

BRIDGE *economics*



Environmental Economy of the North West: Final Report

August 2006

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for



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ENVIRONMENTAL ECONOMY OF THE NORTH WEST – SUMMARY REPORT

INTRODUCTION AND SCOPE

This study has been completed by Bridge Economics on behalf of the Environment Agency, the Northwest Regional Development Agency and Envirolink Northwest, to examine the Environmental Economy in the North West of England and to estimate the contribution that the sector makes to the regional economy in terms of jobs and regional GDP. The geographical area of the study is the Government Office region for the North West, ie. Cheshire, Cumbria, Greater Manchester, Lancashire and Merseyside.

Activities within the ‘environmental economy’ are defined as those which aim to protect or improve the environment, or which are dependent on a high quality environment. These criteria provide the basis for identifying which activities to include within the scope of the work. In addition to estimating the contribution made by these activities to the regional economy, additional objectives of the study are to:

- Identify the major environmental events in the region since the publication of the original report;
- Consider and report upon the developments in the sector since the original report; and
- Identify the key challenges for the sector, and make recommendations for the future development and growth of the environmental economy.

This draft report comprises a short descriptive summary of the quantitative findings, accompanied by a breakdown in table form. The report is presented under a number of headings: the size of the sector; the growth in the sector; major events that have affected the North West’s environmental economy over the past five years; and future challenges, opportunities and recommendations. In addition, there are three annexes: *Annex A* gives more details of the method used to estimate the economic contributions made by the disaggregated parts of the environmental sector, *Annex B* provides a list of sources used and *Annex C* gives Academic Consultees.

This document follows an earlier report, *Environmental Economy of the North West: A Driver for Economic and Social Progress* (ERM, 2000). While the scope of the initial study has been retained for consistency, methodological and structural shifts over the past five years mean that the many of the quantitative outputs are not directly comparable. Efforts have been made to standardise the approach and the inclusion of *Annex A* with its detailed methodology will allow for greater comparability should any future similar exercise take place.

SIZE OF THE ENVIRONMENTAL ECONOMY

As in the 2000 report, the relevant activities are split into three parts: the *Environment Sector*, the *Land Based Sector*, and *Environmental Tourism*. The *Environment Sector* includes companies operating within the Environmental Goods and Services (EGS) industry, as well as the waste management, recycling and

renewable energy sectors. It also includes the contributions from environmental management in industry, the work of the public sector through organisations such as Defra, the Environment Agency, English Nature, English Partnerships, the Countryside Agency, local authorities, NWDA etc and the wide range of environmental services provided by the not for profit sector (within which appear the region's Groundwork trusts, the National Trust, RSPB etc).

The *Land Based Sector* includes environmentally beneficial farming (defined as all farming in the region which is undertaken on holdings which manage their land in accordance with the requirements of Environmental Stewardship schemes), organic farming, countryside sports and forestry. The Land Based Sector also notionally includes sea angling and freshwater fishing, which activities are both dependent on a high quality environment – though in practice the contribution made by fishing is picked up under the heading of environmental tourism.

The final heading, *Environmental Tourism*, includes within its remit only tourism which is driven by a high quality environment. Estimating the proportion of total tourism coming from environmental activity is a difficult task but empirical evidence from large scale questionnaires has allowed us to effectively apportion two types of tourist activity (day trips and staying trips) by purpose. A category of 'Environmental Tourism' can then be assembled through considering a range of relevant activities – hill walking, rambling, visiting parks and gardens, nature studies, white water rafting etc – while excluding others such as shopping or visiting theme parks.

The approach to measuring the contribution of these three sectors to the regional economy is through the use of two principal indicators. The first is Gross Value Added (GVA), which measures the contribution (or 'value added' in monetary terms) to the regional economy of each individual producer, industry or sector. In the last report, a key indicator was GDP. GVA is now the preferred indicator used by the Office of National Statistics to measure income created (it is closely related to Gross Domestic Product: GVA plus taxes on products, less subsidies on products, equals GDP). The second indicator is employment. Where possible, this has been estimated in terms of full time equivalent jobs, though in some areas, such as tourism, no distinction between full and part time jobs is available yet. The findings for jobs and GVA contributed for each of the three main sectors considered are shown below.

The Environment Sector

The study found that the *Environment Sector* sustains an estimated 64,300 direct jobs, The GVA generated through these activities is estimated at some £1,690 million per annum. *Table 1* gives a more detailed breakdown of jobs and GVA under this heading.

Table 1: Estimate of GVA and Jobs within the Environment Sector

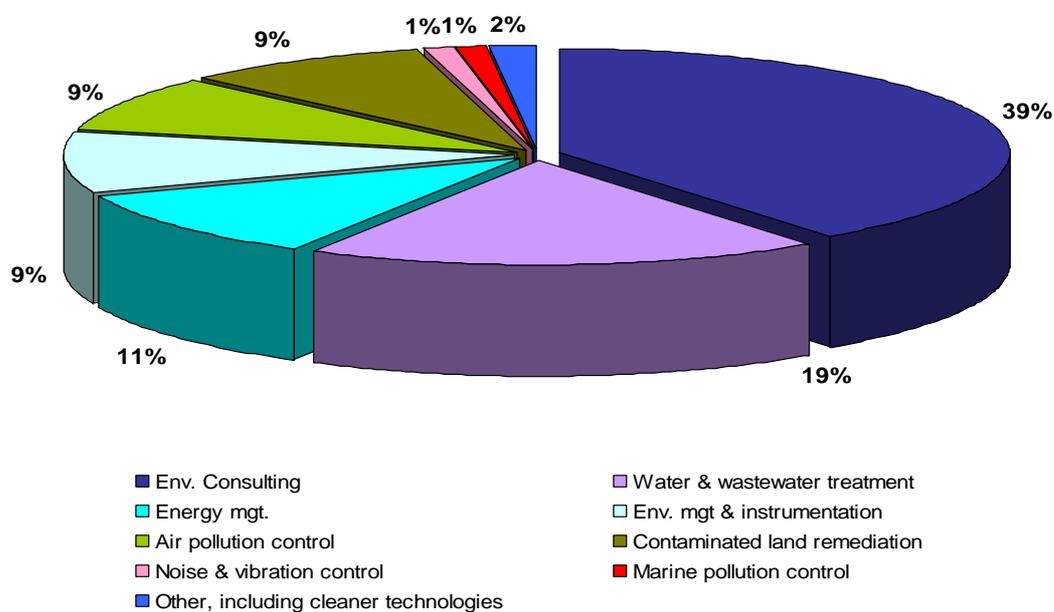
Jobs		Estimate of associated gross expenditure (£m)	GVA (£m)
Broad environmental goods and services sector	18,830	1,130	565
Waste management and recycling	23,500	1,527	700
Renewable energy	930	47	23
Environmental management in industry	1,400	70	35
Academia	675	n/a	n/a
Landscaping, ground keeping, local authorities, etc	16,500	585	270
Natural environment services not elsewhere classified			
Public sector	1,950	187	95
Not for profit, private sector, members' assoc.	526	58	n/a
<i>Sub-total</i>	<i>64,310</i>	<i>3,600</i>	<i>1,690</i>

Source: Bridge Economics

Note: Figures do not add exactly due to rounding. The 2000 report did not include landscaping and ground keeping; figures shown above for this line are from LANTRA (2003)

The largest subsector is waste management and recycling, employing some 23,500 people with an associated estimated GVA of £700m. The second largest sub-sector is the Environmental Goods and Services sector. This employs an estimated 18,830 people across a range of activities. The figure below shows these activities by size, based on the number of staff employed.

Figure 1: EGS Breakdown: Percent of Employment by Activity



Source: Envirolink Northwest and consultants estimates

While the chart reflects employment, an analysis based on the number of companies yields a similar breakdown.

The Land Based Sector

The part of the land based sector that contributes to a high quality environment was found to sustain an estimated 7,400 FTE jobs and generate GVA estimated at £215m per annum. This is around 30 percent of the total estimated GVA for the whole of the agricultural sector.

Table 2: Estimate of GVA and Jobs within the Land Based Sector

Sector	Jobs	Estimate of associated gross expenditure (£m)	GVA (£m)
Environmentally beneficial farming	5,400	390	150-220
Organic farming	300	n/a	n/a
Countryside sports	500	10-20	4-8
Forestry	1,250	70	25
<i>Sub-total</i>	<i>7,450</i>	<i>475</i>	<i>215</i>

Source: Bridge Economics

Environmental Tourism

Environmental Tourism sustains an estimated 26 percent of the North West's tourism sector. The Regional Tourism Satellite accounts (Cardiff Business School, 2005) estimate that some 134,000 jobs are entirely dependent on tourism implying that environmental tourism supports around 37,500 regional jobs. TSA sources estimate tourism GVA at £2.75 billion, suggesting a contribution to regional GVA from Environmental Tourism in the region of £770 million. More details regarding the techniques used to estimate the contribution from environmental tourism, as well as the environment and land based sectors, are shown in *Annex A*.

Overall Quantitative Findings

Aggregating the results from each of the three main sectors considered gives the following findings (*Table 3*) with respect to the size and nature of the environmental economy.

