

**National Assembly for Wales Sustainability Committee inquiry into carbon reduction in Wales: rural land use management and carbon reduction****Evidence submitted by Environment Agency Wales****SUMMARY OF KEY POINTS MADE**

- Work undertaken by AEA Energy & Environment, on behalf of WAG, indicates that greenhouse gas emissions in Wales in 2005 amounted to some **49.5 Mtonnes CO<sub>2</sub> equivalent (MtCO<sub>2</sub>e)** per year.
- Environment Agency Wales has calculated that some 39% of these emissions fall within devolved WAG competence – approximately **19.3 MtCO<sub>2</sub>e**.
- The “*One Wales*” commitment to achieve year on year reductions in greenhouse gas emissions of 3% from 2011 in areas of devolved competence implies that annual emissions in 2025 would then be **12.3 MtCO<sub>2</sub>e** – a saving of **7.0 MtCO<sub>2</sub>e**.
- The AEA report indicates that agriculture could realistically contribute annual savings of some **1.58 MtCO<sub>2</sub>e** by 2025. Land use, land use change and forestry might contribute annual savings of **1.49 – 3.49 MtCO<sub>2</sub>e** between 2008 – 2049.
- The key issue, however, is not simply how to manage land for carbon, but how to manage it best for a range of environmental goods (climate change, renewable energy, water management and biodiversity) as well as food production.
- Up until now, WAG policies on rural land use have concentrated on meeting objectives **other than** carbon reduction – which has therefore been an incidental **consequence** of policy, rather than a **driver**.
- The current European Commission proposals for changes to the operation of the EU Common Agricultural Policy (the “2008 CAP health check”) provide a key vehicle for achieving the changes that are now required. WAG is currently seeking to introduce these changes through its consultation document “**Sustaining the Land**”.
- Within “**Sustaining the Land**” we strongly support the suggested Option 3 for future land management actions, which would target resources explicitly and exclusively on WAG’s high-level objectives.
- If WAG is to adopt this more holistic approach to land management, it may need to negotiate more directly with the European Union over Wales’s share of the European Agricultural Fund for Rural Development.
- Targets for Wales should not, however, be developed in isolation from other parts of the UK and Europe. Rather, the approach should be to use land in different countries for the purposes to which it is intrinsically best suited.
- Developing an holistic approach might be made easier if a Welsh body was charged with taking the overview on carbon management in Wales, and had a statutory requirement to comment on carbon on greenhouse gas issues. WAG should consider identifying a competent authority to undertake this role.

## **INTRODUCTION**

The Agency submitted a general paper covering aspects of carbon reduction in Wales which was presented to the Committee on 4 October 2007. This covered the background to Climate Change, key Agency roles, indicators, emissions of greenhouse gases in Wales and some comments on policy issues. On 28 January 2008 we also presented a sector-specific paper to the Committee on the Environment Agency's role in reducing greenhouse gas emissions with respect to industry and our own carbon footprint.

In providing this current evidence, we first place emissions from land use management within the context of overall greenhouse gas emissions arising in Wales. We indicate our prime sources of data and highlight helpful documents. We then answer the specific questions that the Committee has raised, referring to the Agency's strategic interest in this subject area.

We are also submitting a seminar report entitled "***Sinks stores and soils – conserving land based carbon***"<sup>1</sup> produced jointly by the National Trust and the Environment Agency in January 2008.

## **SETTING THE CONTEXT**

### **(a) The Carbon Cycle**

Human activity disrupts the balance of the natural carbon cycle. At present just over half of the emissions arising from human activity are absorbed by the land or the oceans. The other half remains in the atmosphere as CO<sub>2</sub> and is giving rise to global warming. It is, then, very important to ensure that sinks of soil, vegetation and the sea remain in good order. If we can help natural processes absorb more then the consequences of emissions can be reduced.

### **(b) Source of data on greenhouse gas emissions and carbon sequestration**

Data presented in this paper have been quoted from the report prepared by AEA Energy and Environment in May 2008<sup>2</sup>. This report identified various policy options for reducing greenhouse gas emissions available to WAG, and discussed "acceptability" and "feasibility" issues associated with each. In our paper we are examining options for two sectors:

- Agriculture
- Land use, land use change and forestry

On a point of detail, the AEA report assesses the impact of farming across both these sectors. The impact of fertiliser application, enteric fermentation, machinery and manure is measured within "Agriculture". Emissions from, or sequestration by, cropland and grassland is measured within "Land use". As well as reporting historic emissions from 1990, this report projected forward to 2025, based on a continuation of existing or future committed policies.

