

GREEN JOB CREATION IN THE UK

**National Report submitted as part of the “Awareness Campaign
for Green Job Creation in the European Union” Supported by
European Commission DGXI Unit A2 Project no:306/68/24.4.96**

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Compiled by:

Association for the Conservation of Energy
Friends of the Earth
GMB (Trade Union)
UNISON (Trade Union)

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FOREWORD

ACE are pleased to have been involved in this important study. We are encouraged by the co-operation between environmental groups and Trade Unions on this vital aspect of sustainable development. We believe the results of this study prove beyond doubt that environmental protection, social and economic concerns should not be seen as opposing goals, but as a vital and exciting opportunity.

Association for the Conservation of Energy

The conventionally wise believe that creating jobs and looking after the environment are incompatible. This myth is one of the biggest blocks to progress towards a sustainable economy. That is why this report is so important. It demonstrates that environmental policies deliver large numbers of extra jobs - a heartening message for Unions and NGOs alike. Friends of the Earth warmly welcomes this initiative, and looks forward to similarly fruitful collaborations in the future for people, jobs and the environment.

Charles Secrett, Executive Director, Friends of the Earth

There has been a fundamental step change in the attitude to environmental issues by the public at large. Companies, governments and trade unions fail to adapt to this change at their peril. Through pressure from our members, the Trade Unions have begun to accept that environmental issues must be part of the main stream agenda. No longer can decisions by planners, companies and trade unions continue to consider the environment as an afterthought. The environment must be considered as part of the main stream planning process. Trade Unions and environmental organisations must work together to ensure there are sustainable well-paid jobs protecting the environment both in the work place and in the UK.

Mick Graham, National Secretary, GMB, Public Services

UNISON welcomes the publication of this important report linking protection of the environment with the creation of jobs. We believe it represents a successful co-operative working relationship between trade unions and green groups. We hope it will be widely read and its proposals will be acted upon by those in authority.

Unison

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ABBREVIATIONS

ACE	Association for the Conservation of Energy
CAP	Common Agricultural Policy
CHP	Combined Heat and Power
CO ₂	Carbon Dioxide
CSS	Countryside Stewardship Scheme
EST	Energy Saving Trust
ETSU	Energy Technology Support Unit
FOE	Friends of the Earth
FTE	equivalent to one person full-time for one year.
GMPTE	Greater Manchester Passenger Transport Executive
HEES	Home Energy Efficiency Scheme
NCN	National Cycle Network
NGO	Non-Governmental Organisation
PES	Public Electricity Supplier
SSSI	Special Site of Scientific Interest

1. INTRODUCTION

This report is the UK component of a European project co-ordinated by the Danish General Workers Union and the European Environmental Bureau, and funded by the European Commission. The aim of the project is to increase awareness of the potential for economic activities that simultaneously protect the environment and create jobs by presenting evidence from member countries of where this is actually happening.

This first section provides the context for the project and the following section explains the case study approach taken in the report. The five sections that follow examine individual sectors or components of the economy - agriculture, product manufacturing and servicing, energy, transport, and water. At the end of each of these sections are presented the policy options that need to be developed in the UK if the double dividend of job creation and environmental protection is to be fully realised.

Jobs and the Environment

Over the last few years the linkage between environmental protection and employment has attracted considerable attention. This has happened not because it is seen as a problem, but because it offers a vital opportunity. No longer are the two considered as opposing goals. The consensus view is that in producing public policy "it is possible and desirable to co-ordinate environmental and economic concerns".¹

The availability of sufficient jobs of high quality for present and future generations is vital to ensuring that improvements in people's quality of life are realised within the environmental constraints of the planet. However, the UK continues to suffer persistently high levels of unemployment. There is also real concern that in the large part these levels of unemployment reflect structural changes in the economy that have seen job intensity fall. Tackling this failure will require co-ordinated action across several areas of public policy. Environmental policy has a key role to play. As a communication by the European Commission released at the time of the European Employment Summit in November 1997 states "environmental policy, if well designed, should be seen as a strong driving force for investment and the building of a sustainable Europe, creating both growth and employment".²

The jobs gains that flow from this integrated approach are not new specialist 'green' jobs but they are made up of the same mix of skilled, semi-skilled and unskilled occupations. The

¹ Organisation for Economic Co-operation and Development, 1997, *Environmental Policies and Employment*, Paris, OECD.

² Commission of the European Communities, *Communication on environment and employment (Building a Sustainable Europe)*, 18 November 1997, COM(97) 592 final, Brussels.

employment created includes a full range of occupations from engineers, technicians, electricians, plumbers to project managers, drivers, builders and administrators. The two vital differences are that they are employed in a new sustainable pattern of investment and economic development and that there are more of them. The reason for this increase in employment intensity is that a sustainable economy is more efficient in its use of material and energy resources, requires technological change that places far less emphasis on reducing labour inputs and needs substantial investment in more locally based infrastructure.

The focus is now firmly on identifying the combination of policies that can realise this 'win-win' potential most effectively. Environmental non-government organisations (NGOs) and trade unions both have an important role to play in achieving this double dividend outcome.

Trade Unions and Non-Government Organisations

Making sure that environmental protection is delivered remains central to the work of NGOs but the development of the sustainability agenda over the last decade has emphasised the importance attached to the relationship between environmental protection and economic and social goals, such as job creation, protection of human health, poverty alleviation and social justice. In the UK, environmental NGOs have been at the forefront of researching, explaining and pushing forward the 'jobs and the environment' agenda.³

Trade Unions campaign for a clean and safe working environment for their members but they also want to see a clean and healthy environment outside the place of work for their members and families. Trade Unions are also well aware that employers that pollute the environment and waste resources risk prosecution and a loss of business that puts jobs at risk. As a result, Trade Unions in the UK have also pressed for better environmental standards and strategic thinking that integrates the need for job creation and environmental protection.

Both Trade Unions and NGOs have highlighted the issue of managing the transition between existing patterns of employment and those that will exist in a sustainable economy. Although job gains will out number job losses, those losses may be concentrated in particular parts of the country that may not be best placed to benefit from the job gains on offer.

³ Jenkins, T and McLaren, D, 1995, *Working Future? Jobs and the Environment*, Friends of the Earth, London; Jenkins, T, 1997, *Less Traffic More Jobs: the direct employment impacts of developing a sustainable transport system in the UK*, Friends of the Earth, London; Jacobs, M, 1995, *Green Jobs? The employment implications of environmental policy*, WWF, Brussels.

2. THE CASE STUDY APPROACH

The aim of this report is to provide evidence that will spur-on the process of policy reform based on the consensus view that calls for integration of environmental and economic concerns in order to protect the environment and create jobs. This report will therefore not review the many studies and surveys that have underpinned this consensus. Instead the focus here is on how this approach translates into changes in particular sectors and examples of where the double dividend of job creation and higher environmental performance has been delivered.

One consequence of this case study approach is that the evidence presented is often of varying scales, detail and type. We deal with the methodological issue of how job gains are measured below. The issue of scale is also important. Because many of the job gains will come in the form of gradual expansion of certain areas of an economic sector, case studies are more difficult to identify. In order to cover these wider trends, as well as provide actual project case studies, we have included a number of surveys and scenario modelling. Each case study is labelled accordingly in the sections below.

Calculating Job Gains

Any investment, scheme or project that creates 'green' jobs can do so in three main ways: by direct employment in the scheme; by increasing the employment in suppliers or through increasing local expenditure (the multiplier effect).

Direct employment may be generated in a number of sectors depending on the type of scheme. Investment in energy efficiency, for example, can create jobs in construction, manufacturing, installation, design, administration and marketing. Calculating these gains is comparatively straightforward. However, for many schemes or projects the estimates are incomplete, particularly with regard to jobs created in manufacturing. In the case studies of light rapid public rail systems, for example, there is no estimate of the employment gains in tram and tramway manufacture. For each case study the most complete calculation of direct job creation is included.

Permanent and temporary jobs will be created in most schemes. The construction of infrastructure, whether it is for energy efficiency, public transport or water supply, will all involve employment in the construction sector for a fixed period. In the case of temporary jobs, it is useful to talk in terms of both total numbers employed and the job-years of employment. For example, if 120 people are employed for 6 months this equates to 60 job-years. Where possible, we have included estimates of job-years for comparison between case studies.

The division between direct employment and job creation in suppliers, known as the linkage effect, is often not clear. Support industries may include component manufacturers, manufacturers of office equipment, suppliers of office services and the manufacturers of the

equipment used by industries involved in the project, such as scaffold manufacture for the building industry. The size of the linkage effect is dependent upon several factors, including the relative increase in demand experienced by the supplier, the labour intensity of the supply industry and the number of supply industries involved.

The multiplier effect refers to the employment generated by the boost to local spending power brought by an increase in employment. The value of this local multiplier effect is dependent upon a number of factors and can be calculated using a set of standard parameters.⁴ The Department for Education and Employment, however, use a standard figure that lumps the multiplier and linkage effects together.⁵ This figure of 0.17 assumes that in all cases 100 direct jobs created leads to a further 17 jobs indirectly. However, there are cases where this figure may not be the most appropriate. For example, where green investment leads to savings for individual households through managing the demand for energy, or water in some cases, the local economy will benefit from a more general increase in spending power on top of that from job creation. Some studies in the United States⁶ have suggested that this re-spending effect can be a major employment generator.

Accounting for potential job losses

It must also be acknowledged that for jobs created under most environmental initiatives there may be job losses in other sectors as a result. Naturally, the trade unions are concerned that these job losses are well-paid jobs in the organised sector of the economy. Increasing investment in and demand for renewable energy, for example, will reduce demand for conventional and more environmentally damaging sources of energy such as fossil fuels and nuclear, if the demand for renewable energy increases at a greater rate than total energy demand (as will have to be the case if sustainable development is to be achieved).

