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Low carbon economy in Worcestershire

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Low carbon economy in Worcestershire

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Table of contents

TABLE OF CONTENTS **3**

1 INTRODUCTION **4**

2 AIM AND METHODOLOGY **5**

2.1 Aim 5
2.2 Research questions 5
2.3 Target audience 5
2.4 Methodology 5

3 CONTEXT **8**

3.1 National Context 8
3.2 Sub-national Context 10
3.3 Worcestershire Context 11

4 CLUSTERS **14**

5 OPPORTUNITIES **19**

5.1 Type of opportunities 19
5.2 Opportunity sectors assessment 19
5.3 Opportunities identified from the consultation 21

6 BARRIERS **23**

APPENDIX A: LIST OF SIC CODES **25**

Construction 25
Environmental goods and services 25
Farming, food and drink 25
Manufacture of metals and fabricated metal products 25
Manufacture of non-metallic mineral products 26
Manufacture of motor vehicles and transport 27
Public services 27
Transport, storage and communications 27

APPENDIX B: CONSULTATION QUESTIONNAIRE **28**

FULL DOCUMENT INFORMATION **29**

1 Introduction

In 2009, the Observatory was commissioned by Advantage West Midlands to carry out a major study into the opportunities for, risks and barriers to Growth into a low carbon economy. Part of this work was undertaken by Atkins and the resulting report was published at the beginning of 2010.

Following the original study, the Observatory, again working with Atkins, was commissioned by the City Region to identify more detail on the opportunities that the Low carbon economy can deliver in its area. The findings of this research were presented in a series of reports covering different geographies (the City Region, Birmingham, Coventry, Dudley, Sandwell, Solihull, Telford and Wrekin, Walsall and Wolverhampton).

With the creation of the Local Enterprise Partnerships, the Coalition Government is encouraging policymakers to think local. The evidence base has to move in the same direction. Therefore, we now propose to produce local profiles for those Local Authorities in the West Midlands not included in the City Region project. These are:

- Herefordshire
- Shropshire
- Staffordshire
- Stoke-on-Trent
- Warwickshire
- Worcestershire

The research is an important part of the evidence base for the Local Authority Low Carbon Economy Programme of support for local authorities, funded from the Climate Change Skills Fund and managed by Sustainability West Midlands on behalf of Improvement and Efficiency West Midlands. For further information about the Low Carbon Economy Programme, visit the Sustainability West Midlands website at www.sustainabilitywestmidlands.org.uk/projects/.

Finally, we would like to thank Elizabeth Alison at Worcestershire County Council for her support and engagement during the consultation stage.

2 Aim and methodology

2.1 Aim

The aim of this piece of research is to review the current situation and potential for the development of a low carbon economy in Worcestershire.

2.2 Research questions

The project focuses on answering the following research questions:

- Which of the opportunity sectors are best represented in Worcestershire?
- How many jobs are currently in these sectors? Would a low carbon economy secure these jobs or add new ones?
- Within Worcestershire are there any clusters of strength?
- Which opportunities are based on new technologies or products? Which are based on efficiencies and de-carbonising of existing products or processes?
- Would taking advantage of these opportunities reduce the potential impact of legislation on carbon constraints?
- What are the barriers to businesses accessing the new opportunities?
- What policy interventions could be made to overcome these barriers?

2.3 Target audience

Our target audience is local authority policy makers in Worcestershire. This research will help them understand the implications and actions required within local strategies in order to deliver a low carbon economy. It will also contribute to the evidence base informing the local economic assessment.

2.4 Methodology

The methodology proposed contains three stages which are set out below. This report incorporates findings from all stages.

1. **Conduct secondary data analysis** to identify the current situation of the opportunity sectors in Worcestershire. The Annual Business Inquiry provides data around the number of employees and number of business units by sector.

   The data allowed us to calculate the following indicators for Worcestershire and the West Midlands for the opportunity sectors:

   - Proportion of employees
   - Proportion of businesses
   - Employment growth rate
   - Absolute employment size by subsector
   - Proportion of employees by subsector
   - Absolute number of businesses by subsector
   - Proportion of businesses by subsector

   The data provided in this report has been rounded to the nearest 100 for employment figures and the nearest 10 for business units, as recommended by the Office for National Statistics.