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<sup>1</sup> Sinks, stores and soils – conserving land based carbon, seminar report published jointly by Environment Agency Wales and The National Trust, January 2008

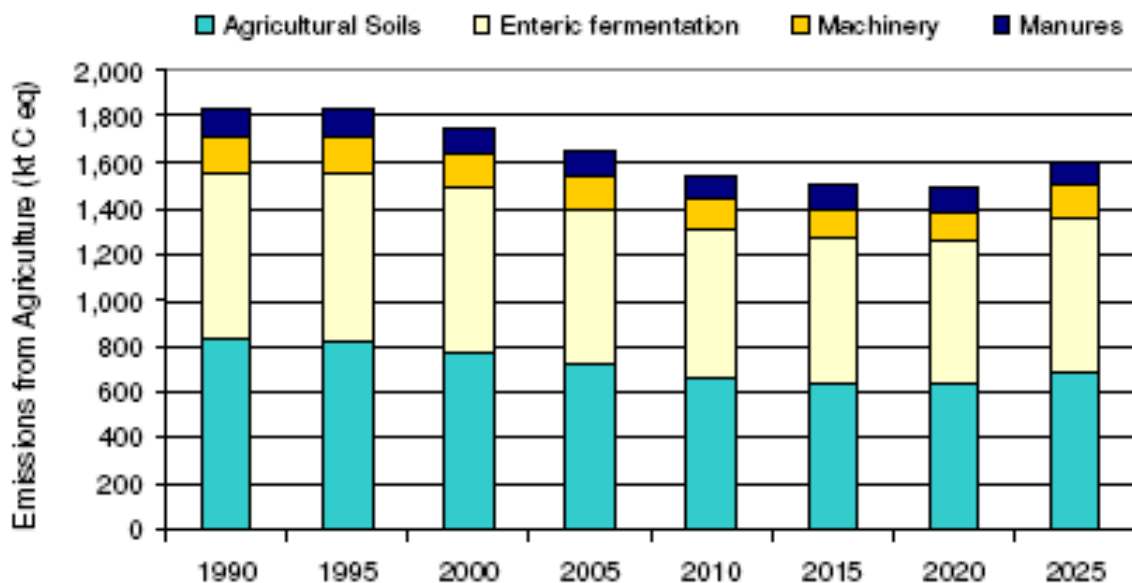
<sup>2</sup> Policy Options Development & Appraisal For Reducing GHG Emissions in Wales, report to the Welsh Assembly Government by AEA Energy & Environment, 23 May 2008.

### (c) Emissions from the Agriculture sector

Data available from National Atmospheric Emissions Inventory shows that the total greenhouse gas emissions for 2005 in Wales were approximately **49.5 Mtonnes CO<sub>2</sub> equivalent (MtCO<sub>2</sub>e)** (AEA report 2008).

Emissions of greenhouse gases from agriculture are reported in the same inventory. They include methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), as well as emissions of carbon dioxide (CO<sub>2</sub>) from farm machinery and direct combustion on farms. Both the methane and nitrous oxide emissions are expressed as carbon dioxide equivalents and are the major part of agricultural emissions. Emissions from on-farm electricity use and manufacture of fertilizers etc. are reported in the sectors in which they arise (Transport, Industry etc.).

Total agricultural emissions of greenhouse gases in 2005 were approximately **6.0 MtCO<sub>2</sub>e** – a decrease of 10% since 1990 and around 12% of the total greenhouse gas emissions in 2005. **Figure 1** shows the historic trend between 1990 and 2005 together with projected baseline emissions to 2025. Future projections assume little change in either livestock numbers or levels of fertilizer use. Please note that the AEA report quotes greenhouse gas emissions as **ktonnes carbon equivalent (kt C eq)**, so their figures need to be multiplied by a factor of **3.67** to convert them to the more commonly used kt CO<sub>2</sub>e.