As mentioned above, the evidence is that the net impact on employment of increasing the environmental performance of the economy is positive. However, Trade Unions and Non-Government Organisations remain concerned that job losses may be concentrated regionally and occur over a short period of time. In suggesting policies in this report, we therefore

⁴ These include the current rate of personal taxation allowances, the marginal rate of deductions for those in employment compared to those unemployed, the marginal propensity to consume, the propensity to purchase goods and services from outside the local economy and the proportion of turnover accounted for by wages.

⁵ As used in: Department for Education and Employment, 1996, *The impact of redundancies on local labour markets and the post redundancy experience*, Research Studies RS23, HMSO, London.

⁶ For a review see Krier, B and Goodman, I, 1992, *Energy Efficiency: Opportunities for Employment*, Report prepared for Greenpeace UK.

address the need to design policy packages that maximise the job creation in those regions most likely to suffer from job loss.⁷

Policy Proposals

Each of the chapters that follow include a section describing policy proposals that are most likely to deliver the double dividend of greater environmental protection and increased employment. There are, however, a number of general points concerning appropriate policy that should be made first.

Policy is implemented at several geographical scales from local to European. As a result, not only must the roles of policy at each of these levels be clearly defined but all of these measures must be designed and implemented in an integrated manner. In the policy sections of the chapters that follow we have attempted to make both the distinctions and the case for integration clear. In the UK, the national level of policy making is dominant in most areas. The present Government has signalled its intention to increase the role of local and regional governance. We welcome this, but have related our recommendations mostly to the existing structure of policy making.

Policies need to be implemented at the appropriate level in the governmental structure whether at European, national, regional or local level. Some policies need to be implemented at all levels while others may be best implemented locally, for example cycle routes may be best implemented locally but as part of a national programme. New transport schemes such as light rail may be too large and expensive at a local level, but will be better suited to a regional level.

In the same way that integration of policy across these tiers of Government is needed, so is integration between the various policy instruments that can be employed in developing policy packages that protect the environment and create jobs. The proposals include a range of instruments including target setting, economic instruments, public expenditure measures, direct regulation, and information provision.

There are four general characteristics of policies that are most likely to maximise the double dividend.

First, policies need to be **clear, certain and predictable**. All policies aim to change behaviour and therefore need to send a clear message of what is required. It is equally important that there is, and there is seen to be, a firm commitment to the policy and its goals. The changes that will create jobs are major ones requiring investment by the private sector, government and households. Investment is inhibited by uncertainty. Policy packages that are clear, certain and predictable will encourage investment and changes in behaviour that will create jobs at the same time as protecting the environment.

⁷ For further discussion see Jenkins, T and McLaren, D, 1995, *Working Future? Jobs and the Environment*, Friends of the Earth, London.

Secondly, policies need to be **integrated**. Having policies that pull in different directions is bad for both environmental effectiveness and the creation of jobs. At present there are many examples of such inconsistency. Government spends money on information schemes to encourage greater energy efficiency yet taxes energy saving materials at twice the rate of energy use. The Government has quite rightly begun the process of making motorists pay for the environmental damage caused by cars, yet has failed to develop policies that ensure that investment and supply of public transport offers an attractive alternative. Agri-environment schemes aiming to enhance habitats are sometimes in competition with subsidies offered under the Common Agricultural Policy to such an extent that the effects of the former are nullified.

Thirdly, policies need to **effect fundamental change**. As the chapters that follow demonstrate, not only does the environmental side of the double dividend require fundamental changes in key sectors of the economy, but so does the employment side. Jobs will flow from the investment, innovation and increased labour intensity associated with transforming sectors, rather than modifying them.

Finally, policies need to have **appropriate timetables**. In sectors such as transport and energy, fundamental shifts are required that will need time to achieve. Policy packages must strike the right balance between driving up the pace of progress from its current inadequate rate and allowing firms, government and households to respond strategically. The Government's commitment to reduce CO₂ emissions by 20% over 1990 levels by 2010 provides a good example of a policy framework measure that makes clear the nature and magnitude of change required, but is realistic about the timescale for the change to be achieved. Some of the policy measures that will be required to achieve that target are included in the policy sections in the chapters that follow.

3. AGRICULTURE

Agriculture is an indispensable part of the management of the semi-natural environment. It is one of the fundamental sectors of any economy and the lifeblood of rural economies throughout the world. Yet the drive to increase output per hectare over the past few decades has brought major negative impacts.

First, the trends toward larger farm units, intensive production systems, increased mechanisation and increasing use of external inputs, in particular pesticides and chemical fertilisers, have resulted in employment in the sector plummeting. Between 1945 and 1992 the number of regular full-time and part-time hired and family workers on English farms fell from 478,000 to 135,000. The National Economic Development Council has forecast that during the 1990s a further 17 to 26 per cent will have been shed. Further jobs have been lost in rural communities as rural services, such as schools, local shops, doctors and public transport services, have contracted.

Secondly, the environment and biodiversity have suffered. Since 1945, the UK has lost 95 per cent of its wildflower-rich meadows, 30 to 50 per cent of ancient lowland woodlands, 50 to 60 per cent of lowland heathland, 140,000 miles of hedgerows and 50 per cent of lowland fens, valleys and basin mires.⁸ Changes in agricultural practice are the predominant cause of these losses. In addition, contamination of rivers, groundwater and drinking water from the use of artificial fertilisers and pesticides has become a major issue.

Two shifts in farming practice are required if agriculture is to develop sustainably: environmental conservation needs to be integrated into farming practice and farming systems need to be transformed from being chemically-intensive to organic. Both of these shifts have been shown to create employment.

Employment in UK Organic Farming (Survey Case Studies)

Recently the SAFE Alliance carried out two studies of organic farming⁹, covering over 800 farms. These indicated an increase in labour use on organic farms after conversion, which could represent over 400 full time equivalent jobs in the current organic farming community alone. The increased use of people in organic systems is as much to do with the new kinds of on-farm activities, such as processing and direct sales, as the actual farm work itself. In

⁸ Nature Conservancy Council, 1984, *Nature Conservation in Great Britain*, NCC, Peterborough.

⁹ Results of both are presented in: Hird, V, 1997, *Double Yield: Jobs and Sustainable Food Production*, SAFE Alliance, London.

addition, the extra returns provided by price premiums on organic food help to maintain these positive employment impacts.

The Welsh Institute of Rural Studies has assessed the labour use and incomes on organic farms across Europe.¹⁰ Such detailed studies of organic farming show a complex picture in relation to organic farming and socio-economic impacts. On full time organic units, overall income to labour ratio (i.e. the profit plus wages costs per Full Time Equivalent (FTE) family and employed labour) is better than on comparable conventional farms in the UK.

Much of the evidence on organic farming suggests that the benefits in terms of employment gains are related to both the type of activities (mixed farming, livestock handling, mechanical/hand weeding etc.) and the increase in value added processing that are characteristic of organic operations. Looking at Wales in particular, the research revealed that organic production can offer greater on-farm employment in marketing and processing and even better labour incomes from the farming itself. In one study, the labour and net farm incomes were higher in mainly dairy farms than on conventional, even when the value added through processing was deducted. The dairy and mixed farms did as well as or better than comparable conventional farms.

A survey of Soil Association Organic Symbol holders produced the following results:¹¹

Table 1: Employment before and after conversion

Employees (FTE)	Before	After conversion	Notes
Family/owner (unpaid)	49.5	78	60% increase in family labour
Permanent full-time paid	26	47	80% increase in full time labour
Permanent part-time paid	7	14.5	100% increase in part time labour
Casual	7	39	550% jump in casual labour*

* this is a very high figure, and it is possible that farmers may be underestimating the level of casual employment prior to conversion.

When asked their opinion, on average farmers estimated that the impact of conversion on employment was a 23% increase. The survey also indicated there has been a significant increase in labour use for activities such as on farm marketing, processing and packaging (13 farmers, using 23 more staff FTE in total since conversion which represents

¹⁰ Padel, S and Lampkin, N, 1994, 'Farm level performance of organic farming systems: an overview', in Lampkin, N and Padel, S (Eds), *The Economics of Organic Farming*, CAB International, Wallingford.

¹¹ Hird, V, 1997, Op cit

approximately 0.5 staff per farm), and a smaller emphasis on areas such as conservation works and management, game conservation, non-food crops, and training.

It should be noted that these figures give a snapshot of farmers' perceptions of the situation. They do indicate, however, a strong tendency for higher on-farm employment both in the fields and in other activities such as processing and marketing. Some of the larger farm businesses have had a huge increase in labour requirements, smaller ones less so. Average increases in non-field labour is an important factor and could represent 400 FTE jobs with the current 816 organic UK farmers.

UK Organic Farms¹² **(Individual Case Studies)**

An Organic Horticultural Farm in Lancashire provides a good example of organic farming creating direct on-farm jobs. Conventional operations used 2 family workers. Conversion to organic has created 7 permanent full time farm jobs, 2 part time and 3 casual. Mechanical and hand weed management and on-farm processing, packing and administration all provide extra employment and the farm employs more people than any other in the district.

Eastbrook Farm near Swindon is a 1,336 acre farm taken into organic conversion in 1984. It has a very diverse enterprise with 9 types of production and a highly successful meat processing and marketing business, Eastbrook Farm Organic Meats (EFOM), which provides direct sales from a shop and mail order. It is a good example of an efficient, lucrative business providing a high level of employment. There are 11 full time staff on the farm and a further 12 at EFOM. Originally the farm had two family workers and 4 full time staff and no marketing operation.