   Appendix A provides a list with the SIC codes relevant to each opportunity sector. By using the same list when replicating the analysis, future results could be compared to the findings of this report. The list of SIC codes related to each opportunity sector was originally defined in the regional research[1].

   This stage will address the following research questions:

   - Which of the opportunity sectors are best represented in Worcestershire?
   - How many jobs are currently in these sectors?
   - Which opportunities are based on new technologies or products?
   - Which are based on efficiencies and de-carbonising of existing products or processes?

2. **Review** relevant **literature** around clusters and economic strengths for each local authority. This stage will address the following research question:

   - Within Worcestershire are there any clusters of strength?

[1] West Midlands Regional Observatory (2010) The Low Carbon Economy in the West Midlands, WMRO, UK

3. **Consultation with Local Authorities** to add their knowledge and expertise around the low carbon economy in their area. This stage is optional but will be a great opportunity to ensure that local authorities' views and knowledge are included in the research. In case we don't receive a response from the authorities, their results from the two previous stages will still be available for them to use.

   This stage will add further information relating to the research questions above and allow us to address the following research questions:

   - Within Worcestershire are there any clusters of strength?
   - Would taking advantage of these opportunities reduce the potential impact of legislation on carbon constraints?
   - What are the barriers to businesses accessing the new opportunities?
   - What policy interventions could be made to overcome these barriers?

   We conducted this stage through an electronic questionnaire that was distributed to each of the local authorities involved.

   We designed the questionnaire based on the one used in the City Region research. In this way, the results can be compared across local authorities.

   Appendix B shows the questionnaire sent to all local authorities.

3 Context

3.1 National context

The results of the general election held in the UK on 6th May 2010 delivered a historic moment in which the coalition government was born. The document 'The Coalition: our programme for government[2]' summarises the programme of work for the next five years. The low carbon economy is part of this programme.

The document states[3]:

"The government believes that climate change is one of the gravest threats we face, and that urgent action at home and abroad is required. We need to use a wide range of levers to cut carbon emissions, decarbonise the economy and support the creation of new green jobs and technologies"

The Coalition: our programme for government

Some actions outlined in the programme encouraging the move towards the low carbon economy are to:

- Push for the EU to demonstrate leadership in tackling international climate change, including supporting an increase in the EU emission reduction target to 30per cent by 2020.
- Seek to increase the target for energy from renewable sources, subject to the advice of the Climate Change Committee.
- Through the 'Green Deal', encourage home energy efficiency improvements paid for by savings from energy bills. Also take measures to improve energy efficiency in businesses and public sector buildings.
- Reduce central government carbon emissions by 10 per cent within 12 months.
- Ensure more efficient use of water.
- Work towards a 'zero waste' economy, encouraging councils to pay people to recycle and work to reduce littering.
- Create a presumption in favour of sustainable development in the planning system.

The Department for Business, Innovation and Skills has also recognised the importance of the low carbon economy in achieving sustainable growth:

"… we need to build a sustainable economy that is greener, more enterprising, more technologically advanced, more balanced across the regions and grounded in diverse sources of sectoral strength. We need an economy where private sector jobs are created and innovative opportunities seized. We need to respond to the challenges of a globalised and low carbon eco-friendly economy and support businesses to realise their ambitions"

A strategy for sustainable growth[4]

In addition the strategy recognises that without investment in key infrastructure such as transport links, information communication technologies, green energy, water and waste the UK's competitiveness and move to a greener economy are at risk[5].

Finally, the vision of the Department of Energy and Climate Change is of a thriving, globally competitive, low carbon energy economy. This represents a challenge but will also deliver clear opportunities as the Business Plan of the Department of Energy and Climate Change states:

"Achieving this [vision] through a long term transition to secure, affordable, low carbon energy on the way to an 80per cent cut in greenhouse gas emissions by 2050 will mean a transformation in the way we generate and use energy. … decarbonising our energy use will mean far more use of electricity in our transport system, in the way we heat our homes and businesses, and in the way our industry operates.

