

Rural Businesses and Renewable Energy in Wear Valley and Teesdale

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1. Executive Summary

- 1.1 This research study forms part of a wider project to raise awareness of climate change and related issues within the business community of Teesdale and Wear Valley. It aims to assist business support providers in understanding how they might adapt future programmes of support to increase the level of interest in energy efficiency and the take up of renewable energy technologies. The project was funded by Natural England via West Durham Rural Pathfinder.
- 1.2 A raft of policy statements and targets has been issued by Government at all levels designed to reduce CO₂ emissions and encourage more energy to be generated from renewable sources. In translating policy into action a complex array of schemes and incentives have emerged many of which have a limited time span. In this regard there would appear to be more clarity for the land-based industries than other sectors.
- 1.3 Aside from climate change, in the North East region the Regional Economic Strategy identifies 'Energy and the Environment' as a key sector offering significant opportunities for business and employment growth.
- 1.4 In order to provide some insights into current attitudes of the business community towards renewable energy a survey was conducted with a range of businesses within the study area. The results need to be treated with some caution because of the small sample and the way in which the participating businesses were selected. The survey findings are presented in Section 7 of the report. The businesses have been classified into those that have already adopted renewable energy, those that are interested (but may or may not take any further action) and those that are not interested. A separate commentary is also provided on the land-based businesses because of the particular opportunities that exist within this sector.
- 1.5 The study presents some conclusions in relation to the future role and activities of business support providers in this field. The research reveals that financial issues represent the main barrier to greater investment in renewable energy infrastructure. Those businesses that have seriously explored the options have used a variety of sources of information. The value attached to trusted and impartial advice has been underlined together with the existence of exemplar projects in the locality. Grant aid to carry out feasibility studies would also be helpful. A specific window of opportunity for investment in renewable energy has been identified when businesses relocate or are intending to replace or upgrade infrastructure. The importance of business advisers being up to date with developments and research work in this fast moving field is also highlighted.

2. Introduction

- 2.1 This study has been sponsored by the Enterprise Agency for Teesdale and Wear Valley, hereafter referred to as the Enterprise Agency. Funding was provided by Natural England via West Durham Rural Pathfinder (WDRP). The study forms part of a wider project to raise awareness of climate change and related issues within the business community of this area and to assist business support providers in developing a programme of business support activities designed to increase the take up of renewable energy technologies. The study involved a survey of businesses (including farms) to identify barriers to the use of renewable energy technology and to shed some light on current perceptions about the economic opportunities which might arise from more widespread use of renewable energy by households and businesses.
- 2.2 The principal technologies falling within the scope of this study are those that can be practically adopted by small and medium enterprises (SMEs) and micro-businesses, and typically include relatively small scale installations that generate energy from wind, biomass, solar, ground source heat and the conversion of waste.
- 2.3 The research was supervised by staff at the Centre for Rural Economy, School of Agriculture, Food and Rural Development, Newcastle University during August 2007.

3. The study area: local context

- 3.1 The study area encompasses the local authority districts of Teesdale and Wear Valley, and includes medium-sized towns (e.g. Bishop Auckland), smaller towns (e.g. Barnard Castle) and villages. The west of the area comprises extensive sparsely-populated upland areas.
- 3.2 Some relevant features of the study area for this project are:
- The topography, land uses and natural resources (exposed uplands, major water catchments, arable as well as livestock production systems, extensive forests and woodlands, etc) are favourable to the utilisation of a wide range of renewable energy technologies.
 - There is a major development, a large biomass-fuelled power station, opening soon at the Wilton10 site on Teesside. This will potentially provide a market for wood (as logs, chips, and specially grown energy crops). Adjacent to the site, UK Wood Recycling Ltd recently opened a large wood recycling unit which produces wood chip from recycled wood for the power station.
 - The yield potential for short rotation coppice (SRC) is high in the eastern section, centred around Bishop Auckland, but low in the west.¹ Nevertheless, take-up under the Energy Crops Scheme (for both SRC and crops such as miscanthus) has been minimal in the North East region as a whole.

¹ Defra (2007) *Energy Crops, Short Rotation Coppice North East*. Available from: http://www.defra.gov.uk/farm/crops/industrial/energy/opportunities/pdf/yield/src/ne_src_yield_250.pdf. Accessed 11th September 2007.

- Mains utility supply is constrained in some areas. Many of the area's smaller settlements have no mains gas supply and some more remote properties do not have mains electricity either. Some industrial premises, although supplied with mains electricity, do not possess a 3-phase supply.
- At the Blue Circle/Lafarge cement works site at Eastgate in Upper Weardale there are advanced plans, masterminded by a Task Group, to create a major renewable energy village providing new homes, business premises and tourism facilities. If these plans come to fruition a strong cluster of renewable energy based companies will be formed, opening up considerable opportunities in the supply chain. On a smaller scale, two Durham communities (Middleton in Teesdale and Edmondsley) are actively working on projects to reduce the carbon footprint of their villages.

4. The national and regional policy context

4.1 The Government's Energy White Paper (EWP) published in 2003² set out four main goals:

- To put the UK on a path to cut CO₂ emissions (the main contributor to global warming) by some 60% by about 2050, with real progress by 2020;
- To maintain the reliability of energy supplies;
- To promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity;
- To ensure that every home is adequately and affordably heated.

4.2 Prior to the publication of the EWP, the Energy Review prepared by the Cabinet Office Performance and Innovation Unit recommended that regional planning bodies give greater prominence to energy issues in regional planning guidance. The EWP placed particular emphasis on the role of regional and sub-regional organisations in helping to meet the stated targets.

4.3 In May 2007 the Government published a further White Paper on Energy³ reaffirming these four goals but acknowledging the evolving contextual situation. Several factors contribute to this evolving situation, including: growing evidence of the impact of climate change; rising fossil fuel prices and the slower than expected liberalisation of EU energy markets; heightened awareness of the risks of oil and gas supplies being concentrated in unstable regions (such as Russia and Central Asia, the Middle East and North Africa); and the need for investment in power stations, the electricity grid and gas infrastructure in the UK. To date, environmental and climate change policy and regulatory standards in the UK have tended to be focused primarily on large corporations rather than small businesses. This is despite the fact that small businesses account for over 90% of UK firms and, although their individual environmental impact may be small, collectively their impact is likely to be

² Department for Trade and Industry (2003) *Energy White Paper: Our energy future – creating a low carbon economy*, The Stationery Office, CM5761 (February).