Manor Farm in Dorset is a 270 acre farm converted to organic between 1984 and 1988. It has dairy, ewes, feed wheat, straw and wheat reed operations and processes its own and other local farm milk. Since conversion, the number of on farm staff has increased from 2 to 5.6 FTEs, partly as a result of the new processing, packaging and distribution requirements, but also due to the conversion. In addition to selling lamb more locally, from selling all dairy produce centrally via the Milk Marketing Board sales are now 10% direct local, 60% to wholesalers and 30% supermarket.

English Countryside Stewardship Scheme **(Individual Case Study)**

¹² Taken from: Hird, V, 1997, *Double Yield: Jobs and Sustainable Food Production*, SAFE Alliance, London.

The English Countryside Stewardship Scheme (CSS) is a voluntary and discretionary scheme run by the Ministry of Agriculture Fisheries and Food to show that conservation and public enjoyment of the countryside can be combined with commercial farming and land management. A recent study¹³ examined the impact of the CSS on employment, farm inputs, farm output, farm and non-farm income, and ancillary industries up and down stream of farmers in the scheme.

Overall the CSS increased labour use on farm in two ways: a limited increase in use of farm labour and an increase in use of brought-in labour (such as contractors and advisors). Three quarters of work generated by CSS was undertaken by existing farm labour and a quarter by outside contractors. The net changes in the use of farm labour tended to be positive and were equivalent to 50 FTE when extrapolated to the whole of England.

The increase in use of outside contractors and advisors was more significant and grossed up to an annual impact at the national level the equivalent of hiring about 48,250 person days (about 200 FTE). The impact on production was negative particularly for cereals and beef/cattle, and was calculated to be equivalent to a national loss of £4.9 million annually. No overall significant conclusions can be drawn regarding the impact on farm incomes.

The knock on effects downstream are particularly interesting as this is where the impact on the local economy can be seen. Suppliers of inputs such as fertilisers and pesticides perceived little impact. Local businesses experienced a significant positive effect. This was mostly felt by small scale, specialist businesses. The most significant effects were seen in the use of local contractual and advisory services and an estimated 220 full time jobs have been created at the national level for an expenditure of £5.7 million.

Overall the positive effects appeared to be within the local/immediate vicinity of farms in the CS scheme. Small farms tended to have a greater level of positive impact on local businesses as they were more likely to buy inputs locally than larger farms. Negative employment and income impacts were found to be experienced more in urban areas remote from the farms.

While the overall socio-economic impact of the CSS was largely found to be neutral, this hides two key benefits. First, the very important contribution it makes to the creation of more locally based employment opportunities amongst small scale enterprises. Second, the replacement of less sustainable jobs by more sustainable ones.

Tir Cymen, Wales ***(Individual Case Study)***

¹³ CEAS Consultants, 1996, *Socio-economic effects of the Countryside Stewardship Scheme: Final Report*, Countryside Commission and University of Reading.

Tir Cymen is a pilot Welsh whole farm stewardship scheme created to encourage environmentally friendly farming in 3 areas of rural Wales. It provides supplementary income to farmers who fulfil the objectives of rehabilitating, enhancing and maintaining landscape, habitat and access opportunities. The average whole farm payment is £1,547 per year and 898 farms are involved. The effects of Tir Cymen on farming practices, family farm income, on the UK Treasury and on local economies in areas concerned have been investigated using 135 farms and 35 local businesses.¹⁴

Tir Cymen was found to have had a positive socio-economic impact both on-farm and off-farm. On-farm employment was enhanced and generated through the need for environmental maintenance work. The local economy was enhanced through jobs created in the purchase of materials and services by farmers in the scheme. The scheme increased casual employment by 98% in all farms sampled. Overall, extrapolating to cover all participating farms over the 1992-1995 period, 204 casual jobs and 62 person years of environmental work have been created. Local businesses have seen an increase in sales from Tir Cymen. 10 permanent jobs were created and 6 retained in local businesses as a result of Tir Cymen. This roughly equates to 2 person years per farm. One issue highlighted by this study was the importance of environmental schemes in retaining employees which would otherwise have been lost during hard times and periods of recession.

The All Party Select Committee of Agriculture and the Countryside recently examined agri-environmental schemes in the UK and recommended that an all Wales agri-environmental scheme (AWAES), along the Tir Cymen approach, would provide an efficient and effective method of helping both farmers and the wider Welsh community. Calculations on the costs of a scheme indicate a total cost of £23 million per year, that it could provide 1,230 person years (in full time jobs) of work (260 days/year) and save £11 million in welfare benefits.

Extrapolation of the local business impacts indicate 150-200 jobs created. Savings could also be found in fulfilling obligations under the EU Habitats and Bird Directives and for SSSI management. It has been suggested that tying this in with a food strategy, to add value and branding of produce, could create 3,000 new jobs. The Secretary of State for Wales has recently announced that such a scheme is being considered and has implemented a review to assess overall objectives and priorities.

Wildlife conservation (Survey Case Study)

There is a close link between farming, conservation and tourism. Without the features and habitats created and maintained by some farming systems, there would be far fewer visitors to the countryside. Many visitors come specifically to see wildlife.

¹⁴ ADAS, 1996, *Tir Cymen Socio Economic Assessment Final Report*, Countryside Council for Wales.

The Royal Society for the Protection of Birds (RSPB) has documented many cases of the socio-economic impact of conservation and wildlife enhancing farming systems.¹⁵ They calculate that the nature conservation sector provides more than 10,000 FTE jobs in Britain. In a recent report¹⁶ the RSPB describe how their Abernethy Forest reserve in Scotland is able to support 87 FTE jobs through direct and indirect impact on the local community and economy. Heathland management schemes in Dorset have created 67 FTE jobs in total.

In Scotland the economic value of wildlife tourism is well recognised. A recent report¹⁷ for Scottish Natural Heritage estimates that the direct employment related to the protection of the natural environment is 6680 FTE jobs. In addition to this direct employment a further 2200 FTE jobs are created through the visitor spending resulting from these activities. The usual multiplier effects can also be calculated. The majority of these jobs are in rural areas. For example a study on Islay and Jura estimated that £1.7 million was spent by visitors with a strong wildlife interest and 86 FTE jobs were attributable to that expenditure. Agencies there have been keen to ensure that farming and wildlife needs are made more compatible through, for instance, the formation of the Islay Goose Working Group.

Policy Proposals

The most important and fundamental policy reform required if the employment and environmental benefits of sustainable agriculture are to be realised concerns the Common Agricultural Policy (CAP). The present system of subsidies that focuses on market price support, input support and other production measures is environmentally damaging and distortionary. Although initial attempts have been made to correct this, progress has been painfully slow. As a priority the European Commission and the Council of Ministers must deliver wide reaching reforms of the CAP that direct subsidies towards whole farm and whole country agri-environmental schemes that provide viable incomes, new employment and environmental benefits. Organic and mixed farming systems must be encouraged as a key part of this priority objective.

At a national level, the Treasury and the Ministry of Agriculture Fisheries and Food must increase the budget for agri-environmental schemes, particularly those for the Countryside Stewardship and Organic Aid schemes.

¹⁵ Rayment, M, 1997, *Working with Nature in Britain: case studies of nature conservation, employment and local economies*, RSPB, Sandy.

¹⁶ Rayment, M, 1996, *Abernathy Forest Nature Reserve - its impact on the local economy*, RSPB, Sandy.

¹⁷ Mackay Consultants, 1998, *Jobs and the Natural Heritage in Scotland*, Scottish Natural Heritage, Edinburgh.

The Government should adopt a pesticide reduction target to complement the existing policy instruments that encourage the use of the least damaging and harmful pesticides. It should also introduce a nominal charge for chemical pesticides and fertilisers that provide farmers with an incentive to reduce their use of such inputs but which would also provide funds for information and advice schemes and grant-aid schemes for converting to less chemically intensive systems.

Target funds should be made available under the Environmental Task Force (under the New Deal Project) and Welfare to Work to provide skills for rural unemployed to work in farming and conservation.

4. PRODUCT MANUFACTURING AND SERVICING

The 'Delors' White Paper suggests that the European economy has developed through cheap resources, low-cost pollution and high cost labour. Our use of resources to produce goods exemplifies the point. Products with shorter and shorter lifespans, produced in increasingly centralised and mechanised plant are failing to create significant numbers of new jobs in manufacturing, rely on sectors of a low labour intensity (such as resource extraction and waste disposal), and are destroying jobs in labour intensive sectors such as product servicing and repair.

This can be a problem for Trade Unions. Membership is often concentrated in centralised manufacturing plants that are steadily reducing jobs numbers per unit output. Union membership is high in traditional resource extraction industries but low in the labour intensive sectors of servicing and repair.

Friends of the Earth recently used environmental space analysis to calculate the reductions in resource consumption for a small number of selected non-renewable resources needed in the UK to be on track for sustainability by 2010. The reductions are considerable but wider adoption of existing technologies and best practice makes it possible to attain those goals. These involve increased durability, product and component re-use and materials recycling. What is more the case studies below show that employment is created in doing so.

Create - Community Recycling Enterprise and Training for Employment¹⁸ **(Individual Case Study)**

Create is a new charity in Liverpool which aims to train long-term unemployed people to repair and reconstruct old fridges, washing machines and other white goods. Create has been set up with help from Thorn EMI. It acquires end-of-life and traded-in products from rental companies and from local council waste collections.

Create started with 12 trainees and by June 1997 had expanded to 30. The project aims to provide breakthrough opportunities for the long-term unemployed in Liverpool's inner-city. Create provides a two year training and development course to National Vocational Qualification level 2, and the work is waged after three months at £8755 a year, as opposed to other government training schemes that only pay £10 on top of unemployment benefit.