Making that change offers great opportunities, creating a wealth of new green jobs as we reform our system and infrastructure, helping to protect our economy … as we establish the low carbon technologies that will be at the heart of our energy system."

Business Plan 2011-2015[6]

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2 HM Government (2010*) The Coalition: our programme for government*, Cabinet Office, UK
3 Ibid p. 16
4 Department for Business Innovation & Skills (2010) *A strategy for sustainable growth*, UK, p.4
5 Ibid, p.8
6 Department for Energy and Climate Change (2010) *Business Plan 2011-2015*, UK, p.1

3.2 Sub-national context

In January 2010, the West Midlands Regional Observatory published the report 'Low carbon economy in the West Midlands'[7]. The aim of this piece of research was to develop a better understanding of the low carbon economy in the West Midlands.

This research delivered the following findings:

1. Health and social work, transport and communications, education and construction were identified as sectors which are both heavily affected by carbon reduction policies and are regionally significant (accounting for over 5per cent of total regional employment).

2. The following eight sectors were identified as good prospects in terms of future growth in the low carbon economy in the West Midlands: Manufacture of non-metallic mineral goods; manufacture of automotive and transport equipment; manufacture of metals and fabricated metal products and electrical equipment; construction; environmental goods and services; manufacture of food and beverages (including farming); transport, storage and communications; and public services.

3. Opportunities in the low carbon economy can be achieved mainly in two ways: by diversifying into new low carbon products and services or by reducing the level of CO_2 emissions involved in the current products and services (decarbonising).

4. Identified barriers to overcome in order to move towards a low carbon economy were consumer demand, the policy and regulatory regime, physical and institutional infrastructure, skills, business advice, planning, fostering innovation and technology and attracting foreign markets and investment. Sub-national influence can play a crucial role in overcoming these barriers especially around physical and institutional infrastructure, and skills.

5. The public sector can play an important role encouraging the uptake of low carbon opportunities across the West Midlands. This role can be exercised in a number of ways, including: (a) Providing guidance on sustainable or low carbon procurement for public sector; (b) Demonstrating best practice in own procurement and funding methods and (c) Developing carbon calculation tools.

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[7] West Midlands Regional Observatory (2010) *The Low Carbon Economy in the West Midlands,* WMRO, UK

3.3 Worcestershire context

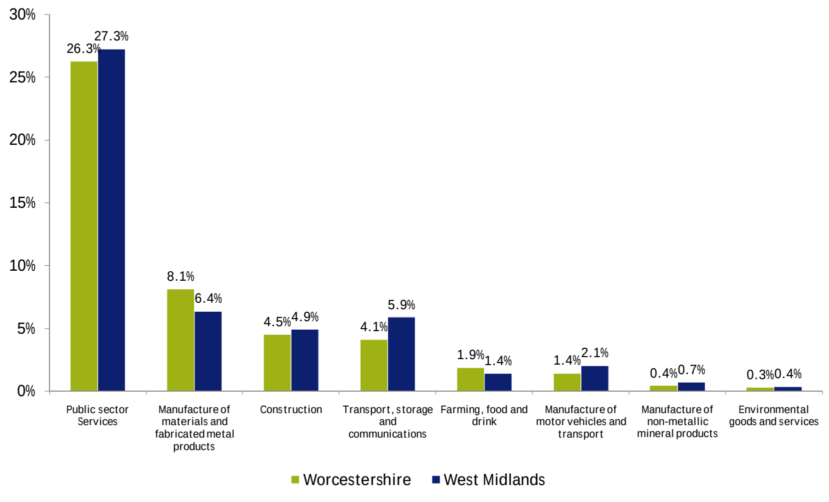
The economic strategy for Worcestershire recognises that 'the economic growth of the County will not however be achieved at the expense of the environment'[8].

The low carbon economy opportunities are highlighted as a key driver to deliver a successful economic strategy. Private sector and government play a crucial role maximising the potential for innovation, job creation and growth in the transition to a low carbon economy[9].

Figure 1 shows the employment in low carbon opportunity sectors in Worcestershire and the West Midlands. One in four people in Worcestershire work in public sector services.

Manufacture of materials and fabricated metal products; and farming, food and drink are the sectors in which Worcestershire has higher levels of employment compared to the West Midlands.