Table 3: Estimates of GVA and Jobs Contribution to the Regional Economy

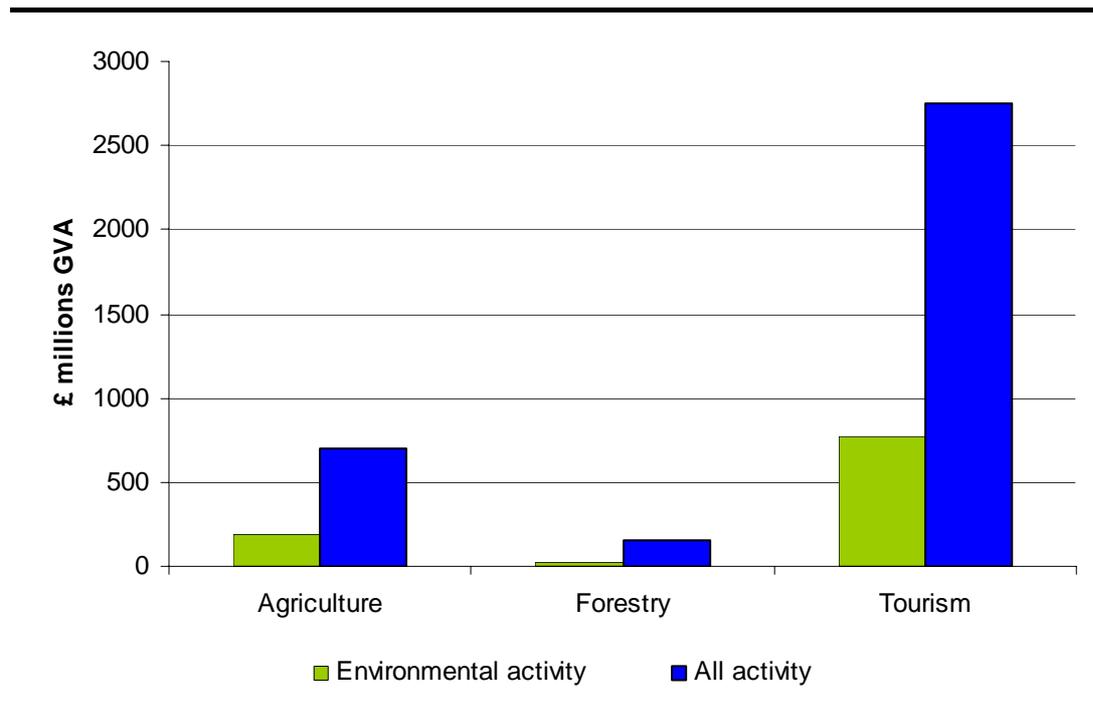
Sector	Jobs	Estimate of associated gross expenditure (£m)	GVA (£m)
The Environment Sector	64,310	3,600	1,690
The Land Based Sector	7,450	475	215
Environmental Tourism	37,500	2,070	770
Grand Total	109,300	6,150	2,675

Source: Bridge Economics
Note: Figures do not add exactly due to rounding

With total NW regional GVA estimated at £97.6 billion (ONS 2005, this estimate is for 2003 and is the most up to date available), and the current contribution of the NW environment sector estimated at over £2.6 billion, the sector is estimated to comprise some 2.7 percent of the value of the regional economy.

Clearly, these figures give us an interesting insight into the size and nature of the region's 'environment' sector. However, a wider interpretation may give larger numbers: where an 'environmental economy' activity shares the same Standard Industrial Classification/activity type, there will be other activities that fit into the same category but are outside the scope of the environmental economy. *Figure 2* gives examples of three of these, showing the relative size of the environmental economy activity compared to the wider sector for agriculture, forestry and tourism.

Figure 2: Selected Environmental Activity GVA as a Proportion of Sector Total (£m)



Source: Bridge Economics, ONS (2004), Entec UK (undated)

As well as operating within sectors, the environmental economy also extends across sectors. Though we can benefit from thinking about the 'environment' sector, especially in strategic or policy terms, in reality this sector is integrated through complex supply chains and economic activities with other sectors in the wider economy: construction, food and drink, engineering etc. For this reason, it is important to view the 'environment' sector as an integral part of the rest of the economy.

The analysis of the economic importance of the environmental sector has focused on employment and GVA. However, the environmental sector brings significant additional value to the region by:

- helping to enhance the environmental performance and competitiveness of other sectors – for example, environmental management activities in manufacturing industries provide opportunities for reducing costs, enhancing business competitiveness and compliance with environmental regulations;

- conserving and enhancing environmental assets which help to attract people and investment to the region – with environmental assets representing an important part of the region’s natural capital; and
- bringing physical and environmental improvements which lie at the heart of many economic and community regeneration programmes in urban and rural areas in the North West.

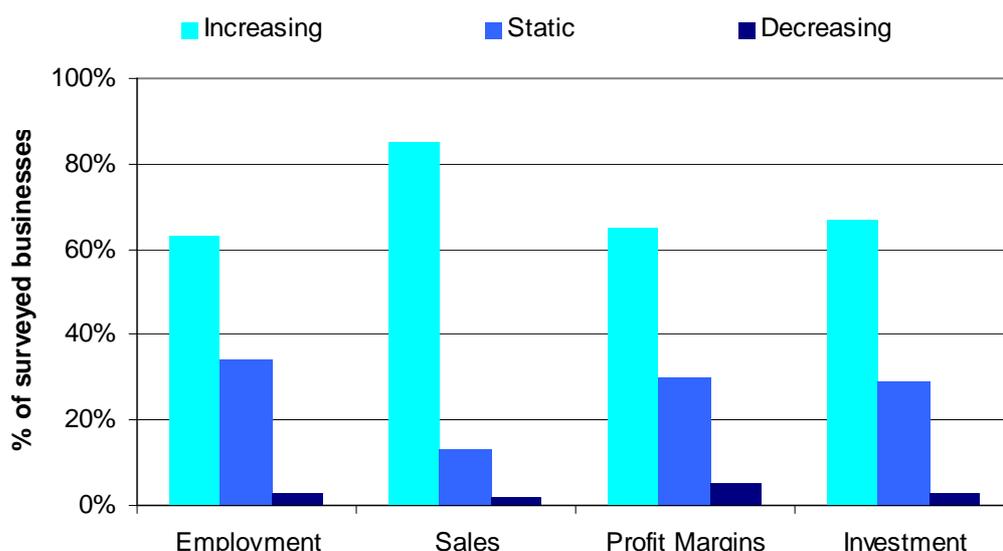
The importance of the environmental sector to the region’s economy also stems from the fact that many business activities and services within the sector can be classed as ‘indigenous’ and are strongly rooted to local areas – making them less susceptible to business decisions to relocate overseas. The environmental sector, therefore, provides long-term prospects for businesses and employment in the North West.

GROWTH IN THE ENVIRONMENTAL ECONOMY

Whilst not all the current data on the environmental economy is directly comparable with that contained in the 2000 report, analysis of certain data sets as well as qualitative indicators highlights growth in the region’s environmental economy.

Within the Environmental Industries in the North West there has been growth amongst businesses supplying environmental goods and services (EGS), recycling, waste management and renewable energy sectors. Recent Envirolink Northwest surveys of EGS businesses have included qualitative questions on trends over the previous three years in terms of employment, sales, profit margins and investment. As shown in *Figure 3* below, a large majority of businesses have reported growth in these areas. For example, 85 percent of surveyed EGS companies reported an increase in sales over the previous three years; and more than 60 percent of companies also reported increases in employment, profit margins and investment.

Figure 3: Reported EGS Trends – Employment, Sales, Profit Margins & Investment



Source: Envirolink Northwest

Significant recent growth has also occurred in the region's recycling sector, where turnover rose by 141% from £121 million in 1998 to £292 million in 2003 (Annual Business Inquiry 2003b). Regional turnover in the wider sewage and waste disposal sector increased by 41% from £877 million in 1998 to £1235 million in 2003 (Annual Business Inquiry 2003b).

The survey of the region's renewable energy sector undertaken by the Envirolink Northwest Renewable Energy Team (2005) has also highlighted rapid growth in the renewables sector. It showed that since the first study of the Northwest's renewable energy sector undertaken by Enviros in 2002 (Enviros, 2002), the size of the sector in the region has almost doubled. The number of employees has increased from 500 in 2002 to 930 in 2005, the number of companies has grown from 100 to 160, while total annual turnover has risen from £52 million to £96 million.

Away from the corporate sector, the present study included a survey carried out amongst a wide range of regional bodies including local authorities, quasi-governmental organisations and not-for profit groups. This survey was a repeat of a similar review carried out as part of the 2000 work. Around 20 organisations which provided responses to the 2000 survey provided comparable responses this time. The overall budget in these organisations was found to be strongly upward, with only one of the 20 reporting a (slight) fall. As a group, respondents' budgets had more than doubled – rising by some 130 percent during the five year period. Staff costs had risen in proportion, such that by 2005 aggregate staff costs were one and a half times that in 2000. In terms of goods and services, in both years, respondents reported that they sourced a high proportion of total supplies from within the North West region – around three quarters of all supplies come from within the region, contributing to a sense that the overall sector has grown strongly in the five years since the first study was carried out.

MAJOR EVENTS AFFECTING THE ENVIRONMENTAL ECONOMY IN THE LAST 5 YEARS

Events since the 2000 report have shaped the growth and development of the environmental economy. Six major influences have been identified:

- Regulations and public policy;
- Structures, funding and co-ordination;
- Links between environment and deprivation;
- Awareness and engagement;
- Environmental change; and
- Farming and countryside management.

These are addressed in turn below.

Regulations and Public Policy

New environmental legislation has continued to provide major opportunities for growth and development of the region's environmental economy.