¹⁸ Personal communication, Nick Hughes CREATE Manager, 5 June 1997; Sunday Telegraph, 9 February 1997 "Gissa job..." page 6; CREATE, 1996, Media Information Pack; McLaren, Bullock & Yousuf, 1997, *Tomorrow's World, Britain's share in a sustainable future*, Earthscan, London.

Three of the former trainees have found permanent employment and interest has been expressed by companies for 9 others.

The scheme takes products which would have gone to landfill and rebuilds and repairs them to a high standard, such that all products are given a 12 month parts and labour guarantee. The finished machines are sold through charity shops in Liverpool and at factory shops.

Thorn funds the scheme and so far has provided £350,000 for start-up and running costs. Jim Donovan, one of Thorn's directors decided to direct its charitable donations towards CREATE because there was something in it for the company - "the core of our rental business is with the poorest groups in society. Thirty years ago, everyone rented electrical goods. Now, it's only for low-income people. We felt we needed to approach any corporate giving with that clearly in mind." Customer loyalty and concrete results were also important to the company - "we also wanted to find a project which would not give off any whiff of money down the drain, one which would show concrete and definite results. Create has done that in spectacular fashion."

Create hope to expand to other towns and cities in the UK. Currently, throughput is one machine per person per day: for 24 people in each of 100 towns and cities, this would be around 550,000 units a year. Assuming that these would be half washing machines (61 kg steel) and half fridges (24 kg steel, 2 kg aluminium), this would save 23,000 tonnes of steel, and 550 tonnes of aluminium, equivalent to 14,800 tonnes of primary steel and 380 tonnes of primary aluminium.

Rank Xerox¹⁹ **(Individual Case Study)**

Rank Xerox launched its Environmental Leadership programme in 1990 as a response to increasing competition from Japanese manufacturers and to increase its environmental performance. Since its merger, Rank Xerox has faced increasing competition from Japanese copier producers and has seen its market share and profitability eroded.

In 1984 the company responded with a quality programme. In 1996 the company won the European Better Environment Awards for Industry for its closed loop scheme for recovering and reusing end-of-life copiers in Europe. Newly manufactured leading edge products containing a small proportion of reprocessed parts from recovered equipment, and remanufactured products comprising mature equipment containing predominately reprocessed components, were put on the price sensitive markets. The company utilised its established system for collecting redundant equipment and then added three asset management centres at Venray in the Netherlands, Lille in France and Mitcheldean in Britain for disassembly.

¹⁹ ENDS Report 261, October 1996, *Rank Xerox: Towards waste-free products from waste-free factories*, p 18-21

The operation has increased in size since it was set up in 1993. At the time 30% was being recovered for dismantling, mainly used by the firm's service organisation. By 1995 the recovery rate had risen to two thirds, around 80,000 of the 120,000 machines. Of these 60,000 machines were remanufactured and sold, while 20,000 were used to provide components or spares. The company's target was to increase the recovery rate to 90% and it has already reached 70% in the Netherlands. Re-manufacturing has also been launched in Egypt and India.

Jobs have been created in the re-manufacturing process. Rank Xerox's first asset management centre at Venray employed 12 people when it was opened in 1987. Today the three centres employ more than 400 (although it is not clear how many jobs may have been displaced, but it could be argued that the re-manufacturing has protected jobs).

Last year Rank Xerox saved about £50 million on purchases of virgin raw materials by reusing recovered material. The sale of non-reusable plastic panels for recycling was also a net revenue earner. Further costs were avoided by diverting some 7,200 tonnes of material from landfill. This has led to a boost in Rank Xerox's market share and furthermore there have been knock-on effects on the design of components. Design for Environment principles are being applied within the company to ease disassembly and maximise the reusability and recyclibility of new products.

Recycling in the City of Bath²⁰ **(Individual Case Study)**

Bath has the highest recycling rate in the UK and has already achieved the 25 per cent recycling target set by the government for the year 2000. How was this done? City of Bath Recycling is a joint initiative by Avon Friends of the Earth and Bath City Council.

It was developed in constant consultation with householders in the city, carefully responding to their different situations. It became apparent that people were very keen to become involved in recycling schemes, provided that their individual circumstances were taken into account. Different collection schemes were tested. Initially collection was only carried out once a month but this increased to a weekly service in 1991. Box sizes vary according to property size with 23 and 44 litre boxes and a mini recycling centre for large blocks of flats. However residents can swap over boxes according to their needs.

A weekly green box service was organised, with ten specially adapted collection vehicles, with a staff of 23 in 1996/7 that had increased from 6 in 1993/4. The scheme services 35,000 households, however with the reorganisation of local government areas and the

²⁰ Warmer Bulletin no. 50, Bath and North East Somerset Council, May 1996, *Green Boxes and partnership: keys to successful recycling in Bath*; Personal communication with Bath Recycling Officer, David Mansell on 12 th June 1997.

creation of a unitary authority, the overall population has doubled. These are provided with green boxes of various sizes according to their circumstances. Paper, cans, glass and plastic bottles are sorted on special sorting lines. In addition, over 2,000 compost bins have been provided to people with gardens. In 1996 some 4,000 tonnes of waste is being recovered by the scheme.

In a survey carried out in 1994/95, the Bath scheme had a participation rate of 69% of households who used the collection scheme at least once a month. However this rate has increased since then with total tonnage also increasing. This approach means that Bath has already met the 25 per cent target, with rates for glass at 72 per cent and paper at 63 per cent, although only 20 per cent of aluminium cans are recycled. Every month 234 tonnes of paper, 141 tonnes of glass, 18 tonnes of steel cans and 6.8 tonnes of aluminium are collected. This adds up to 2.5 kg per person of steel, and 0.96 kg per person of aluminium each year.

If the UK were to reach Bath's recycling levels this would save 120,000 tonnes of steel, and 47,000 tonnes of aluminium. But the potential to go beyond 25 per cent is clear. In Bath, little waste is rejected because of contamination (less than 3/4 of a tonne each month). The key need is to increase participation rates still further.

Markets for the waste material collected are using already established markets e.g. paper, glass, steel, aluminium and plastic. In the case of aluminium and plastic, waste companies are importing from other parts of the world to meet demand. Plastic collected in Bath is sold onto Linpac which produces Bath's compost bins. Therefore there is a potential to increase employment opportunities in the markets dealing with recycled materials as Britain's recycling rate increases.

WyeCycle **(Individual Case Study)**

WyeCycle is a not-for-profit community business, formed in 1989 to 'protect the environment and create employment through the reduction of waste' in Ashford, Kent. Originally set up by a Wye College student in response to hearing people complaining about the 'throw away society', but not doing anything about it.

Paper, glass, metal, textiles, organic material and garden waste are collected every Monday. In addition to this weekly service, a monthly collection is provided for any other reusable items - furniture, tools, wood, paint, electrical goods, toys and games. Businesses in Wye also receive a weekly collection and this has led to 75% less waste being produced and saving of £10,000/yr for Wye businesses. Households participating in the scheme produce less than 100kg of waste per year, compared to the national average of 1000kg.

Financing for all this work comes from two sources; selling collected materials for recycling (£10/tonne - £450/tonne) and a credit of £15/tonne from the local authority. This payment from the council is in recognition of the savings made on dumping the materials collected. WyeCycle now employs three full-time and three part-time staff. The scheme services a

relatively small community of up to 3000. Consequently, the potential for the country as a whole is considerable if similar schemes were to be adopted nation-wide. (Note: UK population in 1993 was 57.988 million. Population of Wye is approx. 3000, therefore the potential number of jobs would be $57.988\text{m}/3000 \times 4.5 \text{ jobs} = 86,982$ potential jobs.)

Newspaper Recycling in the UK (Scenario Case Study)

Recent research commissioned by Friends of the Earth examined the implications of increasing the recycled content of newspapers including the impact on employment. Increasing the recycled content of newspapers would effect an increase in the rate at which newspaper and magazines are collected and recycled in the UK. The targets for recycled content were based upon existing best technologies and a realistic timetable for investment in the infrastructure for both collecting and processing recycled newspaper. The final target of 80% recycled content by 2010 would require 50-60% recycling rates that are already being achieved in some other countries in the European Union.

The scenarios used government and industry figures produced the following results:

Table 2: Job creation for levels of recycling of newsprint

Target recycled content of newsprint	65% by 2003	70% by 2006	80% by 2010
Increased recycling	490,000 tonnes	590,000 tonnes	810,000 tonnes
Reduced import costs	£106 million	£127 million	£175 million
Wealth creation	£75 million	£91 million	£125 million
Landfill Savings	£25 million	£30 million	£41 million
Employment created	5,880 jobs	7,080 jobs	9,720 jobs

The bulk of the jobs created would be in the collection side of the recycling operations. There would also be jobs in additional reprocessing and investment in the collection infrastructure.

Policy Proposals

It is vital that the forthcoming National Waste Strategy provides the sort of long-term framework that the Government's CO₂ reduction has for energy policy. It particular it should place an emphasis on reducing waste in the first instance and, following that, choosing the best waste management option. The following measures would all help to stimulate greater employment in the sector:

- a target for increasing the recycled content of newsprint to 80% by 2010 with interim targets of 65% by 2003 and 70% by 2006;

- further increases in the landfill tax preferably using an escalator similar to that for road fuel duty with provisions to include incineration within the tax;
- a proportion of revenue from the tax to be made available for local authorities to invest in recycling collection infrastructure that ensures that the jobs created in these activities are quality jobs;
- introduce an aggregates tax that provides a stimulus for increasing recycling of demolition waste and would increase employment in doing so (further employment gains could be made by using the revenue from the tax to reduce employers national insurance contributions);
- direct monies from the ENTRUST scheme set-up in conjunction with the Landfill Tax more tightly at activities that reinforce the purpose of the tax, predominantly recycling schemes.