³ Department for Trade and Industry (2007) *Meeting the Energy Challenge: A White Paper on Energy*, The Stationery Office, CM7124 (May).

significant⁴. Addressing climate change is currently a high priority for the Department of the Environment, Food and Rural Affairs (Defra), with policies and priorities for action set out in the UK Climate Change Programme published in 2006.

- 4.4 The Department for Business, Enterprise and Regulatory Reform is responsible for the delivery of the EWP in the UK (this was formerly the responsibility of the Department for Trade and Industry). At a regional level, the responsibility lies with Government Offices, in partnership with regional agencies, sub-regional partnerships, local authorities, the voluntary sector, industry and rural communities. In the North East, the North East Energy Partnership (NEEP) takes the lead on developing and overseeing regional energy issues, although its structure is currently under review. The NEEP is informed by regional stakeholders and organisations through the North East Energy Forum and it delivers actions through its themed groups and subgroups. Energy North East (ENE) is the brand name for energy activities in the North East covering all organisations and activities that are involved in or have an interest in energy issues affecting the North East.
- 4.5 In 1999, The Northern Energy Initiative (TNEI – a regionally based sustainable energy consultancy) produced “*Energy for a new century: An energy strategy for the North East*”⁵. This strategy analysed the energy situation in the North East and set out a series of targets for 2010 - including for renewable energy capacity and power generation - and actions to meet those targets. However, some momentum was lost after the publication of the strategy⁶ and in 2004, GONE produced a “*Regional Energy Activity Scoping Study*” which reviewed progress in the North East with respect to the objectives and goals of the 2003 EWP.
- 4.6 TNEI was also responsible for co-ordinating a number of bodies to produce a *North East Regional Renewable Energy Strategy (RRES)* in 2003 (subsequently updated in 2005⁷) which also fed into the Regional Spatial Strategy (RSS) policy on renewable energy. The 2005 report by TNEI notes that the increasing price of energy is likely to be the factor most likely to affect electricity consumption in future and may provide a powerful incentive towards achieving greater efficiency and the Government’s broader objectives in future. The report notes that installers of small scale renewables - solar hot water, ground sourced heat, photovoltaics and micro wind - all report significantly increased activity and rates of installation during the year to September 2005. Moreover, the RRES notes that the North East region is about to undergo a period of unprecedented investment and growth in renewable energy use and by 2020, 20% of the North East’s energy requirements could be met by clean, secure, locally based renewable technologies. One limiting factor, however, may be the capacity of the National Grid to absorb new renewables in the region. Businesses need to be aware of the benefits and opportunities provided through the use of renewable energies, and they need to balance the relatively

⁴ Hillary, R. (2000) *Small and Medium Sized Enterprises and the Environment: Business Imperatives*, Sheffield: Greenleaf Publishing.

⁵ The Northern Energy Initiative (1999) *Energy for a new century: An energy strategy for the North East*, The Northern Energy Initiative.

⁶ Government Office for the North East (GONE) (2004) *Regional Energy Activity Scoping Study, Final Report*, Government Office for the North East (July).

⁷ The Northern Energy Initiative (TNEI) (2005) *North East Regional Renewable Energy Strategy, Review September 2005*, TNEI Services Limited, Newcastle.

high installation costs of these technologies against their running costs. However, greater awareness of the contributory effects of energy use on climate change and a desire for a degree of energy independence may encourage the greater use of small wind turbines and other technologies by individual households and small businesses⁸.

- 4.7 The North East RSS (currently still in draft stage) provides a strong, soundly-based plan led approach to the development of renewables. The RSS policy framework provides regional and sub-regional minimum renewable electricity targets for 2010 and 2020, sets out criteria for assessing renewable energy proposals (recognising the wider environmental, economic and social benefits arising from higher levels of renewable energy) and gives a strategic steer towards broad areas considered appropriate for particular technologies⁹.
- 4.8 The region's RDA, One NorthEast (ONE) is responsible for preparing the Regional Economic Strategy and Action Plan which was completed in 2006. One of the three key areas of industrial opportunity (the three pillars) which has been identified for the NE is 'Energy and the Environment'. ONE takes a lead role in co-ordinating activities contributing to the Government's Framework for Sustainable Consumption and Production. ONE also co-ordinates the regional delivery of national programmes funded through the Business Resource Efficiency and Waste (BREW) Programme, including Envirowise, the Waste and Resources Action Programme (WRAP), the National Industries Symbiosis Programme (NISP) and the Carbon Trust. In addition, the Carbon Trust has a North East Regional Manager to provide advice to companies on improved energy efficiency measures under the Action Energy Programme.
- 4.9 Placing the North East region in the context of other English regions, it has the lowest economic wealth of all regions in the UK, yet in 2002 it was the third highest consumer of energy per capita of the English regions, reflecting the importance of the region's manufacturing sector¹⁰. As regional GVA increases it is likely that electricity consumption in the industrial and commercial sectors will also grow, albeit at slower rates as the link between GVA growth and energy use is not as strong as it has been in the past. This is partly due to increased efficiency and also because the service sector, where most growth is taking place, is less energy intensive than manufacturing industry. Nevertheless, the North East region has a difficult balancing act to play in terms of achieving economic growth without increasing the region's energy consumption and hence CO₂ emissions.

5. Policy into action: public funded advice and incentives for business

- 5.1 A number of funding streams which provide support to businesses in relation to renewable energy have developed from the policies described in Section 4. They include both national schemes and those administered regionally and locally.

⁸ The Northern Energy Initiative (TNEI) (2005) *North East Regional Renewable Energy Strategy, Review September 2005*, TNEI Services Limited, Newcastle.

⁹ Ibid.

¹⁰ Government Office for the North East (GONE) (2004) *Regional Energy Activity Scoping Study, Final Report*, Government Office for the North East (July).