The EU Landfill Directive is a prominent example and is driving major restructuring of the ways in which we deal with our waste. Requirements to reduce the proportion of

waste being disposed of to landfill and to shift up the waste management hierarchy is giving rise to new and more diverse waste management practices in recycling, reuse and reduction. This is generating significant business opportunities in the sector and driving innovation in waste management technologies and services.

Similarly, policy and legislation relating to energy and climate change (such as the Sustainable Energy Act 2003 and the Energy White Paper 2003), coupled with rising energy prices, is driving reductions in greenhouse gas emissions and increasing demand for energy efficiency measures and renewable energy – providing significant opportunities for the environmental industry.

Structures, Funding and Co-ordination

The 2000 Environmental Economy report proved a major boost for the sector. It helped to raise the political profile and access funding, and specifically led to the creation of key groups and organisations such as Envirolink. The structures to support the environment and capitalise on opportunities in the environmental economy are stronger now than in 2000. The Environment sub-group of the NWDA Board, the Natural Economy Steering Group, the Newlands Project and the creation of Enworks are all good examples of cross-sectoral mechanisms to support and coordinate development of the region's environmental economy. Also, through the NWDA, the establishment of the £11.1 million Tourism and Natural Economy Objective 2 Fund has helped to fund development of natural environment based leisure and tourism activities.

Links between Environment and Deprivation

Over the past five years, Government policy and public sector organisations have increasingly recognised the importance of links between the quality of the environment, deprivation and the attractiveness of neighbourhoods – as reflected in policy areas such as 'Liveability' and 'Cleaner Safer Greener'. A poor environment can be a symptom and cause of deprivation - linked to low business confidence in an area, crime, poor health, low community pride, low skills and aspirations. These links are reflected in the concept of 'environmental inequalities' – whereby residents in deprived areas suffer poorer local environments and are more likely to be exposed to a range of environmental 'bads'. Environmental improvement projects involving local people, such as Living Spaces, have made an important contribution to making our most deprived neighbourhoods more attractive to people and businesses, building stronger local communities and helping to address problems such as crime and poor health.

Awareness and Engagement

Public opinion and behaviour has changed since 2000. Farmers' markets and the demand for high quality local produce have grown in popularity and membership of voluntary organisations has increased. Greater public participation in recycling is helping us meet new and challenging targets.

These changes have been mirrored in the boardroom. The growth in Corporate Social Reporting and the increasing costs of poor environmental performance (in

areas such as waste and energy use) are driving increased business support for environmental improvement.

Environmental Change

The outbreak of foot and mouth disease caused a major shift in understanding regarding our countryside and greater attention is now given to diversification, environmental stewardship and the economic value of tourism. This trend is expected to gather pace in the years to come.

Our climate is changing too. We have seen extreme events across the world and in our own region, including the Cumbria floods in January 2005. Climate change is rapidly moving up the political agenda, and coupled with rising energy costs and concerns over energy supply, is driving opportunities in the environmental economy.

Farming and Countryside Management

2003 saw a major change in farming support when the strong link between agricultural production and subsidies was broken by the reform of the Common Agricultural Policy. This is establishing a stronger link between agricultural production and environmental management backed by the use public money to deliver lasting public benefits.

FUTURE OPPORTUNITIES, CHALLENGES AND RECOMMENDATIONS

Introduction

A number of opportunities and challenges are likely to face the environmental economy in years to come, summarised under the following headings:

- Climate Change and Energy Issues
- Farming and Rural Issues
- Regulation and Statutory Changes
- Funding and Procurement Practices

Regional partners and decision makers in the public, private and voluntary sectors will need to work together to ensure that the region addresses these challenges and capitalises upon opportunities for the development of the environmental economy.

Climate Change and Energy

Climate change is becoming an increasingly important political priority. Over the next five years, policies linked to the Energy White Paper and outcomes of the national energy review, as well as long-term concerns over the security of energy supply and fuel poverty, will further drive actions to reduce greenhouse gas emissions, enhance energy efficiency and promote renewable energy, sustainable construction and sustainable transport.

The growth in renewable energy, including wind power, offers real opportunities for the region, linked to the North West's strong energy and renewables sector and considerable engineering expertise. Market opportunities will exist at home and overseas. Similar opportunities exist for low carbon and energy efficient

technologies and processes in buildings, industry and transport. Sector champions will need to ensure maximum advantage can be taken of these opportunities.

The nuclear debate concerning both decommissioning and generation is highly topical and forms part of the recently announced national energy review. There is a potential challenge should medium to long term government policy support an increase in nuclear energy generation, since this is likely to reduce the rate of growth within the renewables sector. On the other hand there would be more positive impacts elsewhere in the Northwest due to the region's historic strength in nuclear power generation and waste handling.

Farming and Rural Issues

The farming and land based sectors are undergoing significant change, as payment schemes have changed to link them more closely to environmental management and stewardship; and as consumer demand is increasing for organic and local produce, as well as environment based recreation and tourism. National strategies such as the Rural Strategy 2004 and the Strategy for Sustainable Farming and Food highlight opportunities associated with the environment for diversification and prosperity of land based businesses and rural economies.

It will be necessary to support rural businesses develop economic activities which link to the high quality environment and which support protection / enhancement of these environmental assets. With the new roles given to Regional Development Agencies for rural business support, it will be important for regional decision makers, Natural England and partners such as the NWDA to work together to support development of these activities in areas such as:

- local produce (food, drink) linked to sustainable land management;
- sustainable woodland management;
- non-food crops for uses such as biofuels / renewable energy sources; and
- environment based tourism and recreation linked to sustainable land management practices.

Supporting and nurturing the rural environmental economy will also be important in providing incentives to encourage young people to go into farming and landscape management, in the face of rising average ages of farmers and decreasing employment in the sector.

Funding and Procurement Practices

A number of important funding programmes for environment related activities are changing or drawing to an end – for example, reduction of European Regional Development Funding (ERDF); the end of the Single Regeneration Budget (SRB); and question marks over the future of EU LIFE funding and Heritage Lottery Funding (the London Olympics may reduce HLF / Big Lottery allocations to the North West). Even Environmental Stewardship schemes cannot be guaranteed for the long-term.

Although some new funding opportunities are developing (eg. linked to the Government's carbon reduction and waste management policies), these changes in funding programmes could have serious implications for initiatives such as Envirolink, Enworks and the Mersey Basin Campaign, as well as for many voluntary organisations in the environmental sector.

It will therefore be important for partners to work together to identify the critical activities to support and develop creative ways of supporting these activities through the medium and longer term. This is essential for making best use of available resources, and will mean that partners will need to focus on generating value for money in terms of economic and environmental outputs, as well as linking environmental improvement actions to other agendas such as housing, health, education, business competitiveness and community regeneration (where other funding could be accessed).

As highlighted by the Sustainable Procurement National Action Plan, opportunities for supporting development of the environmental economy through public sector procurement practices will also need to be grasped. This will help to increase demand for environmental goods and services, as well as local products (food, drink) and involvement of local people in environmental regeneration schemes.

Environment and Regeneration

Increasing attention on the link between the quality of the environment and social and economic deprivation ('environmental inequalities') is driving opportunities for environmental regeneration in the most deprived communities, especially urban areas of the North West. It will be important for partners to build on good progress made by programmes such as Newlands, the Mersey Basin Campaign and Groundwork initiatives in regenerating deprived communities and generating health, housing, educational and crime reduction benefits through environmental improvement actions.

Effective integration of environmental priorities and improvement projects into Local Area Agreements is also a high priority across the North West, and will require close working between environmental bodies, local authority partners and voluntary sector organisations.

Just as new housing and business developments need infrastructure such as transport, communications and utilities, so too do they need 'green infrastructure' such as green spaces and environmental assets to enhance quality of life and attract investment. Examples in the region such as Bold Moss in St Helens highlight the economic and social benefits of greening in housing schemes. It will be important that this 'green infrastructure' is developed across the region, including in housing renewal areas and plans for 'regional parks' (such as the Mersey Waterfront Regional Park and the East Lancashire Regional Park).

Regulation and Statutory Changes

The Environment Agency is dealing with over 40 new pieces of environmental regulation due to be implemented over the next few years. The Water Framework

Directive, the REACH Directive and the Marine Bill are three notable examples that present opportunities for the growth of the environmental economy of the region.

As well as presenting opportunities for the environmental sector, new legislation can compromise business competitiveness if businesses are not ready to react to change. There is therefore a need for the environment sector to help the businesses in the region get ready to meet the new compliance challenges. Effective delivery in the region of Government support programmes, such as BREW, WRAP, Carbon Trust initiatives and modernisation of environmental permitting (eg. NetRegs) is essential. It will also be essential that environmental support to businesses is effectively integrated with 'mainstream' / generic business support (eg. delivered by Business Link).

Natural England comes into effect in October 2006 and will bring together the current roles of English Nature, the Landscape, Access and Recreation division of the Countryside Agency and the environment activities of the Rural Development Service. Its remit includes contributing to social and economic well-being through management of the natural environment, and its activities will therefore be key in developing environmental economy activities (especially in rural areas).

CONCLUSIONS

The Northwest environmental economy has developed significantly since 2000, both in terms of its size and also in its profile. The region's environmental economy generated an estimated 109,300 jobs in 2005, associated with an estimated gross value added of £2,675 million (£2.65 billion), equivalent to 2.7 percent of the regional economy. The significant contribution made to the region's economy has helped to raise the profile of the sector since the first study of the region's environmental economy was published in 2000. However the main growth in the profile of the sector has been driven by greater recognition of the potential impacts of environmental change; government policy and regulations in areas such as waste, climate change and rural development; and greater understanding of the importance of the linkages between environment and regional economic development and regeneration.