5. SUSTAINABLE ENERGY

There is now a consensus that climate change, caused primarily by the combustion of fossil fuel to meet our energy requirements, is beginning to occur and it is anticipated that it will have serious effects. In 1992 in Rio, the UK signed the Framework Convention on Climate Change and along with other developed countries agreed to return emissions of greenhouse gases to 1990 levels by 2000. In December 1997, the parties to the Convention met again at Kyoto, and agreed to cut emissions of the six main greenhouse gases by 6% below 1990 levels between 2008 and 2012. In addition, the UK Government is committed to reducing CO₂ emissions by 20% during this period.

In order to meet this target substantial progress must be made on a number of fronts. In the short term it is vital that energy demand is reduced by increasing the efficiency with which energy is used and that the carbon intensity of power generation is reduced by increasing the proportion of energy that is supplied from renewable sources. In the medium term there is a need to transform energy markets from being focused on selling units of energy to selling energy services and to reduce the material intensity of the economy. There is concern that under the newly privatised UK energy systems none of the energy companies has the incentive to do this.

In addition to having environmental benefits, energy efficiency is also important socially. It is estimated that 8 million low income families in the UK are living in homes that are too energy inefficient for them to heat adequately.²¹ This results in 30,000 – 50,000 extra deaths each winter. Improving the efficiency of a home and thereby making it cheaper to heat has obvious social and health benefits for the 'fuel poor', with reduced incidences of hypothermia and cold-related illness.

There is also an increasing realisation that the promotion of 'sustainable energy use' has another social benefit – the creation of jobs. Renewable energy supply tends to be more labour intensive than the conventional supply side, while the promotion of energy efficiency creates jobs in the manufacturing and installation of materials. The case studies presented below include examples of both renewable energy and energy efficiency schemes.

Employment

Energy efficiency programmes involve two major types of employment. First, in project administration, which includes project development, marketing, advice and monitoring; and second, in installation. Many of the jobs created in installation are suitable for the long-term unemployed if the necessary training schemes are set up (see the Heatwise Case Study). Such schemes can therefore offer additional social advantages. In addition to the indirect

²¹ Boardman, 1991, *Fuel Poverty: From Cold Homes to Affordable Warmth*, Bellhaven Press, London

effects that are common to any scheme involving job creation, energy efficiency schemes also have the benefit of an increased multiplier effect as a result of the increased spending of those who have saved money by having lower fuel bills. It should be noted, however, that increased energy efficiency does not always result in reduced fuel use as some will be taken to provide increased comfort, particularly where the schemes have been aimed at previously under-heated homes.

Renewable energy projects will involve the manufacture of generating technologies and the components involved, and the installation, operation and maintenance of the plant. The majority of these jobs will tend to be skilled compared to the higher number of semi-skilled or unskilled installation jobs created in the energy efficiency sector.

The potential for more immediate and substantial employment gains lies with energy efficiency. Renewable energy will require time to develop and therefore although the employment creation potential is significant it will not be realised in the short-term. Yet investment in both is needed immediately.

Case Studies

The case studies presented here are a mixture of national and small scale local projects covering both renewables and energy efficiency. Some have included employment effects in the written reports on their projects, whilst for others an estimate of the number of jobs created by the scheme has been obtained by interviewing those involved with the project. For most projects there has been no attempt to calculate indirect effects on the wider economy.

Standards of Performance for Energy Efficiency (Survey Case Study)

Standards of Performance is a programme run by the Energy Saving Trust (EST) and is designed to stimulate the provision of cost-effective energy saving measures throughout all sectors of the electricity franchise market. The scheme is funded via a customer levy of up to £1 per year for each customer, amounting to a total of £25 million over a four year period (1994-1998). The Public Electricity Suppliers (PESs) are required to give priority to schemes likely to exert general downward pressure on the charge per kWh to consumers in order to encourage demand side management measures. All customers should be included, but priority is given to those on lower incomes or with particular disabilities.

A study conducted by ACE for EST and UNISON²², calculated that the scheme has generated 394 full time jobs per year over the four years, of which approximately half are in installation and half are in project management and administration. The estimates were achieved by conducting telephone interviews with installers, face to face interviews with PESs and telephone interviews with housing providers.

The time required for each task, as estimated from these interviews, was multiplied by the total number of schemes carried out under the programme to give a total national figure. The study also calculated that a total of 67 indirect jobs have been generated, using a multiplier of 0.17. Negative effects were considered in the report, but found to be negligible. This was based on PES information that the effect of the programme would have minimal effects on the supply industry because: (i) the number of kWh saved is very small compared to that supplied; (ii) the profit of the supply company is now only partly related to volume provision; and (iii) the work effort required by the supply company has very little to do with units supplied. Other economic effects were discussed but found to have minimal effect in this particular programme.

The cost per job-year was calculated to be £25,700 for labour costs plus an associated materials cost of £19300 for direct jobs, giving a total of £45,000. Adding indirect jobs into these calculations gives a cost of £39,000 per job.

Heatwise²³

(Individual Case Study)

Heatwise is a programme operated by the Wise Group, which aims to create an intermediate labour market, i.e. recruit and provide training and work experience for unemployed people so they can improve their job prospects. The Heatwise element of the programme is responsible for the Jobs and Energy Project, which aims to:

- identify the extent of, and develop solutions to, the problems of cold, damp and expensive to heat housing.
- identify employment and training opportunities for local people through improving the heating and the insulation characteristics of the local housing stock.
- put together funding packages to initiate heating and insulation improvement projects.

²² Association for the Conservation of Energy, June 1997, *Direct and Indirect Job Creation from the Standards of Performance for Energy Efficiency Programme*, Report to the Energy Saving Trust and UNISON.

²³ The Wise Group, 1994, *Annual Review*; The Wise Group, 1995, *Going Beyond Draughtproofing, A report on the activities of Heatwise Glasgow Jobs and Energy Project November 1987 - November 1994*.

58% of trainees who finish the course go on to permanent employment or further education within three months of leaving. This compares with a national average figure of a 5% chance of a long term unemployed person finding permanent employment.

The programme, which has been operating since 1987, is funded by a variety of sources, including UK local and national authorities and the European Commission, as well as from commercial sales of the organisation's services.

In 1994 the group as a whole employed a total of 795 people. 230 of these were permanent employees, and 565 were trainees on their various programmes. More than half of these were employed in the energy efficiency sector. Adding in jobs created in the manufacturing sector, this figure is likely to be doubled.

The total expenditure by Heatwise for 1994 was £12.8 million, implying a cost of £16,100 per employee (this excludes third party costs).

The Green Estates Challenge²⁴ **(Individual Case Study)**

The Green Estates Challenge is a programme run by Newark & Sherwood District Council and was designed to improve the energy efficiency of the council's housing stock. The programme, which commenced in 1988, is funded entirely by the council. It was originally planned that a total of £16.4 million would be spent – in fact the project had to be abandoned in 1995 due to reduced public sector funding for housing, with a total of £8 million having been spent.

A study by the council estimated that a total of 311 job-years have been created by the programme, including direct and induced employment effects. This figure is reached by using methods set out in a 1992 American study as well as figures from British Gas on employment generated from the installation of boilers. The programme has involved partnerships with Newark Chamber of Commerce, Sherwood Energy Ltd (a non-profit training organisation, with 9 of the current staff previously unemployed), the Groundwork Trust, HEES contractors and local plumbing contractors.

²⁴ Personal Communication, David Pickles, Chief Architect, Newark and Sherwood Energy Agency.

The cost per job year can be calculated as £25,700. However, the Council's study also estimates savings to the health service at £2.2 million and unemployment cost avoidance at £2.8 million, giving a net cost of just £9,700 per job year.

Combined Heat and Power (Scenario and Individual Case Studies)

Combined Heat and Power (CHP), involving the utilisation of 'waste' heat produced in conventional electricity generation in heating systems, is widely recognised as having a key role in achieving sustainable development in the UK. A study conducted by The New Economics Foundation²⁵ in 1995 found that a growth in the CHP sector would support a substantial number of jobs.

The widespread use of relatively small CHP units is inherently more labour-intensive than the supply of power through larger scale traditional electricity-only power stations. The study forecasts a growth in the CHP sector of 6GWe by the year 2000 which would create around 8,000 jobs directly, with many more created from the re-spending effects generated by energy cost savings in the industrial sector.

In Nottingham a CHP unit provides an example of job creation from a community heating system. The unit, which serves 4,300 council dwellings, went through a major modernisation in 1995. A total of £6 million was spent on laying new pipes, of which around £4.5 million was spent on labour. The study estimates that this programme generated around 125 job-years, of which 100 were involved in laying new pipework, 17 in installing meters and heating controls, and 8 in operation and maintenance. These can roughly be split evenly between skilled and unskilled labour. Around half the workforce was found to be local, with others commuting in from nearby towns. The cost per job-year works out at around £36,500.

The UK Renewable Energy Industry (Scenario Case Study)

In a report by ECOTEC²⁶, the costs and employment implications of renewables compared to conventional power generation are investigated. The study uses data for costs of both types of generation and applies it to an input-output model of the UK economy to define the net direct and indirect employment potential. The aim of the study was to estimate the future market potential for renewable energy; to estimate the direct employment at all

²⁵ New Economics Foundation, 1995, *Combined Heat and Power: The Impact on Employment*, Combined Heat and Power Association, London.