**Figure 1: Greenhouse gas emissions from the Agriculture sector in Wales**

The reductions in emissions since 1990 have been driven predominantly by two factors:

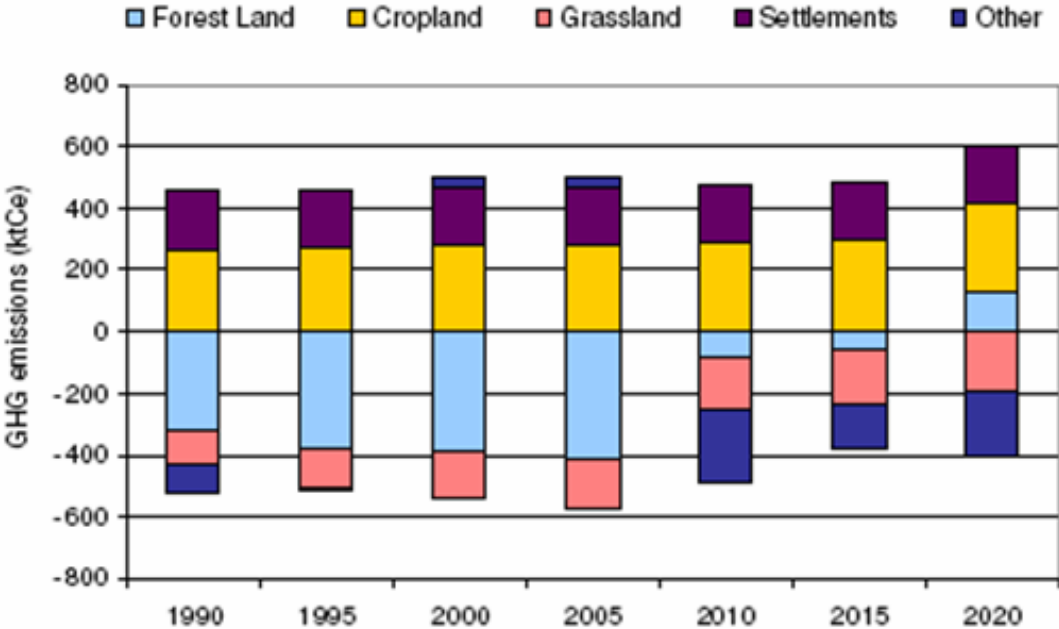
- Reductions in livestock numbers
- Decrease in fertilizer use

The decreases in fertilizer use have taken place partly in response to initiatives to reduce nitrate pollution in water but also due to increases in fertilizer costs.

**(d) Emissions from, and sequestration by, the Land use, Land-use change and Forestry sector**

This sector is capable of removing carbon from the atmosphere and locking it into ecosystems. Most attention is focused on Forestry although other areas are important including the way that agricultural land is used and the way that planning policies address urban spread and derelict land. Emissions are reported in the National Atmospheric Emissions Directory. Emissions from associated activities (e.g. transport) are considered under other headings.

A recent study by the centre of Ecology and Hydrology (quoted in the AEA report) has provided projections for Wales up to 2020. These are shown in **Figure 2**. The figure shows that this sector absorbs slightly more greenhouse gas than it emits at present (**0.29 MtCO<sub>2</sub>e**) but the projections are that with current policies there may be a net emission of **0.70 MtCO<sub>2</sub>e** by 2020. Most of this change is associated with Forestry, where the net emission or sequestration is said to be tied to the cycles of growing and felling.



**Figure 2: Net greenhouse gas emissions from Land Use, Land Use Change and Forestry in Wales**

**(e) Good practice guidance for the management of organic and organo-mineral soils**

The Welsh Assembly Government has recently issued a consultation document **“Sustaining the Land”**, which reviews land management actions under Axis 2 of the Rural Development Plan for Wales 2007-2013<sup>3</sup>. This examines how any proposed scheme should recognise that rural land provides a range of public goods, including carbon management. Appendix 2 of this document provides good practice guidance for the management of organic and organo-mineral soils with respect to carbon, under the following headings:

<sup>3</sup> Sustaining the Land: A review of land management actions under Axis 2 of the Rural Development Plan for Wales 2007-2013<sup>3</sup>

- Drainage
- Grazing
- Burning
- Fertilising
- Liming
- Tillage
- Grassland conversion
- Arable conversion

We suggest that this document would be particularly useful to the Committee as it undertakes its current inquiry.