Figure 1: Proportion of employment in opportunity sectors in (2008)



Source: Annual Business Enquiry, analysis prepared by WMRO

West Midlands Regional Observatory 2010

Figure 2 shows the proportion of businesses in each of the opportunity sectors. Construction, public sector services, transport, storage & communications and manufacture of materials & fabricated metal products are the sectors with the greatest proportions of businesses.

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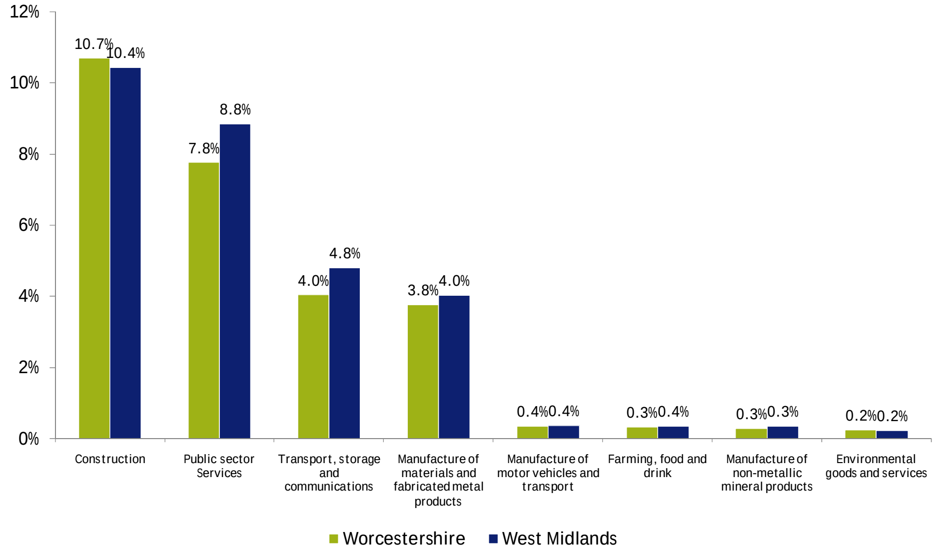
8 Worcestershire County Council, (2010) *An Economic Strategy for Worcestershire*, p. 13
9 Ibid, p.19

Construction is the only sector with higher proportion of businesses compared to the West Midlands.

Figure 2: Proportion of businesses in opportunity sectors in (2008)



Source: Annual Business Enquiry, analysis prepared by WMRO

West Midlands Regional Observatory 2010

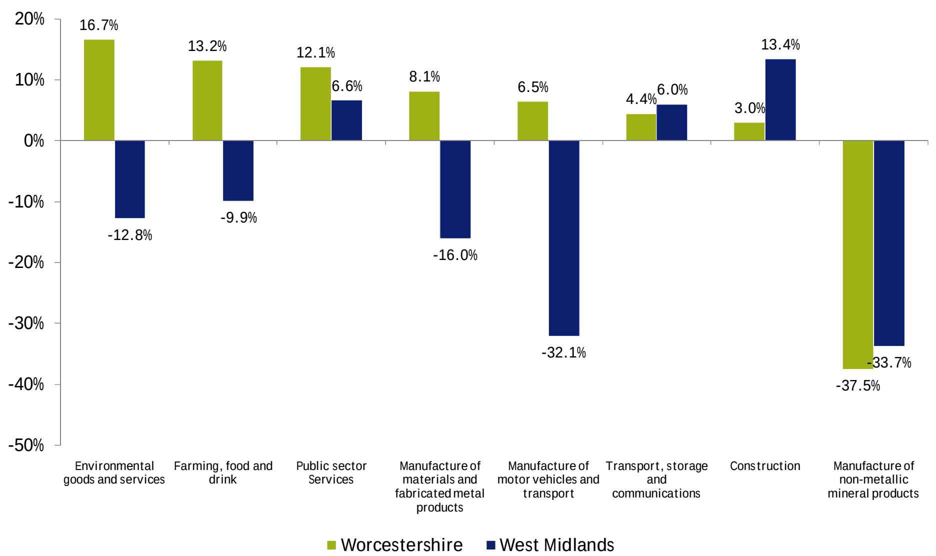
Figure 3 shows the employment growth rate for the opportunity sectors in Worcestershire and the West Midlands. The sectors that have achieved an increase in employment in Worcestershire are:

- Environmental goods and services
- Farming, food and drink
- Public sector services
- Manufacture of materials and fabricated metal products
- Manufacture of motor vehicles and transport
- Transport, storage and communications
- Construction

The sectors in which Worcestershire has a growth rate above the West Midlands one are:

- Environmental goods and services
- Farming, food and drink
- Public sector services
- Manufacture of materials and fabricated metal products
- Manufacture of motor vehicles and transport

Figure 3: Employment growth rate for opportunity sectors (2003-2008)



Source: Annual Business Enquiry, analysis prepared by WMRO

West Midlands Regional Observatory 2010

4 Clusters

The Economic Strategy identifies that Worcestershire has a significant number of businesses within growth sectors for the future. These are[10]:

- Digital economy
- Creative industries
- Advanced manufacturing
- Life sciences
- Low carbon industrial and business opportunities

The Regional Skills Assessment 2009 identified local hot spots of employment in key business clusters. The following are the clusters with a significant number of jobs in Worcestershire[11]:

- Digital media
- Food and drink
- ICT
- Interiors and lifestyle (particularly, carpets in Kidderminster)
- Tourism and leisure

The Consultation highlighted that some specific sectors or categories of business have been identified nationally where a targeted approach is considered worthwhile. These are the sectors with potential opportunities for economic and employment growth and where actions can have a real impact. Worcestershire has a significant number of these businesses identified within growth sectors for the future:

1. **Digital economy** – Priorities fall into communications infrastructure, digital participation and digital content.

2. **Creative industries** – These are based on individual creativity, skill and talent, and those with the potential to create wealth and jobs through developing intellectual property. There are 13 recognised creative sectors including software and computer services, publishing, radio, television and advertising.

[10] Ibid.
[11] West Midlands Regional Observatory (2009) *Regional Skills Assessment 2009 – skills issues in key business clusters*, December 2009.

3. **Low Carbon Industrial and business opportunities** – The potential for innovation, job creation and growth in the transition to a low carbon, climate-resilient economy depends on both massive dynamism in the private sector and a strategic role for Government.

4. **Advanced Manufacturing** – These are businesses which use a high level of design or scientific skills to produce technologically complex, high value products and processes.

5. **Life Sciences** – Priorities for life sciences are pharmaceutical, medical biotechnology and medical technology companies. The Government aims to make the UK the country of choice for life sciences companies to do business and Worcestershire must highlight its advantages to businesses wishing to locate here and operate in this sector.

The following were also highlighted as relevant cluster support for the development of the low carbon economy in Worcestershire:

- QinetiQ
- University of Worcester
- Science parks – Malvern, Bromsgrove
- Central Technology Belt
- Worcester Bosch

The Annual Business Inquiry data allow us to review key strengths within each of the eight opportunity sectors in Worcestershire. Table 1 below shows the largest subsectors measured by the number of employees and businesses in each of them.

In addition to providing the absolute figures by subsector, we also provide the relative proportion of employees and businesses for Worcestershire and the West Midlands.

Table 1: Largest subsectors in each opportunity sector (2008)

Sector	Largest employment subsectors	Number of employees	Proportion of employees (W:WM)	Largest businesses subsectors	Number of businesses	Proportion of businesses (W:WM)
Public sector services	Human health activities	16,200	27%:27%	Social work activities	630	32%:33%
	Primary education	12,200	20%:17%	Human health activities	510	26%:26%
	Social work activities	9,600	16%:16%	Primary education	270	14%:13%
Manufacture of materials and fabricated metal products	Manufacture of fabricated metal products, except machinery and equipment	7,400	40%:44%	Manufacture of fabricated metal products, except machinery and equipment	450	47%:56%
	Manufacture of machinery and equipment not elsewhere classified	4,200	23%:26%	Manufacture of machinery and equipment not elsewhere classified	240	25%:23%
	Manufacture basic metals	2,100	11%:11%	Manufacture of electrical machinery and apparatus not elsewhere classified	90	9%:7%
Construction	Building of complete construction or parts thereof, civil engineering	4,900	48%:47%	Building of complete construction or parts thereof, civil engineering	1,070	40%:39%
	Building installation	3,300	32%:33%	Building installation	850	31%:31%
	Building completion	1,900	18%:17%	Building completion	720	27%:27%