²⁶ ECOTEC Research and Consulting Ltd, 1995, *The potential contribution of renewable energy schemes to employment opportunities*, K/PL/00109/REP, Report for ETSU Harwell.

phases of production and operation; to estimate displacement effects; and to assess the net employment opportunities.

Estimates were based on two methodologies. First, the employment in existing projects was investigated via telephone interviews and grossed up to a national figure. Secondly, the projected labour costs were used along with an average cost per job to find the total number of people likely to be employed.

By 2005, the report estimates a total of 48,700 direct jobs in this sector. Taking into account the displacement from conventional plants, waste disposal and from expenditure on subsidy, and using a multiplier of 0.5, the net employment creation was calculated to be 11,600. For a total cost of £270 million in the form of a subsidy, this gives a cost per job of £23,300 (with a total cost of £60,300 including third party financing).

The British Wind Energy Industry (Survey Case Study)

A survey conducted by the British Wind Energy Association²⁷ found that the wind energy industry in the UK employed a total of 1,313 people full time in 1994-5. The survey covered all the sectors involved in wind energy. Responses were obtained from approximately half those mailed, and multiplied up to obtain a national estimate for the period April 1993 to March 1995.

The report uses a multiplier of 0.7 (based on a study in Scotland²⁸) to give a total of 2,200 jobs. (This multiplier is higher than that used in most employment studies). Negative effects were not calculated, but if the figures compiled by ECOTEC (see previous study) are applied then the net gain is 1,450 jobs.

Most of the jobs created are in the engineering field, and can be broken down in terms of jobs/MW installed as follows:

- Civil engineering: 0.93
- Electrical installation: 0.34
- Installation of turbines: 0.18
- Project engineering: 0.14
- Total for an average windfarm: 1.60

Renewable Energy Systems

²⁷ North Energy Associates Ltd, 1996, *Survey of Employment in the UK Wind Energy Industry*, ETSU W/13/000354/47/REP.

²⁸ Alexander, J M and Whyte, T R., Winter 1994-5, *Output, Income and Employment Multipliers for Scotland*, Scottish Economic Bulletin.

(Individual Case Study)

Renewable Energy Systems is one of the UK's longest established wind energy companies. Started in 1981, the company provides a total package of services encompassing all aspects of the wind farm development process, including the site selection, technical and engineering work and financing.

The company employs 24 full time staff, of which 9 are involved in research and development, 11 are involved in construction, operation, maintenance and the technical aspects of wind farms, while 4 are administration staff. In addition, the company may employ up to 50 subcontracted staff from its parent company, the McAlpine Group, during the construction phase of a windfarm. Hence an average of around 20 additional job-years are created each year.

Policy Proposals

Targets

The Government is committed to a target of a 20% reduction in CO₂ emissions by 2010. Current policies cannot achieve this.²⁹ A strengthening of these policies, and other new ones, will be needed in order to realise this level of environmental protection and to achieve the supplementary target of increasing employment.

The target of 10% of electricity generation for renewable energy by 2010 and of 5GW of industrial CHP by 2000 (and the provisional target of 10GW by 2010) will also provide frameworks for ensuring policies are directed at increasing funds and support for these areas. In the long term these will provide significant opportunities for employment as both use higher intensities of labour than the conventional supply of energy. Community heating schemes in particular are labour-intensive and have a potential of over 3GW.³⁰ Most of the possible employment in the short term, however, will arise from the installation of energy efficiency measures.

Policies are needed to discourage the consumption of energy and to provide a level playing field for the promotion of renewables and CHP. This requires a combination of sticks and carrots to move towards a sustainable use of energy where emphasis is on provision of energy services at least social cost, rather than energy consumption at lowest possible price per unit of energy. The following policies will go some way towards achieving this goal.

Economic Instruments

The tax regime for energy needs to be reformed in order to reflect the environmental costs associated with each energy source and, in particular, to help ensure that the UK's and

²⁹ see, for example: Electricity Association, October 1997, by ACE and Imperial College Energy-Environment Policy Research Group, *A realistic strategy for reducing greenhouse gas emissions in the period 2000 to 2010 using improvements in energy end-use efficiency*, London.

³⁰ ETSU, Assessment of CHP Potential, July 1997.

Europe's targets for reducing CO₂ emissions are met. Revenues from tax changes should be used in part to reduce taxation on labour and in part to ensure that existing inequalities, such as fuel poverty, are reduced rather than exacerbated. We support the existing proposals to reform the Directive on excise duties paid on fuels in this way. At a national level the first step should be Government opening a debate on how a carbon tax might be introduced in a manner that is able to achieve environmental, social and economic goals.

Public Expenditure

Activities under the Home Energy Conservation Act, which puts a duty on the relevant authorities to plan increases in energy efficiency of 15% in their area, could be supported by more public finance. The activities have been successful to date in attracting significant private sector finance using relatively small amounts of public sector money and have also created local employment.

Information barriers are being addressed, although some areas of weakness remain: more explanation of energy labelling is needed, and detailed information on specific measures should be made more readily available to the public. Additional measures for the supply chain are also needed: retailer training and technology procurement are two areas that would complement an expansion of existing labelling, minimum efficiency standards and voluntary agreements.

Regulation

Opportunities for saving energy in new housing should be exploited by further tightening of the building regulations. Simple tightening of the present regulations will have significant long-term benefits, but the direct impact on the overall energy efficiency of the housing stock by the year 2010 may be relatively small. However, widening the regulations to incorporate tightening of the standards in existing buildings (for example, at time of refurbishment) would increase the impact in terms of energy savings and in employment creation both in the manufacturing and the construction sectors.

The Government's Green paper on regulation, published earlier this year, discussed the possible framework for the energy Regulator to take into consideration the environmental effects of the sector. The proposal in the paper was that environmental protection should remain a secondary duty directed by Government guidance. Whether or not this will ensure the desired level of environmental protection will depend specifically on the strength of the guidance. The alternative would be to make environmental protection a primary duty along with economic considerations but this would then mean that a single person, the Regulator, is responsible for decisions that should rightly be the Government's. We recommend that the Government provides strong guidelines, that the Regulator is replaced by a board of regulators, and that this board has a primary duty to take the environmental guidelines into consideration.

The Standards of Performance scheme, carried out by the electricity companies, successfully increased cost effective investment in electrically heated homes. If a continuation of this type of activity is considered appropriate, it should be extended to include gas customers. Concerns about competitiveness in the liberalised market mean that a levy on the monopoly sectors of the gas and electricity industries would be preferable to a simple expansion of the scheme as it now operates. An additional method of ensuring that

energy saving measures are promoted by energy supply companies, would be for a duty to be imposed on the suppliers to provide and promote a loan scheme for such measures.

6. TRANSPORT

The transport sector is a key sector in the 'jobs and environment' debate. On the one hand it makes a substantial contribution, directly and indirectly to national employment. On the other hand, in its current form it poses major environmental threats. As the fastest growing source of CO₂ emissions in the UK, transport is a major contributor to the threat of climate change: road transport alone accounts for 20% of total national emissions. Pollutants from car and lorry exhausts in urban areas "*are the prime cause of poor air quality that damages human health, plants and the fabric of buildings*".³¹

Public concern over these negative impacts has led to a new political consensus that transforming the transport sector requires urgent attention. The basis of the consensus is that allowing road traffic growth to continue at its present rate is not an option; it is unsustainable. There is also some broad agreement on what needs to be done, such as increasing the provision and use of public transport, encouraging walking and cycling, and adopting planning policies that reduce the need to travel. It is now vital, therefore, that a coherent, radical and effective package of policies is developed and implemented swiftly. The case studies below look at the employment impacts of achieving such a shift in the sector and provide indications of how NGOs and Unions can help to stimulate these changes.

Direct Employment Impacts of a Sustainable Transport Scenario for the UK in 2010 (Scenario Case Study)

Last year, Friends of the Earth published research³² that calculated the likely direct employment impacts of the UK making realistic progress toward developing a sustainable transport system by 2010. The scenario used targets suggested by the Royal Commission on Environmental Pollution concerning the increased use of public transport and cycling and the target of a 10% reduction in road traffic included in the Road Traffic Reduction (National Targets) Bill, currently before Parliament. In addition to this baseline scenario two variations affecting the car industry were modelled by ECOTEC for Friends of the Earth, which included an increased uptake of new less environmentally damaging vehicle technology and an increased uptake of car leasing as opposed to ownership.

The increases in cycling, bus and rail travel all generate direct employment which results in a total employment gain of 130,000 jobs. The cycle industry accounts for 9,000 jobs, most of which are in manufacture and sales. The operation of bus services is responsible for

³¹ Royal Commission on Environmental Pollution, 1994, *18th Report: Transport and the Environment*, p124, HMSO, London.

³² Jenkins, T, 1997, *Less Traffic More Jobs: The direct employment impacts of developing a sustainable transport system in the United Kingdom*, Friends of the Earth, London.

most of the 31,000 extra jobs created by the increase in bus travel. Job gains in the rail sector are more difficult to estimate due to current restructuring of the industry. The research estimates that 90,000 jobs will be created under the scenario with the lion's share being generated by a programme of investment in the rail network that is vital if it is to play its full part in a sustainable transport system.

Under the scenario, the reduction in the use of cars will result in a loss of jobs in motor manufacture and maintenance, and in the petroleum industry. The figures used assume a worst case scenario where the reduction in car numbers is proportional to the reduction in car usage, but this is unlikely to happen. However, the modelling work demonstrates that, despite job losses, shifting the car-based industries themselves towards sustainability, through the uptake of cleaner, more efficient technologies and a wider use of leasing, can partially offset those losses by increasing the employment intensity of the sector. The baseline scenario effects a loss of 43,000 jobs in the car-based industries from oil production to petrol filling stations. The high-technology scenario reduces those losses to 23,000 and when combined with a high leasing rate the loss is 8,000 jobs.