The foot and mouth disease outbreak, together with the increased frequency of flooding events and rapid emergence of climate change onto the agenda, have helped to continue a shift in public opinion that while apparent in 2000, has grown significantly since then as a political and economic driver of the environmental economy. This shift continues to influence the growth of corporate social reporting and also helps shapes the supply side for goods and services such as organic and local produce and low carbon and energy efficient technologies. Changes in the regulatory and strategic environment have also helped drive environmental improvements as well as providing opportunities for regional business, community regeneration and for rural diversification.

The environmental economy now faces a range of disparate but linked challenges and opportunities, including in relation to climate change and energy, the rural economy, linking the environment with economic benefit and driving and coping with changes in the regulatory regime. Coupled with these issues is the overarching question of funding to support sector growth. The Northwest is well placed to benefit

from future opportunities, but for the region's environmental economy to maximise its advantage, regional decision makers and sector champions will need to continue to work together to demonstrate how environmental protection and improvement activities contribute directly to realising economic and social priorities, and ensure that future challenges can be effectively met.

Annex A

Methodology and Supporting Documentation

INTRODUCTION

This *Annex* provides additional detail into the approaches employed in estimating the economic contribution of environmental activities to the regional economy. The sub-sectors are addressed in turn – first the Environmental Sector, then the Land Based Sector, and finally Environmental Tourism. In each case, the scope of the sectors are defined and their constituent parts are disaggregated and quantified accordingly.

ENVIRONMENTAL SECTOR

Environmental Goods and Services

The Environmental Goods and Services sector is defined as: ‘*goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems*’ (OECD 1999). In line with UK Government definitions of the sector developed by the DTI, the sector in the North West comprises the following sub-sectors:

- Air pollution control;
- Contaminated land remediation;
- Cleaner technologies and processes;
- Energy management;
- Environmental consulting;
- Environmental monitoring and instrumentation;
- Landscape services;
- Marine pollution control;
- Noise and vibration control;
- Renewable energy;
- Waste management and recycling;
- Water and wastewater treatment.

The *Environmental Economy of the North West: A Driver for Economic and Social Progress* (ERM, 2000) estimated that there were 570 suppliers of environmental goods and services in the region (excluding waste management operators, United Utilities and renewable energy companies - these areas are covered in separate sections below). These 570 companies employed approximately 15,000 personnel. This information was based on Envirolink Northwest’s company database and a business survey undertaken in 2000.

In 2005, the Envirolink Northwest database contains 1,031 EGS companies and provides information based on business surveys conducted since 2002. Excluding waste management operators, United Utilities and renewable energy companies (in line with the 2000 analysis), leaves 623 companies across sub-sectors as shown in *Table 1*. These companies employ an estimated 18,831 employees – based on employment data contained in the Envirolink NW database for 460 companies and jobs per company averages used in the 2000 Envirolink survey.

Table 1: Number of Companies and Employment in the North West EGS Sector

Environmental Goods and Services Sub-Sector:	No. of Suppliers	Jobs
Environmental Consulting Services	247	7,611
Water and Wastewater Treatment	116	3,691
Energy Management	68	1,496
Environmental Monitoring and Instrumentation	58	1,843
Air Pollution Control	55	1,747
Contaminated Land Remediation	54	1,707
Noise and Vibration Control	8	258
Marine Pollution Control	7	218
Other – including Cleaner Technologies	10	260
Total	623	18,831

Source: Envirolink Northwest (2005a) EGS company database, 2005.

Note: Job estimates are based on a combination of employment data contained in the Envirolink NW database and jobs per company averages used in the 2000 Envirolink survey.

Waste management, recycling and renewable energy jobs are not included in this Table and are covered below.

The figure of 1,496 jobs in energy management based on the Envirolink database compares with an estimate of 3,500 energy management/efficiency jobs contains in the report *Energy in England's the North West* (Enviros, 2003)

It is estimated that these 18,831 EGS jobs generate £565 million in Gross Value Added (GVA). This GVA figure is calculated on the basis of £60,000 turnover per job in EGS businesses (based on typical turnover/employment ratios in EGS companies in the UK) and a GVA /turnover ratio of 0.50 (consistent with ONS statistics for different industry sector – Annual Business Inquiry 2003b).

The Envirolink NW database indicates that the EGS sector in the North West has grown since 2000 – the 623 companies in 2005 comparing with 569 in 2000. In addition, growth in the sector is also reflected in companies' responses to survey questions on employment, turnover, profit margins and investment trends over the last three years. As shown in *Table 2*, the majority of companies that responded to these survey questions reported growth.

Table 2: North West EGS Company Growth Trends – in Employment, Sales, Profit Margins and Investment

Trend over previous 3 years:	Employment	Sales	Profit Margins	Investment
Increasing	63%	85%	65%	67%
Static	34%	13%	30%	29%
Decreasing	3%	2%	5%	3%
	100%	100%	100%	100%

Explanatory note – eg. 63% of surveyed companies reported an increase in employment over the previous 3 years.

Source: Envirolink Northwest EGS company database, 2005.

Waste Management and Recycling

The Office of National Statistics provides regional data on turnover and GVA for the *recycling* sector (ONS SIC code 37) and *sewage and refuse disposal and similar activities* (ONS SIC code 90). These two SIC codes have been used in order to map the size of the EGS sector at the UK level (see DTI, 2005).

Based on the latest available ONS data for 2003, the turnover in recycling and refuse disposal in the North West was £1,527 million in 2003, associated with an estimated regional GVA of £697 million. *Table 3* shows how these figures have grown in recent years in line with significant UK growth in the waste management and recycling sectors. For example, turnover in the region's recycling sector rose by 141% to £292 million between 1998 and 2003. The larger sewage and refuse disposal sector grew by an estimated 41% over the same period.

Table 3: Size of the North West Recycling and Waste Disposal Sectors

	Year	North West			UK				
		Turnover (£m)	% Growth 1998 - 2003	GVA (£m)	% Growth 1998 - 2003	Turnover (£m)	% Growth 1998 - 2003	GVA (£m)	% Growth 1998 - 2003
SIC 37 recycling	1998	121		41		874		296	
	2000	194		67		1301		429	
	2003	292	141%	86	110%	2257	158%	641	117%
SIC 90 Sewage and refuse disposal	1998	877		582		6397		4413	
	2000	1116		587		7846		4716	
	2003	1235	41%	611	5%	8831	38%	5393	22%
TOTAL	1998	998		623		7271		4709	
	2000	1310		654		9147		5145	
	2003	1527	53%	697	12%	11088	52%	6034	28%

Source: Annual Business Inquiry (2003b), ONS Release date 15/9/05.

Employment in the recycling and waste management sectors is estimated at 23,492 employees. This is calculated on the basis of £65,000 turnover per job in these sectors (consistent with ONS statistics on GVA per employee provided to us as an update to the figures provided in Daffin, C and Lau E, Office of National Statistics 2002).

Renewable Energy

The renewable energy sector forms part of the wider energy industry of the North West which contributes around 53,000 jobs and over £5 billion in turnover to the regional economy (Enviros, 2003).

Data on the size of the renewable energy sector in the North West has been provided by the Envirolink Northwest Renewable Energy Team – based on a recent survey of renewables businesses (Envirolink Northwest Renewable Energy Team, 2005). The survey identified 160 companies in the region, employing 930 employees; and estimated that the renewable energy sector in the North West generated turnover of £96 million in 2004 / 05. The survey also reveals rapid recent growth in the sector. Since the first study of the Northwest's renewable energy sector undertaken by Enviros in 2002 (Enviros, 2002): employee numbers have increased from 500 in 2002 to 930 in 2005, the number of companies has grown from 100 to 160, while annual turnover has increased from £52 million to £96 million.

Environmental Management in Industry

This element of the environmental industry relates to internal environment management posts in companies, mainly the larger manufacturing companies with potential environmental issues to address. The Institute of Environmental Management and Assessment (IEMA) estimates that there are approximately 10,000 environmental management posts in the UK (IEMA, 2005). Extrapolating on the basis of regional manufacturing GDP (14 percent of UK manufacturing GDP), this gives 1400 posts for the North West.

Academia

The academic sector was surveyed and researched as part of a separate exercise carried out by Envirolink Northwest which ran in parallel with the Environmental Economy work in July and August of 2005. To avoid generalist and non-specific staff and courses, the scope included only that of post-graduate teaching and research activity which was identified as being directly relating to the environment sector. Relevant faculties and departments were identified through a desk based study and contacted first in writing and then through a number of telephone calls.

Following the survey and follow up calls, we are grateful for the contributions of many North West institutions, departments and faculties, whose activities are included within the scope of the study. These institutions are listed in *Annex C*.

Our own survey showed that these organisations employed 541 FTE staff active in environmental teaching or research. Added to this are some 134 FTE staff engaged largely in EGS and energy related activities, giving a total of some 675 academic staff active in the region whose activities fit within the scope of this work.

Landscaping, Local Authorities, Ground Keeping etc

The scope of activities under this heading includes landscape management, landscape design and construction, management and maintenance of sports turf as well as private, heritage and botanic gardens, commercial grounds, the operation and maintenance of public parks and green space.

