistic fuel balance taking account of changing generation methods. Their paper states in the conclusion: '*Previous work (Nayak et al., 2010) has indicated that a benefit to terrestrial C stocks can be achieved by responsible management of sites and targeted use of resources to improve previously degraded (peat) sites. However, when projected changes in emission factors are accounted for, the potential for C saving is very much reduced and most peatland sites will show no net C saving*.'

4.1.2 It is the 2010 work by Nayak et al that led to the 'Carbon Calculator' that the developers use. However, as can be seen above, the Aberdeen research in November 2013, using a revised figure for emission factors, can make a high magnitude of change in the outcome of the carbon balance calculation.

4.2 Timescale of peatland restoration effects

4.2.1 The majority of the habitat management and peatland restoration effects in SSA B involve the removal of forest cover and the blocking of drains. Even if this were to be successful (the Alliance evidence ALL-SSAB-POE-05 shows otherwise), the carbon balance effects due to the restoration would be negative well past the lifetime of the windfarms. The report by Natural

[6] http://www.scotland.gov.uk/Resource/0044/00448589.xlsx

[7] Windfarms on undegraded peatlands are unlikely to reduce future carbon emissions; Jo Smith, Dali Rani Nayak, Pete Smith; University of Aberdeen, November 2013

England [8] when discussing forest removal and peat restoration states (page 25): '*After ~ 150 years or more peatland restoration would probably begin to deliver more greenhouse gas benefits than afforestation*'.

4.2.2 Obviously the precise timescale in each windfarm would depend on many factors but the positive carbon balance due to these issues cannot be claimed in the lifetime of the windfarm and certainly will not result in a negative payback time as is claimed by RES [9].

4.3 Windturbine Component Replacement and Whole Life Projection

4.3.1 The Carbon Calculator appears to assume that no major components of the turbines will be renewed in their lifetime. The experience in Wales and throughout the world is that this is a very unrealistic assumption. Also the carbon expended in ad hoc manufacture, repair and movements of very large and heavy components from suppliers and repairers to the site will be worse per item than the more efficient original bulk supply.

4.3.2 A life of 25 years is used in the 'Carbon Calculator' by the developers. Research carried out by G. Hughes, Professor of Economics at Edinburgh University, shows that the load factor of turbines in the UK drops markedly over their lifetime and it is unlikely that their economic life is beyond 15 years [10]. The constant reduction in output over those years and the shortened life will mean that the Carbon Calculator is seriously altered.

4.4 Issues related to access tracks, crane hard standings, turbine bases and other infrastructure

These infrastructure items have a significant effect upon the carbon balance both in the materials used and in their effect upon the release of carbon from peatlands. We have concerns that the following important issues may not be properly reflected in the 'Carbon Calculator':

[8] England's Peatlands –Carbon storage and greenhouse gasses, Natural England, 17th March 2010
[9] RES-010, Carbon calculator inquiry summary, John Ferry, November 2013
[10] The Performance of Windfarms in the United Kingdom and Denmark, Gordon Hughes, Professor of Economics , University of Edinburgh, Renewable Energy Foundation, 2012, page 7, paragraph 3

4.4.1 Although the dimensions of the tracks etc are fed into the spreadsheet there does not appear to be any output from it that takes into account the considerable amounts of carbon expended in the production of the aggregate for those items.

4.4.2 The area of peat that is excavated for the above infrastructure items will obviously be greater than the finished area of those items and will also have to accommodate drainage (including very wide swales) and possible banking in many instances. Thus the input into the model of the infrastructure dimensions only will be a serious understatement in many instances.

5. Conclusion

The cumulative effect of all the above factors in addition to those routinely considered by developers will considerably decrease the carbon savings balance for each windfarm. The extensive long distance transmission system and the considerable roadworks necessary for component and material delivery are inextricable within the process and the carbon impacts must also be taken account of in the balance. Little reliance can thus be placed on calculations based on an outdated and incomplete formula. The Alliance does not have the resources to undertake the detailed analysis required to work through these issues but would rely on them being taken into account in the decision making process.