The net employment impact of this shift in the transport sector is an increase in employment ranging from 87,000 jobs by 2010 under the baseline scenario and 122,000 jobs under the advanced scenario for the car industry.

The Manchester Metrolink Light Rail System (Individual Case Study)

Background

The Manchester Metrolink light rail system was conceived in the early 1980s by the Greater Manchester Passenger Transport Executive (GMPTE). Phase one of the proposal was to take over two existing suburban railway lines run by British Rail, one to Altrincham in the South and the other to Bury in the North, with a light rail scheme. These two lines were to be linked across the city centre with rail vehicles running at street level with an extension to Manchester Piccadilly Station. The two lines had between them an annual usage of 7.5 million passengers and received a subsidy of some £3m per year.

The selected system was for electric vehicles operating on 750V DC from overhead contact wires capable of 50km/hr in street running mode and 80km/hr on the segregated sections of the old British Rail Lines. All the vehicles would have full accessibility for people with disabilities and wheelchair access. In addition, all 18 stations on the old lines and the eight new stations in the city centre would have access for people with disabilities by level access, lifts or ramps.

In 1987 the Government indicated that the project would receive a public grant subject to private sector involvement. In September 1989 a contract to build and run phase one was awarded to the GMA group (consisting of GEC, Molem, Amec and GM Buses). They chose to use 26 articulated vehicles to be built in Firema, Italy. The construction costs of phase one were £135m. Construction was completed in 1991 and testing of the system began. The public service started in 1992 in four phases.

Phase two is the extension to Salford Quays and Eccles to the west of Manchester city centre. The contract to build and run phase two was awarded to Altram (a consortium of Serco Ltd, Ansaldo Trasporti, Laing Civil Engineering and 3i). As part of the contract they were to take over the running of the existing routes from 1997.

Environmental benefits

Metrolink, along with other electrically operated rail schemes, uses less energy per person compared to other road traffic with internal combustion engines. In a report conducted for GMPTE by ETSU Harwell³³ into energy use and emissions, the findings showed that Metrolink delivers a 60-70% energy saving compared to the bus and car. There is also a localised environmental benefit from the energy source with emissions located away from the city centre.

Table 3: Primary energy use and emissions per passenger kilometre.

mode	load factor	e n e r g y MJ/pkm	emissions g/pkm				
			CO ₂	CO	C	NOx	PM
Car	1.3	2.56	136	16.7 6	2.27	1.15	0.0 3
Bus*	7.8	2.51	165	2.57	0.79	2.30	0.2 5
Metrolink	30.1	0.98	56	0.01	<0.0 1	0.15	0.0 1

* this figure is based on the full range of buses used in Manchester (mini, midi, single and doubledecker). Bus figures can be improved by higher load factors.

These comparative energy efficiencies only deliver significant environmental benefit when people use the Metro instead of cars. Survey work has shown that this is the case. The use of the two British Rail lines prior to Metrolink was 7.5m passengers per year. The use of Metrolink reached 13.4m passengers in 1996, some 67% above those using the old rail services. Surveys carried out by GMPTE have shown that this passenger growth suggests in large part that Metrolink has been very successful in attracting people out of their cars and on to public transport.

The key findings of the GMPTE surveys are that:

- 65% of Metrolink passengers could have made their journey by car;
- car trips in the two Metrolink corridors have been reduced by 2.5 million;
- peak traffic on roads in those corridors has fallen by 6%, while increasing in other corridors;
- Metrolink has captured 25% of journeys from car travel in the areas it serves.

³³ ETSU, 1995, *Energy Use and Emissions from Passenger Transport Modes in Greater Manchester*, ETSU, Harwell.

It should also be noted that the Metrolink has brought considerable social benefits in terms of accessibility for people with disabilities and increased safety. These are also key components of sustainable development in the transport sector.

Job Creation

The building and operating of Metrolink has created a considerable number of jobs and job opportunities in Manchester and the surrounding area. These jobs have included those involved directly in construction, operation and maintenance, and indirectly in the local economy. In addition, jobs have been created in other parts of the UK manufacturing railway components, such as track and signal equipment, and in other parts of the European Union manufacturing the vehicles.

Table 4: Direct job creation by Metrolink ³⁴

Phase	Date	Jobs
Phase 1 construction	Jan 91 - July 92	1000
Phase 2 construction	98-99	600
Total		<i>1600 (2,400 job-years)</i>
Phase 1 operation and maintenance	1990	4
“	1992	160
“	1994	200
“	1996	220
Phase 2 operation and maintenance	1999	60
Total		<i>280</i>

A study carried out for GMPTE³⁵ found that there was insufficient evidence to put any figures on the numbers of indirect jobs created by phase one of Metrolink, other than that "there is plenty of anecdotal evidence to show that the economy of Manchester has benefited from the Metro Link". They suggest the reason for this is that the opening of phase one coincided with the 1992 recession.

The two corridors from Bury and Altrincham were mature corridors and there was little scope for new development on either route. However, passenger usage is some 67% higher than it was on the two rail routes. The same study also forecast the employment gains from the phase two extension to Salford Quay and Eccles. This included 388 temporary construction jobs on the link itself but a further 1,500 construction jobs from new developments attracted to Salford Quays. A further 1,140-1,285 jobs are likely to be created on the extension beyond Salford Quays to Eccles.

³⁴ Metrolink, Metrolink House Queens Road, Manchester, M8 0RY

³⁵ Roger Tym & Partners Ltd, *Greater Manchester Regeneration Benefits, GMPTE*, Manchester.

These jobs gains have far outweighed the small number of jobs that were lost on closure of the existing rail services. The people involved here were able to be absorbed into other jobs in the rest of the rail network or were of an age profile that they could take early retirement. There is no evidence to suggest that any jobs have been lost to the existing bus network that operates in Manchester and the surrounding areas. This is because the bus companies have changed their routes and introduced new routes as feeder services to Metrolink. It is likely that bus deregulation has had more effect on bus services and jobs in the bus industry in Manchester than the Metrolink.

South Yorkshire Supertram (Individual Case Study)

The South Yorkshire Supertram network was built during the 1990s with construction completed in 1997. It links Sheffield City Centre with Hillsborough to the North, Mosborough to the South and the Lower Don Valley to the East. No assessment of the environmental impact has been made, but, as noted in the previous case study, trams have significant advantages over road transport in terms of energy efficiency.

The scheme has created employment in three main ways:³⁶

- 260 jobs in direct employment on the scheme;
- 170 person years jobs in construction of the track;
- between 1000 and 2000 indirect jobs along the corridors that it serves.

Other light rail systems in the UK and their status

- Super Tram Sheffield in operation
- Docklands Light Rail London in operation, new extension proposed
- Newcastle Metro in operation, new extensions proposed
- West Midlands Light Rail under construction
- Tramlink Croydon under construction

National Cycle Network³⁷

³⁶ ECOTEC Research and Consulting, 1997, *Sustainable Development and Employment: A Challenge for Objective 2 Regions*, Report to DGXVI European Commission.

³⁷ Details of case study in: Jenkins, T, 1997, *Less Traffic More Jobs: The direct employment impacts of developing a sustainable transport system in the United Kingdom*, Friends of the Earth, London.

(Individual Case Study)

Investment in cycling infrastructures is needed following decades of transport planning that has squeezed out the bicycle. The National Cycle Network (NCN) now being developed by the environmental NGO Sustrans will provide the skeleton of an inter-urban cycle network.

Sustrans has used an analysis of job creation in previous cycle route construction to estimate that the NCN will generate 5,400 person-years of employment in construction and a further 600 person years in project management. Other employment benefits from the NCN include an estimated 500 person years in transport planning jobs, related to traffic calming, road crossings and the like, and 100 full-time path rangers. In total this is equivalent to 750 full-time jobs over a ten year period.

Extending safe cycling networks and increasing the numbers of people who cycle regularly will help to create jobs in cycle tourism, which has a low environmental impact and tends to generate revenue that is retained in the local economy. Sustrans analysis forecasts that the NCN will directly support 5,000 permanent jobs in tourist related activities.

Policy Proposals

There is now political consensus that transforming the transport sector requires urgent attention.³⁸ Environmental, economic and social factors have all played a part as the basis of a consensus that road traffic growth cannot continue at its present rate: it is unsustainable. There is also broad agreement on what needs to be done, including expanding the provision of public transport and encouraging people to use their cars less. As the earlier case studies demonstrate, reducing the dominance of cars as a mode of travel can create jobs.

Targets

The Government's CO₂ reduction target of 20% by 2010 provides a good framework within which policies can be developed. A national target for road traffic reduction would help frame transport policy in more detail. Friends of the Earth has suggested a target of 10% reduction in road traffic by 2010 over 1990 levels. Present responses to the demand for increased housing capacity threatens to increase road traffic growth by requiring travel from greenfield sites outside of towns and cities. The Government should set a target for the percentage of new housing provision that should be provided within urban areas in order to reduce this stimulus for greater traffic growth and to increase the potential for expanding

³⁸ Department of Transport, 1996, *Transport - the way forward: The Government's response to the transport debate*, HMSO, London; The Labour Party, 1996, *Consensus for Change: Labour's transport strategy for the 21st century*, Labour Party, London; The Liberal Democrats, 1995, *Transporting people, tackling pollution*, Liberal Democrat Publications, Dorchester.

public transport. Friends of the Earth has suggested a target of 75% of new build housing in urban areas.