An estimated 16,500 jobs are sustained within these areas of activity. These employment figures are based on personal communication with Lantra, the Sector Skills Council for the Land Based Industries, which provided us with a national (2005) estimate broken down by type of activity. Lantra's national estimate is based on data from the Institute of Groundsmanship, the Greenkeepers' Training Committee, the number of landscaping businesses (from the Yellow Pages database), a conservative estimate of Local Authority employment and evidence collected by Lantra on the management of greenspace and of botanical and historical gardens.

The conversion of the national figure to regional activity was carried out through using a regional adjustment factor published in Lantra (2003). Overall GVA per job was estimated using Daffin & Lau (2003) plus updates and was based on a mean average for the following sectors:

- botanical and zoological gardens and nature reserve activities;
- recreational activities not elsewhere classified;
- other service activities not elsewhere classified.

This produces an average GVA per job of £16,300 and total GVA of some £270m. The estimation of associated gross output was obtained using Office of National Statistics Input-Output Annual Supply and Use Tables (ONS, 2002).

Natural Environment Services Not Elsewhere Classified

Figures presented here summarise the results of the Natural Environment Survey, a questionnaire circulated to a range of organisations the activities of which are focused on improving the quality of the region's environment. The questionnaire asked respondents to estimate the jobs and expenditure associated with the activities that they undertake which take place within the region and which directly relate to the protection, conservation and enhancement, interpretation of promotion of the environment.

Among the organisations that provided positive responses were:

- British Trust for Conservation and Volunteers;
- British Waterways;
- Countryside Agency;
- English Nature;
- English Partnerships;
- The Environment Agency;
- Forestry Commission;
- Government Office of the North West;
- The region's Groundwork Trusts;
- The Lake District National Park;
- Mersey Basin Campaign;
- Morecambe Bay Partnership;
- National Trust;
- NWDA and NWRA;
- RSPB;
- The Ramblers Association;
- The Rural Development Service of Defra;
- Sustainability Northwest;
- The region's Wildlife Trusts; and
- The Woodland Trust.

The questionnaire was distributed to 143 organisations, with respondents being followed up via telephone in the case of no response being received. At the deadline for responses, 65 organisations had sent a response (45 percent), of which 55 (38 percent) were useable. Because it was more appropriate to include certain responses under headings elsewhere in the study (for example, the Forestry Commission's employment and expenditure is dealt with as part of the forestry assessment, while the spend of the Rural Development Service is addressed as part

of the Land Based sector) the responses which would have resulted in double counting were stripped out of the results.

The outcome was that expenditure of some £246m (adjusted to exclude double counting) was identified in the most recent year available (the most recent year differed depending on the respondent) coupled with employment of 2,476 full time equivalent jobs. These figures are dominated by the Environment Agency which was the largest organisation surveyed, and which reported an annual spend of £74m and employment of some 1,200 people.

These figures are an underestimate of the true regional spend as they account for only 45 percent of those organisations surveyed. This response rate is comparable with the survey carried out in 2000 by the RSPB which collected 87 responses, or 43 percent of those surveyed.

Comparison with the 2000 Survey

Around 25 organisations which provided responses to the 2000 survey also responded to the 2005 update. Some of these organisations provided responses over the two surveys which were clearly incompatible (generally because those individuals who responded included different parts of the organisation on the two different questionnaires). However, isolating those with comparable results over the five year period gives us a group of about 20 organisations, whose responses have been analysed, with aggregate conclusions presented here.

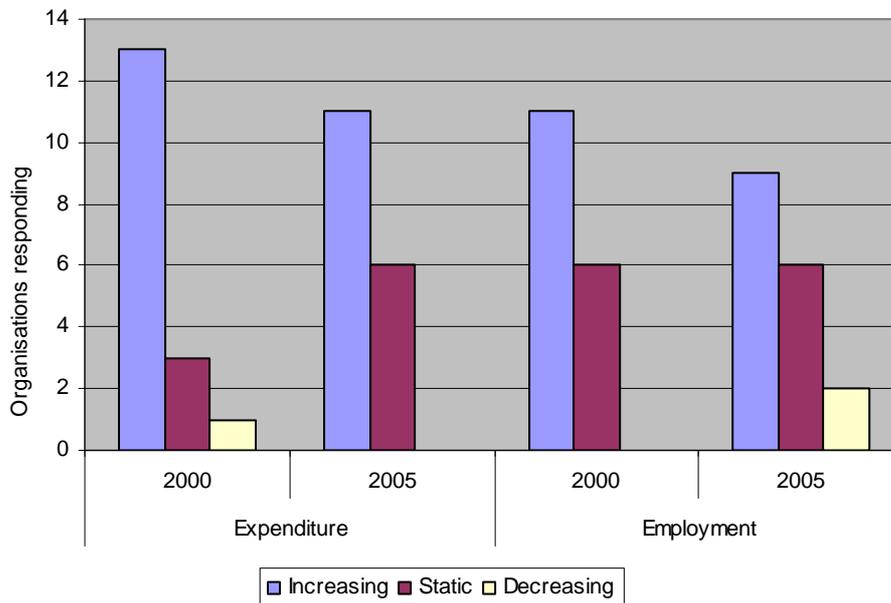
The overall budget in these organisations was strongly upward, with only one of the 20 reporting a (slight) fall. As a group, respondents' budgets had more than doubled – rising by some 130 percent. Staff costs had risen in proportion, such that by 2005 aggregate staff costs were one and a half times that in 2000. In terms of goods and services, in both years, respondents reported that they sourced a high proportion of total supplies from within the North West region – around three quarters of all supplies come from within the region.

Many respondents report that they operate sites that are open to visitors. Considering those sites operated by organisations that responded to the question in both surveys allows us to have a like for like understanding of changes in the numbers of sites being operated. In fact, the figure has grown significantly – from 184 to 228, up by nearly a quarter. And in a like for like analysis (ie, looking only at those organisations who gave us an answer both times) staff numbers were up too – from 217 to 299 – a rise of nearly 40 percent.

Finally, we consider changes in perceptions over the five years. Figure 1 gives a summary. The blue columns show the number of respondents who believe expenditure and/or employment is set to increase, the red show the number who believe there will be no change, and the white columns show those who think expenditure and/or employment is expected to drop. The figure shows that respondents in both surveys were slightly more optimistic about expenditure increasing than they were about employment rising. The figure also shows that respondents generally appear to be a little less optimistic about future development in the sector in 2005 than they were in 2000. While this is interesting, it cannot necessarily be relied upon: we can now say with hindsight that in 2000, those who

thought expenditure and employment would fall or remain static seem to have been unnecessarily pessimistic.

Figure 1 Changing Perceptions of Future Growth, 2000-2005



Source: Comparison of 2000/2005 Natural Environment Surveys

LAND BASED SECTOR

Environmentally Beneficial Farming

Agriculture is generally dependent on the quality of the environment but not all agricultural activity is beneficial to the environment. The study therefore aimed to quantify only those agricultural activities that make a positive contribution to the quality of the environment. As a proxy for this, we have included (as in the 2000 study) only organic farming, and those agricultural activities which benefit from agri-environment schemes. These schemes make payments for the adoption of agricultural practices to conserve wildlife habitats, historic, archaeological and landscape features and improve opportunities for the enjoyment of the countryside.

There is good evidence about the broad structure and performance of the agricultural sector in the North West but much less focusing on the agri-environmental and organic farming sectors in the region. These two areas of activities and our approach to measuring them are addressed in the paragraphs below.

Agri Environment Activity

The longest running of the schemes, the Environmentally Sensitive Areas (ESA) scheme was introduced in England in 1987 and covers 22 areas designated for their unique environmental features. The Countryside Stewardship Scheme (CSS) applies outside ESAs and aims to encourage farmers to conserve and enhance particular landscapes, features and habitats. Up until 2005, these two schemes,

together with a third, the Organic Conversion scheme, were by some margin the largest of the agri-environment schemes in operation. Following changes to the structure and operation of European funding for agricultural production, in 2005 these schemes were merged into the new Environmental Stewardship scheme, under which farmers could apply for entry level stewardship, higher level stewardship or organic entry level stewardship. In each case, a recipient must demonstrate that he or she is taking steps towards beneficial land management in order to qualify for funding. These steps are documented in detail under the scheme and include options such as laying and maintaining hedgerows and dry stone walls, leaving buffer strips in and around fields, managing drainage and ditches, encouraging the natural development of habitats etc.

Much statistical data is available from the Defra Agricultural Census which is regularly updated with figures on the amount of land being used for livestock and crop farming and on employment, and this has been used to help inform analysis. However Environmental Stewardship is a relatively new scheme for which there is no available performance and evaluation data. Our analysis therefore draws on available data for ESA and CSS schemes.

In 2004, over a million hectares of land in England – about 10 percent of the total agricultural area – was included in either the ESA or CSS. As would be expected, significant work has been carried out with the objective of evaluating the operation of these schemes. However a review of this work demonstrates that findings have tended to be qualitative rather than quantitative, and this is especially the case where the focus is on the economic impact of the schemes. A notable exception is Agra CEAS Consulting (2005), the findings of which we have been able to draw on and validate through our analysis.

Estimating the Employment Associated with Agri-Environment Activity

The most detailed quantitative economic study of the impact of agri-environment activity yet published is the *Socio-Economic Evaluation of Tir Gofal*, by Agra CEAS Consulting for the Countryside Council for Wales and Welsh Assembly Government (2005). Tir Gofal is the Welsh equivalent to the English ESA and CSS. Since quantitative reports relating to North West (or even English) agriculture are not available the findings from this report are used as a proxy for the North West and validated through a second less rigorous approach.