Sector	Largest employment subsectors	Number of employees	Proportion of employees (W:WM)	Largest businesses subsectors	Number of businesses	Proportion of businesses (W:WM)
Transport, storage and communications	Land transport; transport via pipelines	4,600	49%:38%	Land transport; transport via pipelines	500	49%:51%
	Post and telecommunications	2,900	31%:32%	Post and telecommunications	300	29%:26%
	Supporting and auxiliary transport activities; activities of travel agencies	1,800	19%:28%	Supporting and auxiliary transport activities; activities of travel agencies	210	21%:21%
Farming, food and drink	Manufacture of other food products	1,500	35%:41%	Manufacture of other food products	40	50%:41%
Manufacture of motor vehicles and transport	Manufacture of parts and accessories for motor vehicles and their engines	1,800	55%:41%	Manufacture of parts and accessories for motor vehicles and their engines	30	33%:42%
	Building and repairing of ships and boats	700	21%:2%	Building and repairing of ships and boats	20	22%:14%
Manufacture of non-metallic goods	No detailed statistics available[12]	-	-	No detailed statistics available[12]	-	-
Environmental goods and services	Recycling of non-metal waste and scrap	100	40%:31%	Recycling of non-metal waste	20	14%:10%

Source: Annual Business Inquiry. Table prepared by WMRO.

[12] Due to confidentiality issues, the data had to be suppressed

The subsectors with the highest absolute **employment** figures in Worcestershire and with a higher employment proportion than the West Midlands one are:

- Primary education
- Building of complete construction of parts thereof, civil engineering
- Building completion
- Land transport; transport via pipelines
- Manufacture of parts and accessories for motor vehicles and their engines
- Building and repairing of ships and boats
- Recycling of non-metal waste and scrap

The subsectors with the highest absolute **number of businesses** in Worcestershire with and a higher business proportion than the West Midlands one are:

- Primary education
- Manufacture of machinery and equipment not elsewhere classified
- Manufacture of electrical machinery and apparatus not elsewhere classified
- Building of complete construction of parts thereof, civil engineering
- Post and telecommunications
- Manufacture of other food products
- Building and repairing of ships and boats
- Recycling of non-metal waste and scrap

5 Opportunities

5.1 Type of opportunities

The sub-national report[13] categorised each of the eight opportunity sectors across the two main types of opportunities: diversification and decarbonisation.

Diversification refers to the process of creating and developing new products and services that deliver lower level of carbon emissions than the traditional ones. The sectors with the greatest diversification opportunities are:

- Construction
- Environmental goods and services
- Farming, food and drink
- Manufacture of materials and fabricated metal products
- Manufacture of non-metallic mineral products
- Manufacture of motor vehicles and transport
- Transport and storage and communications

Decarbonising refers to the process of delivering products and services more efficiently. This includes using less raw material, less energy or producing less waste. The sector with the greatest decarbonising opportunities is public services

5.2 Opportunity sectors assessment

In order to identify which of the sectors provide the most opportunity for development of a low carbon economy within Worcestershire, we conducted a ranking exercise including the following elements:

1. **Sub-national ranking of sectoral opportunities**[14] - This ranking involved four criteria: carbon regulation, scale of opportunity, existing strengths in the West Midlands and existing actions in the West Midlands. The ranking scores ranged between 1 (high level of opportunity) and 10 (low level of opportunity).

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[13] West Midlands Regional Observatory (2010) The Low Carbon Economy in the West Midlands, WMRO, UK

[14] West Midlands Regi1onal Observatory (2010) *The Low Carbon Economy in the West Midlands,* WMRO, UK, pp. 19-21

2. **Worcestershire employment data** – The ranking scores ranged between 1 (the sector with the highest number of employees) and 8 (the sector with the lowest number of employees).

3. **Worcestershire business data** - The ranking scores ranged between 1 (the sector with the highest number of businesses) and 8 (the sector with the lowest number of businesses).