Economic Instruments

The tax system provides strong signals which encourage or discourage certain activities and tends to entrench values. If the transport sector is to be transformed so that it is environmentally sustainable and provides employment for more people, the tax system needs to be reformed. We welcome the Government's commitment to such reform and believe that the tax reforms need to form part of a policy package that will create jobs and reduce environmental damage in the transport sector.

The package should include:

- continuation with the road fuel price escalator;
- removal of the perverse incentive for company car drivers to drive further to pay less tax;
- introduction of a tax on private non-residential parking to end the perk of free workplace parking, which makes up two thirds of town-centre parking, and encourages commuting by car.

The increases in road fuel duty and the taxation of company cars is a matter of national policy but we believe there is a strong case for implementing the workplace parking tax at the local level in order to achieve greater integration with other transport policies and to provide revenue for the investment in alternative modes of transport, such as public transport and cycling.

At the European level we believe that ending the complete tax 'holiday' enjoyed by air fuel would encourage greater investment in the rail network which would create employment and reduce the environmental impact of the transport sector.

Public Expenditure

In the transport sector there is a key role for Government investment to create jobs and to install an environmentally sustainable transport system. At a European and national level, large sums are already spent on the transport system but the balance of that spending between different modes of transport does not encourage the changes in investment patterns required. There is a need to shift the balance of spending toward investments that will encourage bus and cycle use in the first instance and over the medium term to increase rail transport.

Chronic under-investment in public transport and cycling provision in the UK, coupled with consistently high levels of public expenditure on the road network, created a highly uneven playing field between modes of passenger and freight transport. Correcting this will require public expenditure and substantial private investment. In the short-term much can be done to create jobs and develop a sustainable transport system, in particular by increasing investment in local level projects that aim to increase bus travel and cycling. For example only £85 million was available this year for traffic reduction schemes in England. Revenue

from the tax measures proposed above allow considerable scope to increase this amount. Local Government should be looking to increase these types of bids for funds.

When the Regional Development Agencies are set up and operating they should adopt policies that look to promote these changes in transport patterns as enthusiastically as development agencies have promoted road building in the past. If they do so they will help to create employment, protect the environment and reduce the traffic intensity of the regional economy.

Some transport infrastructure proposals such as light rail may be too expensive for an individual local authority, but will be realistic if undertaken at a regional level. In the UK, the proposed new Regional Development Agencies may be suitable vehicles for large transport projects.

Regulation

Over the past two decades rail and bus sectors have been privatised and largely deregulated. There is a strong case for strengthening regulation in both cases in order to ensure that these vital areas of the transport system attract investment and expand.

In the case of the rail industry the key question is whether there will be adequate levels of investment in rail infrastructure. One assessment commissioned by Railtrack suggested as much as £11 billion is needed to be spent on bridges, tunnels and sea defences. In addition there is a need to update the network through electrification and other technological advances in efficiency.

Yet with Railtrack unwilling to take the lead on new or speculative investment on projects such as new stations, further electrification and increased line capacity, there is no other single body available to co-ordinate new investment in the infrastructure. We therefore believe that the Regulator's role should be strengthened in this area.

In the case of the bus industry, regulation is required to co-ordinate the operations of individual bus companies and to create an efficient and comprehensive overall bus service. This is vital if bus travel is to gain new passengers who currently use cars. Establishing a strategic overview will not only require a review of how the market is regulated but point to institutional change as well. We support the Royal Commission on Environmental Pollution's call for more and stronger Passenger Transport Authorities.

7. WATER

There are few things as vital to people and the environment as water. Yet the water environment remains under constant threat from pollution and over-abstraction. Dealing effectively with these threats to increase water quality and eradicate water wastage can generate employment.

Water Quality

Despite recent improvements, 3650km (or 9 per cent) of our rivers and canals still have 'poor' or 'bad' water quality. Our river and groundwater are polluted by agricultural and industrial practices. The number of water pollution incidents in the UK increased every year from 1986, reaching 24,425 in 1994 (in England and Wales). Pollutants that are toxic and persistent can at present be legally emitted to water courses.

The cornerstone of an effective solution to this environmental degradation is a fundamental shift in industrial and agricultural practices. In the case of industry a shift transformation is needed away from the current ethos of pollution control to one of clean production and waste minimisation. This study does not cover the impacts of such a shift but it is reviewed elsewhere.³⁹ In the case of agriculture it requires a shift away from chemically intensive farming systems. The employment impacts of this change are dealt with in the agriculture section of this report.

In addition to these changes in the practices of polluters the water industry also needs to play a central role in building and maintaining the infrastructure that protects water quality. The UK has suffered from widespread under investment in this area. Redressing this would not only bring environmental benefits but would also create jobs despite the capital intensity of such projects. The European Urban Wastewater Treatment Directive has provided a stimulus to water companies to make such investments.

Figures for the employment gains from such projects are not common and will vary between projects of different types. However, Severn Trent Water have estimated that from an annual spend of £40 million per annum on direct environmental schemes, 23 full time staff are employed either directly or via contractors. South West Water note that indirect employment can be extended to include materials and equipment supplies and this means that for every water company job employed on an environmental infrastructure project, 10 more are employed outside the firm.

³⁹ Jenkins, T and McLaren, D, 1995, *Working Future? Jobs and the Environment*, Friends of the Earth, London.

During 1996/97 North West Water invested £275 million in the construction and upgrading of six wastewater treatment works and 190km of sewers in addition to £500 million in the 'Sea Change' programme designed to reduce pollution along the North West Coast. Using the Severn Trent employment to cost ratio these investment programmes employed approximately 160 and 280 people respectively.

Improving water quality also has an indirect impact on employment in some regions through improving the prospects for the tourism industry. In the South West, discharges of untreated waste water have damaged the environment and presented unacceptable risks to human health. Tourism is sensitive to both these negative impacts and in a region where approximately 80,000 people are employed in the sector investing in infrastructure to increase water quality helps to secure those jobs and increases the potential for more jobs in the future.

Finally, sewage treatment will lead to solid waste being produced. Some water companies are already examining ways of utilising this resource in ways that can be compatible with sustainability. Anglian Water, for example, have established a joint venture with Ipswich City Council to produce compost by combining sludge from the treatment works with composted green waste from parks and open spaces. In addition to protecting jobs the scheme has created two further full time posts. Clearly, if such schemes are successful and were replicated throughout the country, as composting of green waste becomes more common, the potential for employment is considerable.

Water wastage

Even though water is a renewable resource, the amounts we can use are limited. Although we have a lot of rain, we have a lot of people too. Recent water shortages in Yorkshire are perhaps the most striking example of the pressure on our water resources. But the impacts go far deeper. The environmental impacts of abstracting water are already significant. For example, English Nature surveys suggest that one in ten freshwater wetland Sites of Special Scientific Interest may be threatened by water abstraction. Climate change will make things worse. In light of this the level of water wastage through leakage and over-consumption in the UK is appalling.

OFWAT, the water industry regulator, has recently estimated that 30 per cent of water put into the distribution system leaks away. Reducing leakage rates requires detection and repair and employment is created by both these functions. North West Water currently employ 180 people in leak detection alone and are planning to expand these operations.

In addition, leakage demand side management offers an opportunity to bring environmental benefits and employment gains. As with the energy sector, increasing the efficiency of usage brings direct financial gain for the consumers and reduces or removes the need for building new supply infrastructure, which have environment impacts. Because increasing the efficiency is usually more labour-intensive than supply options, this creates jobs. In the UK the water industry has been slow to respond to the potential for investing in demand side management, but in Canada, where schemes are established, research shows that demand

side management investment generates 30% more employment than the equivalent investment in supply systems, such as new reservoir construction.

Land management

Finally many water companies own and manage large areas of land in rural areas. In the past environmental conservation and appropriate tourism have not been central to that management and there is considerable potential for this to improve. Some water companies are already moving in this direction and creating jobs at the same time. Severn Trent Water, for example, have initiated a land management survey programme which employs two ecologists and provides further employment by investing in stone walling, hedge-laying and reforestry schemes. The employment impacts of this type of scheme are dealt with in more detail in the agriculture section of the report.

Severn Trent have also developed the Carsington Reservoir for recreation, together with a conservation programme. Fifty full time jobs have been created in the visitor centre, countryside management, catering and sports management.

Policy proposals

Policy proposals to improve the water infrastructure, protect the environment and, simultaneously, create and safeguard employment can be enacted at the regional, national and European level. This will involve substantial expenditure, but many water companies, for example, are already investing heavily in a range of projects and there is scope for further development.

Investment is needed in measures to stop water leakage and to prevent over abstraction. The Government has set water companies specific water leakage reductions targets, but the companies should go beyond these if Britain's leakage rate is to be cut to the technically minimum possible. In the long run this would obviate the need to build reservoirs which are capital intensive and environmentally insensitive.

There is also scope for investment in land management which protects habitats and wildlife species, while enhancing the natural beauty of the environment. People too would benefit as land is opened up for recreational and study purposes. Government policy should set guidelines for use by walkers and school parties who have a particular interest in caring for the land.

The Government's Welfare to Work programme should encourage water companies to take on staff for specific environmental projects, but this should involve skill training which equip them for similar work in future. The utility green paper's proposal to strengthen the environmental objectives of companies should include clear guidelines to avoid any obfuscation of duties.

Finally, EU Directives, such as the Urban Waste Water Directive, need proper resourcing to be effective, but European initiatives in general should be clear and consistent, with best practice adopted across all Member States. European legislation should aim to protect the natural environment, protect human health and create the maximum number of jobs.

*Association for the Conservation of Energy
Friends of the Earth
GMB Research*

*U
NISON Research*