Agra CEAS sampled a statistically significant 251 farms, approximately 20 percent of all participants in the scheme. The survey found 92 percent of respondents reported that Tir Gofal had resulted in greater labour requirements. Across the whole sample, including those who did not report an increase in workload, the average increase amounted to 66 extra person days per year. In addition to providing this overall average figure, the survey also showed the distribution of the extra work, which is shown in Table 4. A key finding is that much of the additional work is taken on by the farmer or the farming family.

Our approach in estimating the additional employment impact of agri-environment schemes in the North West was to transfer the findings from the Tir Gofal study and estimate the likely impact in employment terms if the same results applied in the North West. This was done through the following steps:

- Identify the number of employees and workers in the agricultural sector in the North West, using the Defra Agricultural Census;
- estimate the number of hours worked in agriculture by type (full time, part time, casual, contractors, male and female employees) and from this, the average number of days worked annually. These figures were validated against industry standard assumptions;
- using this data, estimate the number of FTEs by type that are dependent on agriculture overall in the region. The FTE figure for each type of employee was adjusted for the greater than average number of hours worked in the agriculture sector as a whole and validated against employment evidence presented in the Defra Agricultural Census;
- identify the number of agricultural holdings in the region. This was done through personal communications with Defra and through use of the Agricultural Census;
- allocate the increased number of days work (66 per holding) among contractors, farmers, farming family, existing employees and new employees, in accordance with the proportions found in Agra CEAS (2005).

The Defra Agricultural Census shows a total of some 39,000 full and part time staff in the region's agricultural sector. Applying the method outlined in the first three bullet points above converts this to a full time equivalent workforce of some 28,270. The results obtained from allocating the estimated increase in workload through agri-environment activities across the relevant agricultural holdings in the North West are shown in Table 4.

Much of the additional workload generated by agri-environment schemes is thought to be taken on by the farmer or the farming family. So while work is generated, since it is reasonable to assume that additional work done within the farmers' families is not remunerated, much of it is not necessarily paid employment. It is safer to assume that paid work is only generated for contractors, existing employees and new employees. Discounting the additional effects of 256 more farmers (whose employment, like that in the 'farming family' category, is only likely to be notional) suggests additional FTE employment of just over 500 jobs.

Table 4: Estimated Employment Impact of Agri-environment Schemes in the NW

Person day	Percent of work carried out	Days per site	Total days	FTE equivalent
Contractor	49	32	107,595	448
Existing employee	6	4	13,175	47
New employee	2	1.3	4,392	16
Sub total		4	125,162	510
Farmer	33	22	72,462	256
Farming family	9	6	19,762	150
Grand total			217,386	916

Note: Figures may not add exactly due to rounding. Contractor day assumes 240 contractor days per year. Farmer day, existing and new employee day assumes 283 days per year (ie at the rate of full time male), farming family day assumes 131 days per year (ie at the rate of part time male).

Source: Agra CEAS (2005), Defra personal communications and consultants' estimates

It is important to bear in mind that these estimated 500 jobs are the *additional* employment impact from extra agri-environment work. Without the agri-environment programmes and under a 'conventional' farming regime, these jobs would disappear.

In addition, there is another tranche of employment supported through work associated with agri-environment farming. These are the jobs that are sustained on agri-environment holdings, but which would be required anyway to farm the land if it were farmed conventionally (by which is meant, if the land was farmed without any of the environmental or land management requirements of the sort associated with Environmental Stewardship schemes). This total is estimated at 4900 more people (FTE) based on the average estimated labour requirements for holdings in the NW that are not signed up to agri-environment schemes. With these jobs added in, the estimated number of FTEs supported by agriculture which aims to protect or improve the environment is 5400.

Validation of Employment Estimates

The accurate estimation of employment within this sector is a difficult task without large scale primary surveys. Validation techniques employed here make use of the method referred to above in GFA Race/GHK (2004), also used in Environmental Resources Management (2004). Focusing first on the additional employment impacts, Defra's stated North West agri-environment budget for 2004-2005 as a proportion of total agricultural turnover is estimated at 3.2 percent. 3.2 percent of total FTE equivalent employment is some 890 – very broadly suggesting some 890 FTE jobs in the agri-environment sector. This is surprisingly close to the overall figure of 916 shown in Table 4. Looking at the wider number of jobs (ie those agri-environment jobs that would otherwise likely be supported by conventional farming) figures of between 5000 and 8900 jobs are supported, depending on whether the proportion of holdings or the proportion of total land area are considered.

In research carried out by the World Wildlife Fund (WWF, 2000) it was found that under the Countryside Stewardship Scheme, for each £1m spent, some 30 jobs were created. With a budget of £22m, this would imply the creation of some 660 jobs. Little information is given about the methodology used for this estimate or about the type of job created. But assuming these are 'real' jobs (rather than just extra non-remunerated work carried out by existing farmers and farmers' families) then this figure would compare with the 500 jobs highlighted above as being the additional employment impact from extra agri-environment work.

Estimating the Turnover and GVA Associated with Agri-Environment Activity

As a proxy for turnover, a minimum figure can be obtained through using the expenditure on relevant agri-environment schemes in the North West for year ending March 2005. This figure was £22.1 million (source, personal communication, Defra). The amount of GVA associated with this figure, using ONS (2002a) is estimated at £10m. This figure is a minimum and is only that directly related to the funding of the schemes (in this sense, it may be related to the 500 jobs quoted above). A wider figure can be estimated using the method adopted in GFA Race/GHK (2004). This is to apply a factor based on proportion of land used for agri-environment farming. In the North West for year ending March 2005, this was 31 percent (source, Defra, personal communication). This implies that 31 percent of total agricultural GVA of £701m (2002 data, the latest available) is attributable to agri-environment output – suggesting a figure of up to £220m. As for the 4900 jobs described above however, the majority of this would not be dependent on agri-environment schemes, since in the absence of such schemes, it would be generated through 'conventional' farming.

Organic Farming

As in the case of agri-environmental farming, there is limited data available on economic aspects of organic farming. Data is collected by Defra in York which is published regularly by National Statistics; this focuses on the number of holdings and area farmed, the number of producers and growers, type of farming etc. Much of this is available at regional level. Quantitative data regarding the *economic* performance under organic farming regimes is on the whole very limited, with most studies attempting economic assessments suggesting a percentage increase in labour use (eg Padel and Lampkin (1994) and Hird, (1997)).

At the time of writing the Centre for Rural Research/University of Exeter are very close to finalising a national study on the *Impacts of Organic Farming on the Rural Economy*; publication by Defra is expected imminently. This study is expected to highlight the North West's organic sector as being highly dynamic and developing very quickly from a relatively low base. Though the size of the North West's organic farming sector lags behind that of many other regions (especially the South West, which is the leading region and has about twice as much land under organics as the NW (Defra, 2005)), the growth rate in the NW now exceeds not just that of the South West but also of most other regions.

The organic sector and in particular its speed of growth is of interest in a study looking at links between the environment and the economy. This is because one of its principal characteristics is a tendency for closer and often direct relationship between the farmers and the consumers. Such a relationship offers greater scope

for farmers to increase their turnover, giving them (and the rural economy) an advantage in sales and marketing which is not so easy to come by in conventional agriculture where longer supply chains are the norm.

Estimating the Employment Contribution of Organic Farming Activity

The principal quantitative study looking at the economic impacts of organic farming is Defra (2002a), which surveyed 140 organic farms nationally that had recently switched from conventional to organic farming. Consistent with the other economic studies (referred to above) which reported increases in labour use on organic farms, this more detailed analysis reported the following changes in labour patterns following a switch to organic production:

- full time family labour -0.8%
- part time family labour +26%
- employed full time labour +4%
- employed part time labour +46%
- casual labour +90%.

As Offerman and Nieberg (1999) reported, quoted in Defra (2002b), it may not necessarily be the case that an expanding organic farming sector will cause linear rises in labour requirements – as organic farms become established and possibly larger, so they may become more efficient and labour saving technologies may be adopted. Nonetheless, with the absence of any other quantitative indication of labour use on organic farms, these figures were applied to the North West organic farming sector using a similar approach to that described above for estimating the impact of agri-environment farming.

The amount of land farmed organically in the North West is not provided under the Defra Agricultural Census so these figures were obtained from *Organic Statistics England*, Defra (2005). This source states that as of June 2005 there were 163 organic producers in the region. Using this data, and the reported impacts bulleted above, a total of 52 new, net additional jobs are estimated to be dependent on the organic sector. These agricultural FTEs are net in the sense that if the farms reverted to conventional farming they would no longer be required. Under a wider analysis, considering all jobs on organic farms in the NW, a figure of some 300 would be implied, based on the uniform distribution of employment in NW agricultural holdings, and the additional 'net' jobs directly dependent on organic activity. The implication, that organic farming requires around 20 percent more labour than conventional farming, is consistent with the percentage increases in labour use reported in Padel and Lampkin (1994) and Hird, (1997) which forecast increased labour requirements of between 10 – 30 percent. Using the coarser approach of assuming labour is distributed uniformly according to the amount of organic land relative to total agricultural land suggests employment of around 700 FTE in the organic sector. This figure would include additional (and probably notional FTEs) generated by farmers and farmers' families taking on additional (non-remunerated) work and would suggest organic farming is much more labour intensive than current evidence supports – more than twice as inefficient in labour terms than conventional farming.