Table 2 shows the ranking for each of the three elements listed before. For the overall ranking, the lower the value the greater the low carbon opportunity will be. The overall ranking was calculated using the following formula:

$$\text{Overal Ranking} = \text{Sub-national ranking} + \left(\frac{\text{Local employment ranking + local number of businesses}}{2} \right)$$

Table 2: Ranking of sectors for Low Carbon Opportunities in Worcestershire (2008)

Sector	Sub-national ranking	No. employees	No. employees ranking	No. businesses	No. businesses ranking	Overall ranking
Construction	3	10,300	3	2,700	1	5
Environmental goods and services	3	700	8	60	8	11
Farming, food and drink	6	4,300	5	80	6	11.5
Manufacture of materials and fabricated metal products	3	18,600	2	950	4	6
Manufacture of non-metallic mineral products	1	1,000	7	70	7	8
Manufacture of motor vehicles and transport	1	3,300	6	90	5	6.5
Public services	7	60,000	1	1,960	2	8.5
Transport storage and communications	7	9,400	4	1,020	3	10.5

Source: Annual Business Inquiry. Table prepared by WMRO.

The sectors with the greatest opportunities in Worcestershire, highlighted in green, are:

- Construction
- Manufacture of materials and fabricated metal products
- Manufacture of motor vehicles and transport

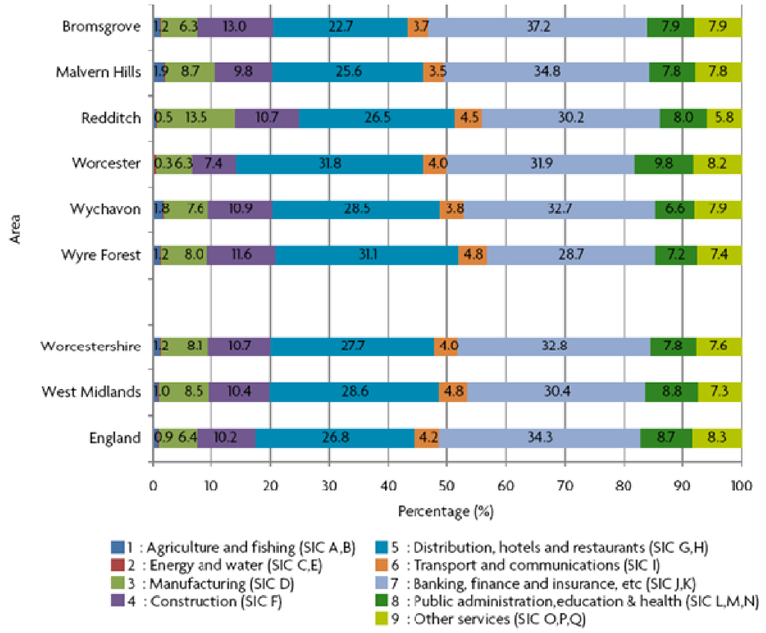
5.3 Opportunities identified from the consultation

Figure 4 shows the business structure of Worcestershire in 2008. Almost one-third of businesses in Worcestershire are classified as Banking, Finance and Insurance, with a further 28 per cent classed as Distribution, Hotels and Restaurants. Businesses in these industries employ 17 per cent and 25 per cent of Worcestershire employees respectively.

Just 8 per cent of businesses are classified as Public Administration, Education and Health, but these employ more than 26 per cent of the Worcestershire workforce.

A larger proportion of businesses in Worcestershire are involved in manufacturing (8 per cent) than is the case across England (6 per cent). The proportion is particularly marked in Redditch, where 14 per cent of businesses are Manufacturing, employing some 25 per cent of the workforce.