## **RESPONSE TO THE SPECIFIC QUESTIONS RAISED**

**Question 1:** *Is the proposed 3% annual reduction target by 2011 “in areas of devolved competence” sufficient to enable Wales to make its full contribution to meeting UK-wide targets? If not, what targets should be put in place?*

Based on the AEA report, we have undertaken a review of the requirements needed to meet WAG’s proposed target. This paper was submitted to the Climate Change Commission in October 2008<sup>4</sup>. The issue of which sectors fall within or outside “devolved WAG competence” is not entirely black and white, but we judged that the following sectors should be included within WAG competence:

- Waste
- Agriculture
- Public Sector
- Transport
- Residential
- Land Use, Land Use Change & Forestry

Taken together we estimated that these sectors represented some 39% of greenhouse gas emissions in Wales – some **19.4 MtCO<sub>2</sub>e** annually. The “*One Wales*” commitment to achieve year on year reductions in greenhouse gas emissions of 3% from 2011 in areas of devolved competence implies that annual emissions in 2020 would then be **14.3 MtCO<sub>2</sub>e** – a saving of **5.1 MtCO<sub>2</sub>e**, and equivalent to a reduction of approximately **26%**.

For comparison, the Climate Change Bill, currently going through parliament, puts into statute the UK’s targets to reduce carbon dioxide emissions through domestic and international action by at least **60%** by 2050 and at least **26%** by 2020, against a 1990 baseline. Furthermore, in a Commons statement on 16 October, the new Energy and Climate Change Secretary Ed Milliband committed the UK to cutting greenhouse gas emissions by **80%** on 1990 levels by 2050. The Climate Change Bill would, he said, be amended accordingly as it goes through Parliament.

The AEA report states that Welsh emissions in 1990 were some **55 MtCO<sub>2</sub>e**, somewhat higher than the current figure of **49.5 MtCO<sub>2</sub>e**, but the sectoral composition was different then and direct comparison is therefore difficult. On the face of it, therefore, the WAG commitment is broadly in line with UK Government commitments.

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<sup>4</sup> *Setting a baseline for reductions in greenhouse gas emissions in areas of devolved Welsh Assembly Government competence and monitoring progress towards achieving targets*, paper by Environment Agency Wales to WAG Climate Change Commission 9 October 2008.

**Question 2:** *Should the emission reduction target be based on Welsh consumption, or production, or both (i.e. should it take into consideration the carbon dioxide generated in Wales (production) or the carbon dioxide emissions that Wales' residents are responsible for, regardless of their source (consumption)?*

At present, the UK Government measures CO<sub>2</sub> physically emitted within the UK's boundaries, as specified by the Kyoto Reporting Convention. The indicator can be described as "territorial emissions" or "**emissions from production**". Emissions from production include all CO<sub>2</sub> emissions from goods and services produced in the UK wherever they are consumed (either in the UK or exported). This measure does not take into account import-related emissions or those from shipping or aviation, which are both rapidly growing sectors.

In contrast, the "**emissions from consumption**" measure includes the emissions from goods and services consumed within the UK or by UK residents wherever those goods and services come from. It includes emissions from shipping and aviation in delivering those goods and services. A recent report to Defra "**Development of an embedded carbon emissions indicator**"<sup>5</sup> concluded that in 2004, total UK emissions from consumption were 37% higher than those from production.

We suggest that the WAG target should be based on **emissions from production**, since the methodology is more straightforward and internationally agreed. Furthermore, an up-to-date, definitive, data set already exists in the AEA report. If, however, a "fairer" approach is sought, a pragmatic approach might be to "uplift" the 3% annual reduction target by 37%, but then to implement this target through reductions in **production** emissions. In doing this, a case-by-case analysis would confirm that reductions were genuine – and not simply a result of transferring further production processes offshore. Alternatively, a small number of simple consumption measures could be introduced, as a parallel exercise. These might include domestic energy consumption and waste production.