Estimating the Turnover and GVA Contribution from Organic Farming Activity

Expenditure on organic farming in the North West through the Organic Farming scheme is very small – some £270,000 in the year ending March 2005 (source, personal communication, Defra), which would imply unusually small GVA and turnover contributions when looking at the core ‘net additional’ contribution of the organic sector.

Applying the much more crude overall estimates based on the amount of land being organically farmed as a proportion of the total (see GFA Race/GHK 2004, ERM 2004) produces estimates of around £17m GVA. However in the light of this technique’s likely overshooting on forecasting of agriculture based organic jobs (see above), we suggest that this figure is likely to be at the top rather than the middle of the likely range, and are unable to predict the GVA from organic farming with much confidence.

Countryside Sports

Within the context of this study, we define this heading as encompassing upland, lowland and wetland game conservation and management, deer management, as well as the countryside sports of shotgun shooting and stalking.

Shooting and stalking are part of the leisure market and in terms of an impact created through the spending of tourists, are considered under the tourism heading, so there is a potential issue of double counting about which we need to be aware. However in addition to expenditure and jobs created through direct tourism expenditure, there is also employment creation and expenditure generated through land management activities that take place regardless of any shooting activity.

There is very limited data or research material available which covers the economic impacts of this sector. The last significant work to have been carried out in the region (Cobham Research Consultants, 1997) was a national study published in 1997 and is now out of date. Given the lack of comprehensive data both nationally and regionally, a major piece of work is currently underway to estimate the economic impact of shooting and game conservation. An interim report is expected at the beginning of 2006 with final results being published later in the first quarter of 2006. This study, commissioned by a consortium including the British Association for Shooting and Conservation (BASC), Countryside Alliance, Country Landowners Association (CLA) and the Game Conservancy Trust is a survey based study that aims to be sufficiently large in scope such that statistically significant sample sizes will be achieved even at regional level. Until this report is published, economic data on game management and related tourism are hard to come by.

For the time being, the only reliable figures that are available relate to the economics of grouse shooting and we are grateful to the Moorlands Association for having provided them to us. The Moorlands Association estimate that there are around 107,000 acres of managed grouse moor in the North West. Using the estimated employment ratio of one gamekeeper to every 3,500 acres of managed moorland implies that there may be around 30 people employed on the maintenance and management of the region’s grouse moors. The associated annual cost of managing

this land (estimated at some £75,000 per 7,000 acre estate) suggests an associated management budget in the region of £1.15 million.

Clearly this is a subset of overall spend but estimating how large a subset is a difficult task. Lantra (2003) estimate regional employment of some 900 people in game conservation, though this may seem high given that ABI (2003a) estimates only around 1000 people in the whole of the UK employed in 'Hunting, Trapping and Game Propagation including Related Service Activities'. The latter however excludes hunting for sport and recreation regarding which there is no data at national or regional level.

We know that Visit Britain's data showing tourism spend in the North West suggests a small fraction of total tourism expenditure is committed to countryside sports. If the same fraction of jobs is dependent on countryside sports, this would imply around 400 tourism jobs, with the balance of 500 (making up the Lantra figure) working in non-tourism facing roles such as land management or gamekeeping. The figure of 500 FTEs compares reasonably to anecdotal evidence from within the industry putting the total number of gamekeepers, people involved in habitat protection and gamebird rearing at around 5000, of whom around 1500 are said to be part-time. These jobs attract a relatively low GVA per head such that total GVA in the North West's sector would be unlikely to exceed £8 million, with associated expenditure capped at around two or two and a half times that figure. To avoid double counting, tourism facing roles are not presented as part of this sector, but appear under the environmental tourism heading.

Fishing

An analysis of the contribution to the region's economy made through fishing was carried out based on evidence found in Drew Associates (2004), Radford, Riddington and Anderson (2005) and Mackay Consultants (2003), as well as rod licence sales and fishing activity data provided to us by the Environment Agency. This consideration of the fishing sector addressed freshwater (inland) fisheries as well as sea angling.

Regarding sea angling, the main centres in the North West are Barrow in Furness, Morecambe, Blackpool, Liverpool Bay and the River Dee. The approach employed was to take the overall England and Wales estimate of jobs and income from Drew Associates (2004) and adjust this downwards based on the proportion of known charter boats in the region and our understanding of the NW fishing sector, the latter drawing on regional evidence from the UK Tourism Survey (2003).

For freshwater fishing, total visitor spend was estimated based on regional data from the Environment Agency (which collects data regarding total days in the region spent fishing for salmon and migratory trout) and data from Mackay Consultants (2003) which includes spend and visitor type data for the Eden River basin. The Eden accounts for between a fifth and a quarter of fishing days for salmon and migratory trout. For other fishing (coarse and non-migratory trout) Eden data was extrapolated up to regional level. Total estimates suggest between 600-700 jobs might be supported by tourists' fishing spend, contributing a GVA to the region of around £7 million. This compares with UK Tourism Survey (2003) data which indicates that the sector might support around 850 jobs. These figures are included here as a matter

of record; due to double counting, the impact of fishing through tourism is counted under the tourism heading below.

It should be noted that these estimates exclude the commitment of the Environment Agency to the fishing sector in the region. This spend was not isolated in the EA's submission under 'Natural Environment Services Not Elsewhere Classified' (see above) and is therefore included under that heading.

Forestry

According to the *National Inventory of Woodland and Trees*, (Forestry Commission, 2002), the North West has some 8.8 percent of forestry cover in England, with significant variation within the sub-regions. Cumbria accounts for slightly over half of all woodland area in the region while Merseyside has only around 2.5 percent (Forestry Commission, 2002). There is widespread acknowledgement that the woodlands and forestry sector makes a significant direct contribution to the region's economy, but estimating the size of this contribution is made more complex because of the reach of forestry into other sectors (such as haulage, pulp and papermaking) and its contribution to the tourism sector.

Several research studies have already been completed considering the impact of the forestry sector on the North West economy. These address the sector's contribution in terms of employment created and/or turnover generated. The Lantra (2003) and ERM (2005) studies provide useful insights at a regional level while at a wider level the Forestry Commission's own *Forest Employment Survey* (2001) continues to offer a valuable benchmark for comparison despite its use of 1998/99 data sources. Meanwhile, Entec (2003) addresses the sector regionally but does so adopting a much wider scope than other studies. This report encompasses primary processing, haulage/transport, sawmills, pulp and paper manufacture, joinery and fabrication and timber trading as well as more specifically tree based services such as forest nurseries, forest management, harvesting and consultancy.

Using the intelligence provided by these sources, together with ABI (2003) and other data available from the Office of National Statistics, it is estimated that the number of people employed in the North West forestry sector is around 1,000-1,300, working in forest nurseries, tree production and harvesting, forest maintenance and management; as well as in strategic and policy areas. It is estimated that this level of activity is associated with a turnover of not more than £70m and an annual contribution to regional GVA of not more than £25m. It should be noted that these figures do not include any economic benefits that are derived from tourism spending; these are included under the tourism heading.

The following paragraphs provide more information on how these figures were estimated, addressing firstly employment, and closely linked to this, the issue of GVA.

Estimating the Employment Contribution of Forestry

ERM (2005) surveyed a selection of 50 of the region's forestry organisations selected for their relatively high profile in the sector. These organisations were active across the sector and included all of the main players (Forestry Commission,

community forests, not for profit enterprises, public and private sector organisations, government agencies etc). Private sector commercial forestry operators were not included. In total respondents were found to employ 700 full time equivalent staff. A larger sample of organisations surveyed (perhaps including more private sector operators) would be expected to push the number of FTE staff up beyond this figure.

Forestry Commission (2001) assessed employment in England and at the time of writing remains the most recent employment survey of the forestry sector. This provides estimates of employment by sub-sector (forest nurseries, establishment, maintenance, harvesting, road construction, other forest, haulage, processing etc) and if employment is split pro-rata based on woodland and forest coverage, implies employment in the North West of just over 1,250.

To validate the number of jobs estimated, we turn to available data on GVA, turnover and employment in the sector. ABI (2003) suggests that an average (national) figure for GVA per job in the Standard Industrial Classification of *Forestry Logging and Related Service Activities* is in the region of the low twenty thousands per annum. If up to 1,250 people are thought to be working in the North West forestry sector, this would imply maximum GVA for the sector of some £25 million. We now consider this in the light of findings presented below.

Estimating the GVA and Turnover Contribution of Forestry

Limited statistical data for the forestry sector is available at regional level, while more is available at national level through input/output data. ONS data tells us that the NW agricultural sector, of which forestry is a part, had a GVA of £701 million in 2002 (the latest year for which data is available). Meanwhile at a national level ONS (2002a) tells us that agriculture had a GVA of £8,336 million of which forestry accounted for £284 million. Thus, forestry comprises some 3.4 percent of the total national agricultural sector.

If this relationship holds at a regional level, then forestry's share of the £701 million regional figure for agriculture would be just less than £24 million (£701 million multiplied by 3.41 percent = £23.89 million). This is consistent with the £25m GVA figure implied by a workforce of 1,250 people. To estimate the amount of turnover generated by the forestry sector in the North West a GVA to turnover factor of 0.37 has been used. This is derived from ONS input/output tables for the sector for the United Kingdom as a whole (ONS, 2002a).