National schemes

- 5.2 Energy-Efficiency Loans from the Carbon Trust: Interest-free loans are available to SMEs to support projects which reduce carbon emissions, including the adoption of renewable energy generating equipment. To be eligible, SMEs must have been trading for at least 12 months, but not in the farming, transport or exporting sectors. Furthermore the expected payback period of the project should be less than 5 years. The size of loan is dependent on the projected level of energy savings, and can be from £5,000 to £100,000.
- 5.3 Bio-energy Capital Grants Scheme: This scheme, run by Defra, supports the installation of biomass-fuelled heat and combined heat and power projects in the industrial, commercial and community sectors. The latest round was closed to applications in March 2007, and as yet there is no firm commitment to a future round. The scheme provides capital grants of up to 40% of the difference in cost compared to installing a fossil fuel alternative, and individual awards are between £25,000 and £1million. Higher awards were possible for multiple or bundled applications. These figures suggest the scheme is directed at medium to large projects since, to receive the minimum grant, the difference between the renewable scheme and its conventional alternative must be at least £62,200.
- 5.4 Bio-energy Infrastructure Scheme: This scheme, also run by Defra, provides grants to farmers, foresters and businesses to help develop the supply chain for energy crops and wood fuel. The delayed second round of this scheme is likely to be launched in Autumn 2007. Of most interest in West Durham are the provisions relating to wood fuel, which include grants (to businesses or producer groups) of up to 40% for capital equipment used for harvesting, processing, quality assurance, etc. and grants to help set up producer groups.
- 5.5 Low Carbon Buildings Programme: This programme is run by the sustainable energy consultants BRE on behalf of the Department for Business, Enterprise and Regulatory Reform. Stream 2 of the programme is expected to run until 2009. Grants towards capital costs are awarded by a competitive process to projects that offer 'holistic delivery of low carbon buildings'. The standards demanded of successful projects are apparently very high. Stream 2A provides grants of up to £100,000, whereas the maximum for Stream 2B projects is £1 million. For large businesses, grants may be up to 40% of installation costs; SMEs can be awarded up to 50%.
- 5.6 Free energy surveys: The Carbon Trust provides free on-site surveys to assess energy saving opportunities in firms with a minimum annual energy spend of £50,000. Self-help information is available for other firms.
- 5.7 Enhanced Capital Allowance Scheme: This scheme, administered by the Carbon Trust, is open to all businesses which pay UK income tax or corporation tax. It allows the full cost of investment in energy saving equipment to be written off against taxable profits in the same tax year as the purchase is made.
- 5.8 The Energy Crops Scheme: From 1st October 2007, farmers are able to apply for the new Energy Crops Scheme (ECS) although no grants will be offered until the new Rural Development Programme for England 2007-2013 (RDPE) is approved by the European Commission. The scheme was opened for applications to enable growers to begin the appraisal process (which can take

three months) and to plan for spring planting. The ECS provides funding for growers to establish miscanthus and short rotation coppice (SRC) of willow and other native or naturalised species to produce renewable energy. The ECS will be delivered by Natural England, and establishment grants are currently proposed at £1,000 per hectare for SRC and £800 per hectare for miscanthus (although the rates will only be finalised when the RDPE is approved).

Regionally administered schemes

5.9 Midas: The Midas programme, operational from March 2006 to April 2008, helps businesses improve competitiveness by managing their resources (energy, water, waste) more efficiently. Midas is operated by TNEI Services Ltd. and is financed by ONE from funds allocated from Defra's BREW programme. Support is available to all businesses in the North East, and a variety of renewable energy technologies fall within the expertise of Midas and its contracted consultants. Among its activities are:

- Free diagnostic assessment, including feasibility for renewable energy.
- Up to 10 days consultancy with 60% funding to advance the project up to submitting a planning application and site preparation. Clients are provided (where possible) with a choice of three providers. Where there is more than one project, a further 10 days of subsidised consultancy is available for each.
- An aftercare service to help project implementation.

5.10 Northwoods: Northwoods is a partnership of 13 public and private sector organisations (including local authorities, Business Link, ONE, and the Forestry Commission) from which it receives core funding. The Northwoods project is managed by Rural Development Initiatives, a not for profit management company. The aim is to support woodland and forestry businesses in the North East region and in particular to stimulate wood fuel supply and demand. Its activities include:

- Training in technical, management and business skills, to enable producers to set up and run a wood fuel business;
- Providing information and advice, for example in relation to grants and legislation. Northwoods has conducted research projects in the region to assess market conditions and skills;
- *North East Wood Fuels (NEWFuels)* which was established to set up wood fuel producer groups and promote confidence in the supply chain. Funding was achieved by a successful bid to Defra's Bio-energy Infrastructure Scheme in 2005. Currently there are approximately 25 producers involved who are mostly forestry contractors;
- *NEWHeat* is a market acceleration project which was launched in April 2007 after being awarded a £1.2 million contract by ONE funded from its Single Programme budget. It will run until March 2009. NEWHeat aims to promote and support wood fuel use by the private sector and charities. For no cost it conducts a site assessment and assesses the business suitability for wood fuel systems. If the client decides to proceed further, installers are invited to submit a budget cost estimate. A chosen installer, with 80% funding, then produces a detailed design and quotation, taking the project up to the point of installation.

- 5.11 Energy Resource Efficiency (ERE): This ONE-funded project started in February 2007 under the umbrella of NEPA (North East Productivity Alliance) to help improve the productivity of the regional manufacturing sector through dissemination of best practice. ERE activities are aimed at helping firms reduce their energy costs and carbon footprint. ERE achieves its objectives by increasing staff awareness and imparting knowledge and skills which become embedded in the firm. Such training can help firms assess the feasibility of adopting renewable energy technology and to implement projects. ERE provides consultants on a benefits-in-kind basis, with no direct financial cost to the firm.

Locally administered schemes

- 5.12 North Pennines AONB, Sustainable Development Fund: Small grants are available to businesses, community groups and individuals for projects which bring environmental, economic and social benefits to the AONB. Grants have been awarded for both consultancy and capital costs of small scale renewable energy projects, often in combination with other funding streams. The application process is competitive and starts in the autumn. Funded by Defra, the total amount available to the AONB has diminished during the three years since the funding started. The maximum grant is £30,000.
- 5.13 Rural Business and the Environment: This new project has been created by the Enterprise Agency for businesses in Teesdale and Wear Valley interested in energy efficiency, cost savings, alternative and renewable energy sources, reducing their carbon footprint and helping to create practical incentive schemes to support eco-investment. The Enterprise Agency will be running workshops and training courses, offering advice and useful information, toolkits for self auditing and practical ways of saving money.

6. Insights from practitioners

- 6.1 To gain an insight into the issues encountered in practice by operators of renewable energy technology and specialists who work in the field, information was sought, by telephone conversation, from a variety of experienced individuals. The main findings were:

- Although some forms of renewable energy employ very old technologies, the recent adopters have often been pioneers, having shown a high degree of management skill and technological knowledge, as well as commitment and determination to overcome many obstacles.
- The situation is evolving such that some of the barriers faced by the early adopters are of less significance now. For example, issues relating to planning consent are now better understood by all parties. Generally, fewer problems are now encountered in obtaining planning permission for small wind turbines.
- A high level of technical knowledge is required to correctly specify the renewable energy technology which is most appropriate for a site.
- In practice, with the exception of the wood fuel sector, the sources of capital grant aid to business are almost non-existent. For example, the

Low Carbon Buildings scheme is over-subscribed, the application process is very demanding, and minimal numbers of firms in the region have been successful with this or its predecessor.