**Question 3:** *What particular challenges do rural land managers in Wales face in reducing carbon dioxide emissions from their activities, and how can these challenges be overcome?*

Concentrating first on the impacts of climate change, the best predictions we have for the Welsh Climate to 2080 (UKCIP 2002) indicate some key risks:

- Hotter summers, milder winters
- Longer growing season
- More rain in winter, less in summer
- Sea level rise
- Increase in extreme years
- More droughts, heat waves, flooding
- Frequent and violent storms/ gales

It is important that land and soils are protected against these changes. Likely impacts include:

- Damage to cropping land on coasts, estuaries and floodplain
- Increased irrigation needs in drier periods
- Increased water logging and working on wet ground
- Increased soil erosion through flash flooding

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<sup>5</sup> [http://randd.defra.gov.uk/Document.aspx?Document=EV02033\\_7331\\_FRP.pdf](http://randd.defra.gov.uk/Document.aspx?Document=EV02033_7331_FRP.pdf)

- Increased soil erosion due to changes in crops planted (e.g. maize)
- Salinisation of groundwater due to decreased rainfall and increased temperature
- Subsidence
- Drying of peatlands

Given that extremes of temperature and rainfall will be more likely it is expected that erosion and drying will increase – reducing the soil’s capacity to store carbon. A warmer climate will further dry the peat surface and an increase in severe rainfall events is likely to cause an increase in peat erosion.

This clearly illustrates why it is very difficult (and potentially counter-productive) to separate the issue of **adapting** to climate change from its **mitigation** (reducing greenhouse gas emissions). Forestry, for example, may have mitigation potential but also adaptation potential for flood risk management, cooling and protection of existing soil structure. We need to adapt to maintain the existing carbon storage.

Even if it were possible to optimise the use of land for carbon reduction, that same land would also be needed for other purposes. The Environment Agency, for example, seeks to influence land use for the purpose of managing flood risk, water resources, water quality, fisheries and biodiversity. More broadly, society requires land for food production and recreation. The real challenge, then, is to find the best **overall** use of different land areas, so as to meet all these requirements in the most cost-effective way. Furthermore, striking this balance may itself change as climate change takes hold. For example, Wales may become relatively more attractive for food production as Southern European countries increasingly experience water shortages.

These issues are of topical relevance to bio-fuels, which are seen as competing with food production for prime land. For this reason “second-generation” biofuels should be encouraged, which primarily utilize waste from food crops. Biofuels should only be grown in areas where environmental impacts are minimal. Those requiring little fertilizer should be encouraged to restrict the possibility of increased nitrous oxide emissions. Processing facilities should also be developed in Wales, to capture more of the economic benefits locally.

**Question 4:** *To what extent has the Welsh Assembly Government been successful in utilising the powers available to it in order to reduce carbon dioxide emissions from rural land use?*

Up until now, WAG policies on rural land use have concentrated on meeting objectives **other than** carbon reduction – which has therefore been an incidental **consequence** of policy, rather than a **driver**. For example, “**Sustaining the Land**” presents an analysis of how current WAG agri-environment schemes (Tir Cynnal, Tir Gofal, Catchment Sensitive Farming, Organic, Tir Mynydd, Better Woodlands for Wales and Farm Woodland Premium Scheme) perform against 12 “resilience to climate change” factors, including “soil managed to retain carbon store”. None of these schemes was judged to address this latter objective effectively.

As far as the Agency’s activities are concerned, carbon protection also currently happens incidentally, rather than by design. For example, the restrictions on farmers in relation to nutrient application and run-off are primarily geared to protect water ecology. There are now direct controls available to the Agency within the Environment Permitting Regulations to control intensive pig and poultry installations, but again the key control here is for ammonia in relation to habitats issues; carbon or methane savings are incidental rather than overt.

We are conscious of this limitation in our policies to date, and are exploring how we can address carbon management more directly. For example, the Centre for Evidence-based

Conservation at Bangor University are currently undertaking a systematic review, on our behalf, of the question **“How do flooding and draining affect carbon stores and greenhouse gas fluxes in peat soils”**.