ENVIRONMENTAL TOURISM

Estimating the Economic Contribution of Tourism to the North West

The economic consequences of the activity of visitors to a particular area has never been easy to estimate. This is because tourists (or any other visitors) require a range of different goods and services (in addition to the usual accommodation and food). The TSA has emerged as the recommended way of measuring the economic significance of tourism, and is endorsed by the Department for Culture, Media and Sport (DCMS), as well as Visit Scotland, Welsh Assembly, the Northern Ireland Tourist Board and the European Commission. A satellite account is an extension to a System of National Accounts (SNA) which enables an understanding of the size

and role of economic activity which is usually 'hidden' in such accounts. For example, the SNA will not distinguish between the purchase of a newspaper by a tourist or a resident, but the TSA aims to do this. This enables more representative estimates to be made regarding the economic impact of tourism, both at the national and regional level.

The UK TSA has been prepared by Cardiff Business School (2004) and was followed at a regional level by the First Steps TSA Project for the English Regions (2005). The headline estimates of the contribution made by tourism to the North West region used in this report have been obtained directly from the English Regions Tourism Satellite Accounts (TSA) project (Cardiff Business School, 2005). The analysis considers all of the major sectors with which tourists customarily have some contact, plus other parts of the economy with which tourists may have less contact (for example, retail). The main sectors are:

- hotels and accommodation;
- second home and caravan ownership (imputed);
- restaurants, bars and canteens;
- railways, other land transport, water transport and air transport;
- other transport services;
- travel agency and tour operators;
- recreation services;
- renting of moveables.

A common practice in the past has been simply to group these activities by Standard Industrial Classification code, add up their GVA and employment figures, and present the total as being dependent on tourism. This could lead to over-estimation since a significant element of rail transport is carried out by commuters (not tourists) and many transactions in bars, restaurants or car rentals/taxi hires are also not tourism related.

The TSA attempts to get round this by seeking to identify only that contribution which is directly tourist related. For the North West region, tourism's contribution to regional GVA is estimated at some £2,750m, associated with expenditure of £7,400m (a ratio of GVA to expenditure of 0.37).

The TSA found that the total number of all jobs in the above sectors adds up to some 400,500 in the North West. Focusing only on the jobs that are entirely dependent on tourism reduces the number. The TSA estimates that the amount of tourism-specific GVA and expenditure identified within the region is associated with likely direct employment of around 134 000. This means that were it not for the tourism pound, some 134,000 people in the region – most in the sectors outlined above but also in other sectors like retail – would lose their jobs. While the figures from the TSA are not definitive, they are the best that are presently available and have been endorsed by the NWDA and DCMS as an *'indication of the nature and scale of the tourism in the region and an illustration of what kind of variables would emerge from a developed TSA'* (ibid).

For comparison, the employment figures estimated by the TSA are slightly lower than, but broadly consistent with STEAM figures for the region. STEAM is a model

used at the regional and sub-regional level for estimating tourism impact, around which there is a good degree of regional consensus. The most recent figures available from STEAM are for 2003 and estimate regional tourism employment of 140 000, associated with an estimated spend of £6.9 billion. STEAM does not estimate GVA contribution but assuming the TSA ratio of 0.37 applies, a regional GVA figure of around £2.55 billion would be implied.

Estimating the Economic Contribution of Environmental Tourism to the North West

Having obtained the headline data from the TSA project, it was necessary to attribute a proportion of this to 'environmental' tourism – ie to estimate how much of the contribution made by tourism to the regional economy was dependent on a high quality environment. Estimating the proportion of total tourism coming from environmental activity is a difficult task but the availability of a range of empirical evidence from large scale questionnaire surveys sheds light on the issue.

For the purposes of estimating 'environmentally' drive tourism, we have considered two broad categories of tourism - day trips and longer (staying) trips, and used available evidence to estimate what proportion of each has an environmental purpose. The method employed for estimating environmental tourism from day trips and from staying trips is shown below.

Day Trips

In the case of Day Trips, the key data source is the *GB Leisure Day Visits Survey (GB LDV, 2004)*. The results used here did not include responses from the Scottish and Welsh surveys, but instead focused on responses from some 3,200 interviews carried out in England, and in the North West where regional data was available. To answer the question of the extent to which the activity depended on a high quality environment, responses to the question 'what is your main activity by destination' were considered. The following activities were assumed to depend on a high quality environment:

- walk, hill walk or ramble;
- take part in sports, active pursuits, indoor, outdoor, field and water sports;
- visit park or garden;
- cycling, mountain biking
- visit beach, sunbathe, paddle in the sea.

These figures are published (at the England level) for three broad destinations: visits to town/city; visits to the countryside and visits to the seaside and coast. Data on these three destination types are available at a North West level, but the wider activity by destination figures are only reported for each destination type at the England wide level. To make the best use of available data, actual NW figures by destination type (town/city, countryside and seaside/coast) were combined with England wide activity data to estimate likely regional tourism by activity for each destination type. The results were then weighted to account for the distribution of day trip spend in each destination type (this is important because the spend is strongly biased towards town and city visits which have a lower environmental content – than for the seaside which has a higher environmental content). Using the

reasons cited by respondents for their trip, the analysis suggested that an estimated 27 percent of all tourism spend on day visits was motivated by 'environmental' tourism.

Staying Trips

The data source used for staying trips was the UK Tourism Survey (2003). This is an annual survey with a very large sample size (some 50,000) covering all trips away from home lasting one night or more for holidays, visits to friends and relatives, business, conferences or any other purpose. The main results are the number of trips taken, expenditure, and nights spent away from home. The 2003 survey is especially helpful because it includes a question asking respondents to report the activities undertaken during their visit.

Respondents were given a list of 36 activities and asked to report which (if any) they took part in on their latest trip. Around 86 percent of those interviewed reported at least one activity, with the highest responses for 'shopping' and 'short walks'. The following activities only were assumed to be dependent on a high quality environment:

- sailing, yachting, boating, canoeing, windsurfing (but not motor boat cruising);
- surfing;
- outdoor swimming;
- fishing –sea angling;
- fishing – coarse or game;
- shooting, stalking and hunting;
- horse riding and pony trekking;
- golfing (not mini golf);
- cycling;
- mountaineering, rock climbing, abseiling, caving and potholing;
- skiing on snow;
- nature studies;
- scuba diving;
- long walks (more than two miles);
- adrenaline sports (eg white water rafting, bungee jumping);
- visiting 'heritage' sites (castles, monuments, churches etc).

The UK Tourism Survey provides some degree of disaggregated results and because of the difference in the behaviour of those reported to be 'visiting friends and relatives' (VFR) and the wider group of respondents these two groups were treated separately in the analysis. The findings suggested that some 26 percent of the wider group were motivated by activities fitting within the 'environmental' scope, while the corresponding proportion for those VFR was 15 percent.

Overall Estimates

The final step was to draw the findings together from day and staying visitors and for those visiting friends and relatives and this was done by weighting the proportion of environmental tourism for each sub-group according to total tourism spend as

forecast by the 2003 STEAM model for the North West. Summary findings are shown in Table 5.

Table 5: Proportion of Regional Tourism Attributed to the Environment

Tourist type	Percent value spend	by of	Environmental trips by main activity	Environmental trips, holiday makers	all	Environmental trips, VFR	Weighted proportion
Day visitors	43.1		27.40%				11.81
Paying overnights	50.0			25.9%			12.95
Visiting friends and relatives	6.9					15.3%	1.05
Total	100.0						25.82

Source: STEAM (2003), GB LDV (2004), UKTS (2003), Consultants estimates

In arriving at a final estimate for a factor to be employed in estimating the overall proportion of environmental tourism, adjustment has therefore been made for day trips by destination type and value, staying trips by overall holiday-makers and VFR and finally for the overall relationship between day trips/paying overnights and VFR by value. The factor employed is 26 percent of all tourism by value.

Employing this factor with the regional output from the First Steps Tourism Satellite Account Project suggests that the amount of total tourism spend attributable to a high quality environment is an estimated £2,070 million. This is associated with GVA of some £770 million and an estimated employment level in the region 37,500 jobs.

Annex B

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Annex C

List of Academic Consultees

ACADEMIC CONSULTEES

We are grateful for the responses of the following institutions who provided information about their environmental activities:

- Centre for Air Transport and the Environment at Manchester Metropolitan University;
- Centre for Ecology and Hydrology at Lancaster University;
- Centre for the Study of Environmental Change at Lancaster University;
- Dalton Nuclear Institute at Manchester University;
- Lancaster University Departments of Environmental Science; Applied Sciences – Engineering; and Geography;
- Liverpool Hope University College Department of Science and Social Sciences;
- Liverpool John Moores University Departments of Science (Astrophysics Research Institute); Maritime; and Technology and Environment;
- Manchester Business School;
- Manchester Metropolitan University Departments of Environmental and Geographical Sciences; and Food, Consumer, Tourism and Hospitality Management;
- St Martin's College Department of Culture, Media and Environment;
- University of Bolton Department of the Built Environment;
- University of Central Lancashire Departments of the Built Environment and Environmental Management;
- University of Liverpool Department of Civic Design;
- University of Manchester Department of Chemical Engineering and Analytical Science; Department of Earth, Atmospheric and Environmental Sciences, and the Department of Environment and Development;
- University of Salford Departments of Environment and Life Sciences; Computing, Science and Engineering; and the Research Centre for the Built and Human Environment; and the
- Westlakes Research Institute.

In addition, our study of the NW academic sector includes the activities of a number of other organisations, details of which were researched as part of work on the development phase of the Joule Centre for Energy R&D in the North West. We are grateful to Richard Pearce for bringing these to our attention.