- The Energy for Enterprise scheme ran from 2003 to 2006 and provided support to SMEs in the Objective 2 areas of the North East region. It followed on from the Electricity for Enterprise scheme which operated in the Northumberland Objective 5b area only. These schemes were considered to have been useful, providing a one-stop shop for advice, subsidised consultancy and capital grants, and had assisted many microbusinesses.
- These business schemes were paralleled by the Countryside Agency's Community Renewables Initiative which was implemented in the North East region as the REALL (Renewable Energy at a Local Level) project, and ran from 2004 to March 2007. This was thought to offer considerable potential as a one-stop shop for advice and capital grants in applying renewable energy technologies to rural community facilities. Although a large number of enquiries were registered, relatively few projects progressed through to the stages of formal feasibility study and installation.
- Forestry organisations cite changes in the market for forestry products such that small roundwood and thinnings, which formerly had little value, may be worth harvesting. There is an emerging market, they report, for wood fuel. An untapped reservoir of such material exists both regionally and nationally resulting from the under-management of woodland in recent decades. The Wilton10 development is expected to source large quantities of material from Forestry Commission estates but is unlikely to be attractive to smaller scale private woodland owners. Self-supply, or supply to local boilers, would appear to be better options for such owners.
- Adoption of renewable energy technology is inspired in some cases by environmental consciousness. This can also help present a green image. However uncertainty was expressed over how helpful differentiating and marketing a business based on its 'greenness' is in attracting clients.
- There is a shortage of appropriately trained and experienced engineering consultants with specialised knowledge of the renewable energy sector in the region.
- Newcastle University is currently working on a major project to create a Centre for Renewable Energy from Land (CREEL) at its Cockle Park farm located near Morpeth in Northumberland. If this development proceeds the Centre will be able to demonstrate and provide training and advice across a range of renewable energy technologies with the emphasis on the land-based sectors and rural areas (energy crops, anaerobic digestion, woodfuel, ground source heat, photovoltaics and small wind turbines). The Centre will also provide office and workshop facilities for small companies specialising in the renewable energy sector.

- The North East Rural Affairs Forum is conscious of a lack of information on projects which demonstrate the practical application of renewable energy technologies by rural businesses. A list of projects is presently being compiled which in due course is intended to help those seeking further information on the subject. One initiative which is especially noteworthy is the Tynedale Renewable Energy Trail. This comprises 16 sites and business premises in the Tynedale District where a range of technologies can be observed and for many of these sites interpretation panels have been installed. A website (www.tynedalerenewableenergy.org.uk) provides a profile of each site and a map and directions, as well as additional information on equipment suppliers and sources of advice and grant aid.

7. Business survey

7.1 The business survey was designed and structured in such a way as to provide insights into the actions and opinions regarding renewable energy of individual firms within the study area. Based on a desk-based review of recent literature (for example: Hillary 2000; Revell and Rutherford 2003; Revell and Blackburn 2004; Stokes *et al.* 2007)¹¹, the interviews conducted for the study addressed the following broad questions:

- Users of renewable energy generating technology
What was the motivation for starting to use renewable energy?
What barriers were faced during the process of adoption, and how were they overcome?
What sources of advice and information have adopters used?
- Non-users of renewable energy
What level of interest do firms have in adopting renewable energy?
What has stimulated their interest?
What advice and information have been sought, and from which sources?
What deters those with an interest in renewable energy technology from adopting it?
- Both users and non-users
What (further) supply chain opportunities exist for the firm in the event of increasing demand for renewable energy technology by businesses and households?

¹¹ Hillary, R. (2000) *Small and Medium Sized Enterprises and the Environment: Business Imperatives*, Sheffield: Greenleaf Publishing; Revell, A. and Rutherford, R. (2003) UK Environmental Policy and the Small Firm: Broadening the Focus, *Business Strategy and the Environment* 12 pp. 26-35; Revell, A. and Blackburn, R. (2004) *UK SMEs and their Response to Environmental Issues, Executive Summary*, Small Business Research Centre Kingston University SBRC 03. Available at <http://www.psi.org.uk/ehb/projectsblackburn.html>, Accessed 12th July 2007; Stokes, D., Chen, H. and Revell, A. (2007) *Small businesses and the environment: turning over a new leaf?*, A Report for the Workspace Group PLC (March).

Sampling and conduct of survey

- 7.2 To gain the maximum amount of information from the limited survey resources available for deployment, the study employed a purposive sample. A purposive sample is chosen subjectively by the researcher by firstly specifying criteria for inclusion in the study, and then identifying elements (firms) thought to meet them. This study aimed to capture firms with the following characteristics: in independent ownership; located in the study area of Teesdale and Wear Valley local authority districts; avoiding industrial sectors with apparently few opportunities to exploit renewable energy generation; and to be either adopters of renewable energy generation, or known to display entrepreneurial behaviour, or with a known interest in renewable energy. By targeting entrepreneurial firms and those with an interest, it was hoped to maximise the proportion of interviews yielding useful qualitative data. Such firms, it was postulated, would be the most likely to have formed an opinion on the adoption of renewable energy technology and the difficulties it might present.
- 7.3 Using its expert knowledge to identify firms displaying these characteristics, the survey sampling frame was compiled by the Enterprise Agency, drawing on its database of businesses, and other firms known about through direct contact or networks. A particular effort was made to include firms which, it was believed, would have a substantial proportion of their costs attributable to energy consumption, such as manufacturing and hospitality businesses.
- 7.4 Because this is a non-probability sampling method, it is not possible to generalise the findings and attribute these to the population of businesses as a whole. However, the data from the survey can be used to generate valuable insights.
- 7.5 The business interviews were conducted with senior staff with responsibility for, or detailed knowledge of, strategic decision-making in the firm. In most cases this was the owner-operator. Approximately one quarter of the interviews were conducted face-to-face, and the remainder were conducted by telephone.
- 7.6 Because of the distinct opportunities which exist for land-based businesses (farming and forestry) a different questionnaire was devised compared to that used for all other sectors. However, because the research questions are the same for both groups, similar types of information were sought by both questionnaires. In addition, classification information such as sector, location and business size (indicated by number of employees) was recorded.
- 7.7 To facilitate consistency between interviewers, interviews followed a structured format and avoided questions likely to produce long discursive answers. Instead both questionnaires consisted of closed questions, and short, open answer questions.