Work undertaken by Cranfield University<sup>6</sup> in discussion with the Agency provides a useful starting point in framing the issue of managing soils for carbon. Their report states *“The total amount of SOC [Soil Organic Carbon] in Wales is estimated to be 141 - 150 million tons (Mt) in the 0-15 cm soil depth for which most data exists. However, there is evidence of an overall background loss of carbon from all soils, which is greatest in those with the largest stocks of SOC. From the combined soil:land class categories it was calculated that on average Wales is losing carbon at the rate of 1.2 Mt/year. To put this in context, Wales emitted 42.5 Mt of CO<sub>2</sub> in 2006 from all man-made emissions”*. [This figure of **42.5 Mt** is lower than other figures quoted in our evidence because it excludes the non-CO<sub>2</sub> greenhouse gas emissions]

Furthermore the Cranfield report also discusses the ability of differently-managed types of land to sequester carbon. This is summarised in **Table 1** below:

**Table 1: Carbon input values by land use (Report by Cranfield University, after Adger et al. 1992)**

Land Use	Addition to soil (tonnes C/ha/yr)
Broadleaved woodland	2.5
Coniferous woodland	2.0
Upland coarse grass	1.3
Blanket bog	0.7
Arable crops	2.7
Permanent grass	3.9
Ley grass	1.4
Reclaimed land	0.4

This Cranfield report, set in the context of the AEA report, provides WAG with a starting point for assessing the place of carbon sequestration by modification of land use within any broader strategy for reducing green house gas emissions within Wales.

**Question 5: What opportunities does the Welsh Assembly Government have to help rural land managers:**

- (a) reduce their carbon dioxide emissions, and
- (b) better manage the storage of carbon within the land?

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<sup>6</sup> Soil carbon in Wales – current stocks, trends and opportunities for soil carbon capture, Alton, K. et al, Cranfield University, September 2007

The controls that are in place to offer some protection to soil carbon may be divided into three levels: **landscape**, **local** and **field**.

Protection of soil carbon at a **landscape scale** is possible through the work of National Parks, Areas of Natural Beauty, and major landowners. There are limited controls available and most are by negotiated management agreements.

At the **local scale** soil carbon may be protected through

- **Special Protection Areas** – designated under the Birds Directive to preserve or re-establish habitats (19 in Wales).
- **Special Areas of Conservation** – designated under the Habitats Directive for species and high habitat value (90 in Wales).
- **Ramsar Sites** – largely to protect important wetland sites but can offer protection for carbon rich soils such as those in bogs and fens (10 in Wales).
- **Sites of Special Scientific Interest** – largely underpin Natura 2000 and Ramsar sites. There are some 1000 sites in Wales comprising 11% of the total land area.

National legislation protects these habitats with CCW formulating agreements for their management. While these sites are not selected for soil or carbon protection the management requirements do give proxy protection. It may, however, be useful to consider adapting these designations to acknowledge the importance of carbon protection.

At a **field scale** regulatory protection is afforded by Environmental Impact Assessment, undertaken in relation to planning, agricultural and forestry controls. In addition cross compliance provides the main mechanism for regulating subsidy payments through the Single Farm Payment scheme. Good Agricultural and Environmental Condition controls carbon levels in relation to stubble burning, overgrazing, heather and grass burning.

Opportunities exist to provide incentives for carbon protection in the following schemes:

- **Tir Gofal** – areas are not currently selected for carbon reasons but improved carbon management arises through options such as safeguarding existing on-farm habitats and features, or reducing stocking rates.
- **Tir Cynnal** – resource management plans encourage land management that is beneficial to maintaining and improving soil carbon levels including grass leys, incorporation of organic manures and avoiding deep ploughing.
- **Organic Farming Scheme** – encourages more extensive systems including ley rotations and use of organic inputs.
- **Waste Strategies** – more compost will become available through the production and use of quality compost from source segregated biodegradable waste.
- **Industry led incentives** – assurance schemes and environmental branding may also encourage carbon management.