Sample overview

- 7.8 In all, 39 usable interviews were completed. Tables 7.1 to 7.3 show the distribution of firms by sector and size (number of employees, including the operator) and their level of interest in renewable energy.

Table 7.1: Sample firms by Standard Industrial Classification (SIC 2003)

Division of SIC	Description	Examples*	Sample firms
A,B	Agriculture, hunting, forestry, fishing		8
D	Manufacturing		15
F	Construction	Builders, plumbers	6
G	Retail, wholesale, repairs		5
H	Hotels and restaurants	Hospitality sector, including rented holiday accommodation, pubs	3
K	Real estate, renting & business activities	Computer consultancy, solicitor, services to businesses	1
0	Other community, social and personal services	Crafts, artists, sport, hairdressing	1
TOTAL			39

Source of industrial classification: SIC 2003

<http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14012>

* For illustrative purposes, and not necessarily in the sample

Table 7.2 Full time employees (including owner-operators) in non land-based businesses

Business size	Number of employed persons	Firms
micro	1 to 4	10
	5 to 9	3
small	10 to 49	13
medium	50 to 249	3
Large	>249	2
TOTAL		31

Table 7.3: Adoption of renewable energy technology

Interest in renewable energy		Land-based firms	Other firms	Total
Already adopted (Adopters)		3	1	4
Interested (Non-adopters)	Very likely to proceed	0	1	1
	May proceed	3	6	9
	Won't proceed	2	9	11
Not interested (Non-adopters)		0	14	14
TOTAL		8	31	39

- 7.9 The scope of activities captured in the sample is wider than might be suggested by the high level classification used in Table 7.1. For example, it includes construction firms with retail or consultancy activities, manufacturers of building-related products who also perform installations, and farms with tourism enterprises. The land-based businesses consist of four farms outside the Severely Disadvantaged Area, and three farms and one forestry estate within it.
- 7.10 The sample is dominated by manufacturing firms. This has probably arisen from the targeting of firms anticipated to have relatively large energy requirements and their greater accessibility for interview administration (some interviews were conducted by Enterprise Agency staff at scheduled review meetings).
- 7.11 A large majority of firms (including land-based) owned their own premises (with or without a mortgage). Of the non land-based firms, 10 reported that their energy costs (excluding vehicles) were very significant in the finances of the business, whereas seven reported that they were insignificant. Only one interviewee did not have mains electricity and few firms did not have access to mains gas. Two firms commented that a 3-phase mains supply was necessary but not available, so they had purchased supplementary generators.
- 7.12 An energy efficiency audit is an important first step in reducing energy consumption. Non-farms were asked if they'd had, or would be interested in having, such an audit. Eight firms had undertaken an audit and 14 firms said they would be interested in having one. Eight more were not interested in having an audit, in three cases because they were in new energy-efficient buildings and/or had efficient new machinery.

Survey findings

- 7.13 To describe the survey findings, respondents are divided into three main groups: 'Adopters' (users) of renewable energy generating technology; non-adopters who report an interest in the technology ('Interested non-adopters'), and non-adopters with no interest in it at present ('Not interested non-adopters'). As shown in Table 7.3, interested non-adopters can be further subdivided by their reported future intentions. For each of the main groupings the survey responses relating to motivation, barriers to renewable energy adoption and sources of advice and information used are summarised.

ADOPTERS

- 7.14 The four Adopters consist of two farms, a forestry business, and one non-farm business whose home-based premises includes a small area of farmland. All four are owner-occupiers and therefore, unlike tenants, have autonomy over capital projects involving buildings. Their renewable energy projects became operational between one and six years ago and comprise: a wind farm; an on-farm biomass (wood) boiler providing district heating and hot water to adjacent holiday accommodation; a biomass boiler supplying heating and water to large domestic premises; and a combined project (for own-consumption only) consisting of a wind turbine, photovoltaic panels and a wood-burning range.
- 7.15 All four are strongly committed to adopting renewable energy technology as an integral part of their business activities, with two explicitly mentioning their wish to behave in an environmentally-conscious way. The on-farm wood boiler

project resulted from business restructuring following the devastating effect of foot and mouth disease in 2001. The wind farm generates an extra income stream by selling electricity to the National Grid. For the remaining two Adopters, business and domestic objectives are strongly integrated. For the biomass boiler project, woodfuel is harvested from woodland within the same ownership, and the fourth respondent, already strongly committed to sustainable living, was enabled to run a business from home despite the lack of mains gas and electricity.

- 7.16 For all four the decision to proceed was ultimately determined by financial considerations. Three had compared the costs of adopting renewable energy generation with the alternatives, in one case the cost of connection to the mains supply, and in the other two the purchase of oil-fired heating. The wind farm diversifies the existing farm enterprise and is compatible with agricultural production.
- 7.17 Three Adopters reported that, although pleased with the final outcome, it had been a long drawn out process to reach it. Obtaining planning permission had taken a long time for the two respondents with wind turbines and photovoltaic panels. In particular, significant objections were raised by the public to the wind farm. The delays were felt to be partly due to the lack of precedents and it is interesting to speculate now whether this situation has improved through planning authorities gaining greater experience, clearer planning guidance, and the ability of consultants to submit better plans.
- 7.18 Two firms had applied for grants and found the system extremely difficult to navigate even though a considerable amount of practical help with both identifying grants and filling in application forms was received from public sector business support organisations. The grants had been helpful, although without them the projects would probably have still gone ahead, though on a smaller scale. It is believed that the grants obtained no longer exist and there is a perception that no successor sources of capital grant aid for small businesses now exist. Another issue highlighted was the need for timeliness in awarding grant aid. For example this could make the difference between being ready for the tourist season and missing it altogether.
- 7.19 To obtain the necessary information, the Adopters had followed several different paths. The landowner with the wind farm project did not require detailed technical knowledge as the project was handed over to a regional specialist energy company who dealt with, *inter alia*, the technical specification, planning application and installation. However, it was necessary for him to negotiate a good deal for himself, for which there were too few facts and figures available. One of the interviewees with a biomass boiler had been inspired by a trade stall at an agricultural show after which a visit to a demonstration site was arranged. Important decisions, such as specification and design, were made in conjunction with the boiler supplier, who was based in Scotland. Advice and recommendations for the other biomass boiler had been obtained from consultants beyond the region. The fourth firm had detailed technical knowledge (including a relevant degree) and spent a long time conducting their own investigations. Nevertheless, they took important decisions on the basis of advice (including costings, appropriate technical specifications, and possible sources of grant aid) from a local installation firm, staffed by highly experienced and qualified engineers. This firm reported that knowing someone else with a renewable energy generation project had helped inspire their interest.