Interestingly, initiatives that seek to manage land in a more holistic way are already being developed independently of Government. Two deserve particular attention:

- United Utilities owns 57,000 hectares of land in North West England, which it holds to protect the quality of water entering its reservoirs. Through its **Sustainable Catchment Management Programme (SCaMP)**<sup>7</sup> it enters into tenant agreements covering issues such as reduced stock numbers and revised stock management. While SCaMP has not been designed with carbon reduction in mind it does provide ideas for a scheme that might do this.
- Within Wales, **Pontbren**<sup>8</sup>, situated in the headwaters of the river Severn is a farmers' cooperative concerned with sustainable upland agriculture, involving ten hill farms and over 1,000 hectares of agriculturally improved pasture and woodland. The families concerned are changing their farming practices to ensure a sustainable future for their children. They have asked the Centre for Ecology and Hydrology (CEH) and the University of Wales Bangor (UWB) to examine how their new farming methods are affecting the environment. Changes have already been found in soil structure and water movement in those areas where trees had been planted. Pontbren demonstrates the importance of a partnership approach which recognises the insights of those people practically involved in managing the land.

In summary, we recommend that

- Agri-environment schemes should protect existing carbon sinks and/or encourage carbon sequestration. They should also promote reductions in use of nitrogen fertilizer to reduce nitrous oxide emissions.
- Consideration should be given to including carbon retention and sequestration measures within designated habitat management plans.
- Consideration could also be given to identifying new areas for "special carbon protection". These are most likely to be in the areas of organo-mineral soils.

**Question 6:** *Could alternative targeting of Welsh Assembly Government financial resources lead to greater carbon dioxide emissions reductions within the context of rural land use than are currently being achieved? If so, where could additional resources lead to greatest impact? (Please provide detail to support your evidence)*

**Question 9:** *How can land managers in rural areas contribute to the Welsh Assembly Government's 3% reduction targets and how much reduction in CO<sub>2</sub> in Wales could realistically be achieved through improved land management?*

We are answering both these questions together, since the issues raised are linked. As noted above, the AEA report examined emissions from two sectors that are relevant here:

- Agriculture
- Land use, land use change and forestry

The report suggests that **Agriculture** could deliver some **3.36Mt CO<sub>2</sub>e/year** abatement potential by 2025. Whether or not this is achieved in practice will depend upon the financial incentives being in place. The report considers that the following measures are currently attractive in terms of abatement potential and affordability (**Table 2**). Anaerobic digestion is a doubly useful area for controlling emissions from agricultural waste in that it can supply energy through burning the methane produced. The Agency is actively seeking to minimize any regulatory burden associated with such developments and now requires only a

<sup>7</sup> <http://www.unitedutilities.com/scamp.htm>

<sup>8</sup> <http://www.ceh.ac.uk/sections/bef/Pontbren.html>

registration for exemption (as opposed to a full waste licence application) for small on-farm anaerobic digestion units.

**Table 2: Potential abatement measures within the Agriculture sector in Wales (data from AEA report)**

Abatement Measure	Abatement Potential in 2025 (ktCO <sub>2</sub> e / year)
Reduce livestock numbers	1180
Increase livestock productivity per head	240
Anaerobic digestion	160
<b>Total</b>	<b>1580</b>

For **Land use, land use change and forestry** the review identified policy options for carbon reduction and sequestration in the following areas:

- Expansion of forest area
- Forest management
- Agricultural land use
- Agricultural land management
- Management of organic soils
- Prevention of urban expansion.

Although further work may be required to set these policy options firmly in the Welsh context AEA suggest that, in combination, they could deliver around **7.3Mt CO<sub>2</sub>e/year** of carbon sequestration in Wales over the period 2008 – 2049. The following options were highlighted as being most effective and may be less controversial than those suggested in the agricultural sector (**Table 3**):

**Table 3: Potential abatement measures within the Land Use, Land Use Change and Forestry sectors in Wales (data from AEA report)**

Abatement Measure	Carbon Sequestration (kt CO <sub>2</sub> e / year in Wales between 2008-2049)
Improve grassland management	1460 – 2200
Reduce urban expansion	70 – 700
Increase forest rotation length	-40 – 590
<b>Total</b>	<b>1490 – 3490</b>

To place these figures in context, a 3% year-on-year reduction in all emissions within devolved WAG competence between now and 2025 would result in a reduction in annual emissions of some **7.0 Mt CO<sub>2</sub>e/yr** by 2025.

To provide further context, the AEA report also lists the top 20 options by abatement potential that are available to WAG across all sectors. The following options for Agriculture and Land use, land use change & forestry appear in this list (**Table 4**).