- 7.20 Two of the land-based Adopters discussed above have identified possible additional projects.

INTERESTED NON-ADOPTERS – LAND-BASED BUSINESSES

- 7.21 Compared to other sectors, land-based businesses have more opportunities available to them to exploit renewable energy. These arise from the capacity to produce feedstock such as waste organic material, cereals, oilseeds and wood, and the availability of land to accommodate space-consuming technology such as ground source heat pumps and wind turbines. Furthermore a variety of applications exist to utilise the energy generated including domestic or holiday accommodation, and agricultural or diversified business activities undertaken in outbuildings. For these reasons, land-based firms are considered separately from other non-adopting firms.
- 7.22 The five Non-adopter interviewees in the land-based sector were all owner-occupiers and therefore free of the constraints of tenancy agreements. All five had identified specific renewable energy projects. Most commonly the elevation of the land and its windiness, they believed, made it suitable for wind turbines. Other suggestions include hydro-electric (utilising a redundant water mill), solar panels and harnessing farm wastes to produce energy. Awareness of renewable energy came about from knowledge of existing projects, the farming press (including advertisements), and a recent local meeting organised by the Enterprise Agency which two had attended.
- 7.23 For these five respondents these projects must be viewed as aspirational having, as yet, conducted no investigation to assess either their technical or financial feasibility. One interviewee was unlikely to take it forward in the near future having just expanded their business by means of a capital project, and having already invested in a diesel generator to provide a 3-phase supply. Another respondent had, in the past, had a planning application for wind generation turned down amid much local acrimony, and it had been a lengthy and unpleasant experience. For another, the installation of solar panels at a new-build was found not to be financially viable, based on the advice of an architect.
- 7.24 The information needed to take the project forward was anticipated to be: advice on the likelihood of obtaining planning permission for the particular site (one respondent); information concerning financial feasibility and grants (two respondents); technical advice on the feasibility and optimal technology for the site (four respondents); and clear information about whether they could supply any electricity generated from wind turbines to the National Grid (three respondents). (There were multiple responses for some respondents.)
- 7.25 Various sources of information which might prove especially useful were suggested. One wanted an experienced person to visit the site to assess its suitability; another would like to speak to a landowner who had a similar project in operation; another suggested a respectable private contractor. Two weren't sure, partly because they hadn't given the matter much thought as yet, but also due to one having a fairly poor view of public support agencies, and finding consultants generally too dear.

Woodfuel and biomass crops (all land-based firms)

- 7.26 All eight land-based firms were asked about their engagement with producing woodfuel or other biomass crops. Woodfuel could be an important by-product of woodland managed for other purposes (e.g. timber, game management), whilst SRC (generally considered as an alternative use for arable land) is specifically planted for that purpose. Short rotation forestry, when immature trees are clear felled for woodfuel purposes, is not an established technique in this country yet.
- 7.27 Three interviewees had appreciable amounts of woodland, one of which, as indicated in para 7.15, is already using this to supply a boiler. The other two however were not interested in using the by-products for woodfuel, either for self-supply or sale. For one, the crop is being managed for amenity purposes and is, in any case, very immature. For the other the capital investment required to utilise it (e.g. boiler and district heating) did not make self-supply feasible. One commented that minimal revenue was obtainable because the roadside price for such material was so low.
- 7.28 Among the remaining land-based firms there was little enthusiasm for planting trees. For some this reflects the poor upland conditions for growing trees. Others simply weren't interested, being fully occupied with other activities.
- 7.29 Biomass crops grown on arable land, such as oilseeds, cereals and SRC, can in certain circumstances attract set-aside payments. However, for six of the land-based sample their cultivation would not be feasible because of the unsuitability of the upland location and/or lack of suitable cropping land.

INTERESTED NON-ADOPTERS – OTHER SECTORS

- 7.30 There were 16 Interested Non-adopters in non land-based (other) sectors who had to some extent thought about adopting renewable energy at their business premises. The level of interest they displayed ranged from picking up information during reading, to a small number who had progressed to obtaining a professional opinion. The group is sub-divided by their intentions, as far as they can be discerned, into those who may pursue renewable energy in future, and those who have decided not to pursue the issue further.
- 7.31 Seven firms fall into the category of 'Interested possibly proceed in the future'. These consist of two accommodation firms, three manufacturing firms, and two construction-related firms. A key finding, from four firms, was that the adoption of renewable energy depends on the firm's business development plan and its intention to invest in premises. For these firms a decision on the viability of renewable energy generation would be made in conjunction with project planning and capital investment decisions made at that time. One such business indicated a firm intention to move or expand premises, and to adopt renewable energy generating technology. Three more indicated a likely move, during the planning of which they would give serious consideration to renewable energy.
- 7.32 The plans of the remaining three firms were less developed and depended on obtaining information, particularly relating to finances.
- 7.33 Nine firms fall into the category of 'Interested but not proceeding'. For six of these (three of whom had obtained external advice) the finances of their

proposed projects were an insurmountable barrier, in particular the perceived large capital requirement and resulting long pay-back period. Unless these costings were to change significantly, they indicated that there would be no point in considering the matter further. Other barriers mentioned were finding that the site was unsuitable for solar panels; a move to different premises making plans for renewable energy redundant; and a lack of detailed information on which to base a decision.

- 7.34 All 16 Interested Non-adopters were asked what had inspired their interest in the subject. Multiple answers were provided by some respondents. The most common response was the media (10 respondents), followed by seeing or knowing someone with a working project (five respondents). Other responses included being in a relevant trade (two respondents), taking a relevant degree course, trade journals, own reading, business adviser, and attending an event (one respondent each). Two mentioned environmental concerns together with avoiding high utility charges. The construction-related firms believed that the adoption of renewable energy might be useful in attracting future customers.
- 7.35 To obtain further information or advice, three firms had approached suppliers for information, and three had approached consultants. The impression made on clients was patchy. One consultant was thought not to be impartial and one supplier who was expected to assess the suitability of the site was criticised as being over-interested in selling products. On the other hand some people thought they had been very well advised by suppliers (as had the Adopters group). A further firm had been put off by the £3000 charge for a survey to assess site suitability. Some references were made to other information sources including the Carbon Trust, Energy Saving Trust, and a visit to a demonstration project or special event. The need for independent knowledgeable advice was expressed by several respondents.
- 7.36 A source of uncertainty expressed by both land-based and other firms related to whether, in the event that they installed a wind turbine, they could supply the output to the National Grid.

NOT INTERESTED NON-ADOPTERS

- 7.37 This section discusses the 14 non land-based firms with no interest in adopting renewable energy. The firms were mostly manufacturing firms (some with retail) and construction firms. These firms dismissed the notion of introducing renewable energy for reasons relating to costs and practicality.
- 7.38 Most importantly, the issue was believed to be hardly worth considering because at present the required capital expenditure is too large relative to the projected cost savings. Some indicated it might be something they would have to think about in the event of a large increase in energy costs. Two firms said that consumption was too low to justify the effort and expenditure in pursuing the matter.
- 7.39 Several points emerged which illustrate how the respondents view the practicality of renewable energy and these are summarised here:
- As already discussed, adopting renewable energy can be linked to a development phase when the business acquires new premises. Many firms in this group were in modern premises on industrial estates likely to fulfil present and forthcoming needs. There would appear to be little

prospect of further capital investment or redevelopment of these buildings taking place in the medium term, the likely time when renewable energy technology might be installed.

- Tenants reported that there was little point in making capital investments such as solar panels as they might not benefit from the investment.
- Existing renewable energy technologies are inappropriate for some sites and activities. For example, technologies producing hot water (solar hot water, biomass boilers) may be of little use in meeting energy demands in manufacturing. Doubt was also expressed about whether sufficient energy could be delivered by renewable technology for some manufacturing activities, unless a very large capital investment was made, say in large wind turbines.
- To share costs or to overcome the problems of tenancy, a small number of firms on industrial estates (in both owned and rented premises) suggested that if an initiative was taken (perhaps by the landlord or the council) to supply several firms with renewable energy then they might be interested in being included.
- High environmental quality was perceived to be a barrier for some. Two firms with land indicated that wind turbines would be unacceptable because of their landscape impact. Another business was located in a listed building, and the owner was certain that planning permission would not be granted for wind turbines or solar panels.

Supply chain opportunities

- 7.40 All firms were asked whether, in the event of increased demand by consumers and businesses for renewable energy and its associated technologies, new supply chain opportunities would exist for them. In all, 13 non land-based firms identified possible opportunities, although some of these were fairly speculative. These firms were concentrated in the manufacturing, construction and retail sectors. Additionally two land-based businesses who expressed a possible interest in installing wind turbines would do so with the objective of selling energy to the National Grid.
- 7.41 The non land-based firms were divided into two groups. The first consists of six firms for which the new opportunity is essentially an extension of their present activities and for which they possess the requisite human capital. Of these, two manufacturing firms anticipated the possibility of making or assembling bespoke components for renewable energy equipment; a retailer would expand the range of products offered; and the client base of an experienced builder and an energy consultant would increase. The remaining firm suggested installing a wind turbine and supplying to the National Grid, the necessary skills for which were available in-house.
- 7.42 For the second group, consisting of seven firms in the manufacturing sector or in construction and installation activities, the possible supply chain opportunities represented a diversification from their present activities. Three firms suggested they might research, develop and manufacture new products.

Two construction firms and two heating engineers/suppliers might add solar power installation to their product range.

7.43 The following suggestions were put forward by firms for taking these ideas further:

- Foremost was an authoritative and reliable assessment of the practical and financial viability of the project;
- For some firms, establishing links with other businesses would be important. For example a construction firm might need to collaborate with a solar panel manufacturer. Liaison with specialist companies to get connected to the National Grid would be necessary for three firms interested in wind turbines;
- Establishing market contacts would be valuable for firms hoping to manufacture components;
- Three construction/installation firms indicated that they would need to expand staff skills, for example, to gain expertise in solar panel technology. This might be achieved by recruiting new staff, training staff, or working with suppliers;
- Several firms would need convincing evidence of changes in consumer tastes before pursuing these activities, implying that the availability of market research and the promotion of renewable energy to the public would be valuable to them;
- Project planning skills would be needed;
- Two firms emphasised that the availability of investment finance would be important.

8. Conclusions

8.1 This research study has been undertaken to provide insights into attitudes within a sample of the business community in Wear Valley and Teesdale towards renewable energy. The findings will be of value to those organisations involved in providing business support in determining how they might adapt future support programmes.

8.2 The issue of climate change is clearly high on the political agenda. This is reflected in the raft of policy statements and targets which have emerged in recent years from all levels of government designed to reduce CO₂ emissions, promote energy efficiency and encourage more energy to be generated from renewable sources. Moreover, in terms of economic regeneration, the North East Regional Economic Strategy identifies 'Energy and the Environment' as providing significant opportunities for industrial and employment growth in the region.

8.3 Policy clearly needs to be translated into action. However the short review conducted for this study reveals a somewhat bewildering array of schemes, programmes, initiatives and organisations in this field, many of which have a short time span. Within this complex constellation there would appear to be rather more clarity and certainty for the land-based industries than other sectors. It can be useful for programmes that are successful (such as Energy for Enterprise) to be re-visited, or at least for their successful components to be taken forward into new arrangements, rather than for new programmes to be constantly designed. It is critical that all organisations involved in the provision

of business support are better co-ordinated, with regional scale organisations drawing on the knowledge and links of locally-based agencies and networks.