**Table 4: Options from the Agriculture and Land Use, Land Use Change & Forestry sectors that appear in the Top 20 by abatement potential in Wales (data from AEA report)**

Abatement Measure	Abatement Potential in 2025 (ktCO <sub>2</sub> e / year)
Biomass boilers *	1360
Reduce livestock numbers in response to CAP reform	1180
Improve grassland management	1090
Dietary change for livestock	480
Reduce grazing	430
Prevent urban expansion	350

\* Biomass boilers were identified in the **Business** sector, but are relevant to the issues discussed here

We recommend that a further review of these policy options be progressed to assess the practicalities of achieving the annual reductions indicated.

The role of Forestry in relation to carbon sequestration needs careful analysis. Our view is that:

- The aim should be to lock carbon away for the longest practical time by using timber for construction purposes. This would be burnt only when it reached the end of its useful life. However, brash that is not fit for construction purposes can be burnt at the time of felling.
- Trees should only be planted on appropriate soils. Some existing woodland developments are actually net carbon **emitters**, and therefore need to be removed.
- The rate at which trees accumulate carbon varies over their lives, and the profiles are different for different species. This needs to be factored into calculations of carbon sequestration.

Considering Agriculture and Land use, land use change and forestry together, WAG's current consultation on "**Sustaining the Land**" is particularly relevant. This proposes three options for Land Management Actions under Axis 2 of the Rural Development Plan for Wales 2007-2013. We strongly support **Option 3**, which would target resources explicitly and exclusively on WAG's high-level objectives. Under this option the scheme would have a hierarchy of three elements. At the highest level, a landscape/catchment scale element would be designed to deliver soil carbon conservation on all holdings with organic or organo-mineral soils in Wales.

**Question 7:** *What examples from other administrations (devolved, UK and overseas) where other means have been used to achieve reductions in carbon dioxide emissions from rural land use, could be adopted in Wales under current powers?*

As noted above, the Centre for Evidence-based Conservation at Bangor University are currently undertaking a systematic review, on our behalf, of the question "**How do flooding and draining affect carbon stores and greenhouse gas fluxes in peat soils**". The process they are adopting has been designed to attract comment and suggestions from

beyond Wales and we can make this information available to the committee, when it is produced.

**Question 8:** *In the context of the Government of Wales Act 2006, which further means of reducing carbon dioxide emissions from rural land use could only be achieved with the introduction of further legislative competence for the National Assembly for Wales?*

We believe there may be a case for WAG to negotiate more directly with the European Union over Wales's share of the European Agricultural Fund for Rural Development. The European Commission's proposals<sup>9</sup> for change to the operation of the EU Common Agriculture Policy (CAP), more commonly referred to as the "**2008 CAP Health Check**", emphasise the use of these funds to address Climate Change, Renewable Energies, Water Management and Biodiversity.

These are precisely the areas that WAG is suggesting for possible support under Axis 2 of the Rural Development Plan for Wales 2007-2013. Given its nature, it is quite likely that much of Wales's land is intrinsically better suited to these uses than to "single purpose" food production. There is a danger, however, that this message may be diluted within the UK's overall negotiating position, given that large areas of England may be more suited primarily to food production.

However land use objectives are decided, and the level of support determined, it is important to take a broader view here. Targets for Wales should not be developed in isolation from other parts of the UK and Europe. Rather, the approach should be to use land in different countries for the purposes to which it is intrinsically best suited. For example, reduction in livestock numbers has been proposed. However, parts of Wales might be best used for livestock. If numbers are to be reduced, by converting land to arable, then this might better be carried out in other parts of the UK. The important thing is to agree any "target sharing" with the administrations involved.

We believe that a further structural issue may be hampering progress towards an holistic approach to carbon management in Wales. There is currently no Welsh body charged with taking the overview on carbon management, or with a statutory requirement to comment on carbon or greenhouse gas issues. Consideration should therefore be given to identifying a competent body to assess the land use and carbon implications of proposed developments.

**Environment Agency Wales**  
**27 October 2008**

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<sup>9</sup> [www.ec.europa.eu/agriculture/healthcheck/guide\\_en.pdf](http://www.ec.europa.eu/agriculture/healthcheck/guide_en.pdf)