- 8.4 Some of the physical attributes of the Teesdale/Wear Valley study area favour the generation of renewable energy (e.g. wind power) whilst others do not (e.g. energy crops). Projects currently at the planning stage within the area could act as important catalysts in developing the sector. At a strategic level the Eastgate scheme would create a major renewable energy-based business cluster, and likewise the Middleton in Teesdale initiative could have important local impacts.
- 8.5 The evidence assembled for this study and from other sources (such as the NERAF call for exemplar projects) indicates that, at the current time within the study area, there are relatively few examples of businesses that have adopted renewable energy technologies.
- 8.6 In relation to business attitudes towards renewable energy the survey findings should be treated with some caution because of the use of a purposive sampling methodology, the small size of the sample and the bias towards manufacturing firms. For these reasons the results should not be generalised or attributed to the wider population of firms in the study area.
- 8.7 Perhaps the simplest and most cost effective way of achieving a reduction in the carbon dioxide emissions of commercial and industry activity, without causing any risk to the local environment, would be to encourage firms to switch to a green tariff for mains electricity. Contact with a power procurement consultant suggests this is administratively easy to achieve, that most energy companies offer them, and the switch should not result in increased expenditure. Only two survey respondents used a green utility supply and most others appeared to be unaware of their availability. There is, however, significant interest amongst the survey sample in energy efficiency audits which have the potential to point towards renewable energy technology applications.
- 8.8 The businesses that have adopted renewable energy solutions and those that had seriously investigated the possibilities used a variety of sources of advice. Albeit from a very small sample, it should be of concern that some of the developers of the systems that have been installed needed to look beyond the region for technical expertise.
- 8.9 There is evidence to suggest that some of the earlier barriers to renewable energy developments presented by the planning system are being overcome as planning authorities and potential objectors to schemes become more experienced in dealing with the issues. Furthermore current policy guidance provided to planning authorities by the government encourages a more proactive stance to be taken to renewable energy projects. Nevertheless there is still a need for planners to take a more pragmatic view to projects involving renewable technologies, and to ensure a sensible balance is struck between economic interests and environmental sensitivities, on a project by project basis. This more pragmatic approach may well develop as more micro-renewable schemes are implemented and as the installations become a more familiar and accepted feature within settlements and in the wider landscape.
- 8.10 Business support providers clearly have a pivotal role in raising awareness of renewable energy technologies and supplying basic information on energy issues. The research findings indicate that the various types of news media are important in stimulating interest in renewable energy, together with journal and

press articles, briefing materials, trade stands and promotional events. Also important in this regard is the presence in the locality of working examples of renewable energy technologies which can be seen and explained. The importance of the initiative in Tynedale (para 6.1) lies not so much in the creation of a trail but in the assembly of a network of renewable energy projects where the business proprietors are positive about demonstration and the sharing of technical and financial data. As more renewable energy projects come on stream the formation of a similar network for Teesdale and Wear Valley should be given serious consideration.

- 8.11 Since this is a highly specialised area the main role for front line business support staff - the business advisers and account managers - will be to act as a first point of contact for clients, carrying out some preliminary assessment of a firm's energy usage and potential for renewable energy generation, alongside the usual advice relating to accounting, marketing, project planning, etc, and to signpost them to sources of technical help and expertise where appropriate. This is however a rapidly changing and expanding domain. The research indicates that, above all, interested businesses need impartial site-specific advice on the suitability of different technologies (including planning issues) and financial information. The CREEL project being developed by Newcastle University (para 6.1) is intended to fulfil many of these requirements but is some way from coming to fruition. At present there is a strong reliance on suppliers to provide this information, and although some are very satisfactory, others are not. The Contact List for Resource Efficiency produced by the Enterprise Agency is useful but will need to be continually refreshed and updated. As the sector expands, some consideration will need to be given to matters relating to the competence, qualifications and accreditation of the companies that feature on the List.
- 8.12 In view of the institutional complexity referred to in Section 5, it is imperative that business support agencies collaborate and share information, for example, relating to grant schemes. Businesses value the independent, impartial advice that business support agencies can offer, and which is not always provided by consultants and sales personnel. There is also a role for support agencies in signposting businesses to other useful sources of information (through the Contact List mentioned above for example). The initiatives already taken by the Enterprise Agency for Wear Valley and Teesdale, for example, in working with independent consultants to provide renewable energy training for advisers have considerable merit but will need to be maintained and built upon.
- 8.13 The research confirms that the principal barrier to the adoption of renewable energy technology is the perception that the capital cost is too great and the time needed to realise a return on investment is too long. In some cases this had been confirmed by obtaining detailed costings. There is also a perception that the management input to successfully bring about such a project is too large. For some firms these preconceptions will be correct and it would be misleading to raise false expectations about the practical and/or financial benefits of renewable energy generation at least for the time being. Having said this, the research also identifies a possible window of opportunity linked to the growth path of businesses and in particular the replacement of capital equipment (for example an old boiler) or relocation to new business premises. There is therefore some scope to target renewable energy advice on firms in this position. In relation to the financial imperatives and size of the initial capital outlay there may be some value in examining alternative solutions such as buy-back schemes, the leasing of equipment or using specialist forms of investment

finance. These possibilities were rarely mentioned during the business interviews.

- 8.14 The situation in relation to capital grants is likely to remain unclear. However the provision of grant aid to assist firms in commissioning scoping or feasibility studies from independent sources, rather than relying on the sales pitch of commercial suppliers, would help to raise confidence and should in due course increase the number of renewable energy projects coming forward. Experience with previous schemes of this nature however indicates a high attrition rate and business advisers would have an important role in screening applicants to ensure that only high quality projects receive such funding.
- 8.15 The research has indicated that collaborative action by firms over renewable energy developments might be appropriate and advisers should be alert to these possibilities. It is certainly the case that the new RDPE, and Axes 1 and 3 in particular, which comes on stream in 2008 emphasises both collaborative activity and measures that make a positive contribution to the mitigation of and adaptation to climate change. This would appear to be a fertile area for further research, for example into the opportunities for timber waste from specialised manufacturing firms becoming recycled as a source of woodfuel. There are already precedents in the woodfuels sector within the region, notably those developed under the Northwoods project, although there still remains some uncertainty within the land-based industries about these initiatives which might need to be addressed through further awareness raising.
- 8.16 There may be scope for businesses to work collaboratively in other areas, for example, through jointly purchasing equipment or collectively negotiating prices for the sale of energy via energy companies to the National Grid. There is also value in encouraging businesses to share information and experiences of the short- and long-term cost implications of investing in renewable energy technologies. The Tynedale Renewable Energy Trail mentioned above is an exemplar in creating such an informal business network.
- 8.17 With regard to the land-based sector there are currently some highly relevant research projects taking place which are exploring the application of different renewable energy technologies at the farm level and evaluating the commercial as well as environmental and social impacts¹². These research projects all have strategies and mechanisms in place for stakeholder participation to ensure that the research findings are effectively communicated to the key audiences. If business support providers are to raise their profile and level of activity in this arena, it might be pertinent to review whether closer engagement with some of the research teams should be sought.

¹² Further information on relevant research is available through the Rural Economy and Land Use (RELU) Programme website at <http://www.relu.ac.uk/research/Theme%20B.htm>. The two most relevant projects for this study are those led by Charles Banks (entitled "*Energy Production on Farms through Anaerobic Digestion*") and Angela Karp (entitled "*Impacts of Increasing Land Use under Energy Crops*").