Figure 4. Business structure, 2008



Source: Office for National Statistics, 2008 Annual Business Inquiry, 2008
Chart provided by Worcestershire County Council through the consultation stage

West Midlands Regional Observatory 2010

Examples of low carbon opportunities in these sectors include:

- Energy efficiency will improve profitability across all sectors
- Waste products recycled to create energy sources such as biodigestion in the food sector
- Greener processes and new green products can be opportunities in manufacturing

The following are specific opportunities for Worcester with regards to developing a low carbon economy:

- Public sector joint procurement
- Housing stock – building regulations and FITS
- Total Place possibilities
- Combined heat and power & district heating in urban areas
- Feed in tariffs (sell unwanted energy back to the grid)
- Research and development around low carbon technology

Finally, a low carbon approach could protect employment in Worcestershire through:

- Less money spent on energy to invest in growth and hence retaining or expanding jobs
- New product development to retain or expand jobs
- Retain skilled staff via loyalty to green values

6 Barriers

The sub-national research[15] identified the following as the main barriers to a transition to a low carbon economy:

- Consumer demand
- Policy and regulatory regime
- Physical and institutional infrastructure
- Skills
- Business advice
- Planning
- Fostering innovation and technology
- Attracting foreign markets and investment

The research also identified the crucial role that government can play mainly through interventions to correct the high levels of information failures that exist in recognising low carbon business opportunities.

The consultation identified the following as the barriers for the low carbon economy in Worcestershire:

- Reducing emissions is not seen as a strategic priority for many organisations, and many businesses and public sector organisations do not yet understand how they need to change.
- For businesses that do wish to develop and sell low carbon technologies, getting access to long term capital can be difficult because the longer payback periods and risk of technology failure can put businesses and investors off. This challenge is particularly difficult for small- and medium-sized businesses with limited or no track record.
- Accreditation costs for SMEs for installation of renewables.
- Lack of skills.

More specifically for SMEs the barriers include[16]:

- Lack of awareness of local and national initiatives
- Duplication across organisations delivering the same services, such as Business Link, Envirowise, WEBG
- Lack of understanding of sustainability issues
- Time and motivation

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[15] West Midlands Regional Observatory (2010) The Low Carbon Economy in the West Midlands, WMRO, UK

[16] Williams R. (2009) Environmental support for business: a report on the provision of environmental business support and initiatives in Worcestershire.

- At a time when survival is the main aim of most companies, environmental issues must be seen as relevant and making a contribution to the bottom line.
- Short term thinking.
- Lack of funds.

The local authority can take actions to overcome these barriers. The consultation identified that Worcestershire could:

- Gather data on issues and opportunities
- Seek and deliver funding to support SMEs wanting to use low carbon technologies
- Working with colleges to ensure that the county trains and retains people so that they have the skills required

Finally, more specifically around procurement, Worcestershire County Council could:

- Provide information on the Worcestershire Procurement Portal and relevant links to raise awareness of opportunities
- Keep green issues as local as possible to benefit local businesses and supply chains
- Carry on purchasing green energy through a public sector consortium
- Operate a sustainable procurement policy. Worcestershire County Council already issues guidance on sustainable procurement to staff.

Appendix A: List of SIC codes

Construction

- 451: Site preparation
- 452: Building of complete construction or parts thereof; civil engineering
- 453: Building installation
- 454: Building completion
- 455: Renting of construction or demolition equipment with operator

Environmental goods and services

- 3110: Manufacture of electric motors, generators and transformers
- 3120: Manufacture of electricity distribution and control apparatus
- 3710: Recycling of metal waste and scrap
- 3720: Recycling of non-metal waste and scrap

Farming, food and drink

- 151: Production, processing and preserving of meat and meat products
- 152: Processing and preserving of fish and fish products
- 153: Processing and preserving of fruit and vegetables
- 154: Manufacture of vegetable and animal oils and fats
- 155: Manufacture of dairy products
- 156: Manufacture of grain mill products, starches and starch products
- 157: Manufacture of prepared animal feeds
- 158: Manufacture of other food products
- 159: Manufacture of beverages

Manufacture of metals and fabricated metal products

- 27: Manufacture basic metals

- 28: Manufacture of fabricated metal products, except machinery and equipment
- 29: Manufacture of machinery and equipment not elsewhere classified
- 30: Manufacture of office machinery and computers
- 31: Manufacture of electrical machinery and apparatus not elsewhere classified
- 32: Manufacture of radio, television and communication equipment and apparatus
- 33: Manufacture of medical, precision and optical instruments, watches and clocks

Manufacture of non-metallic mineral products

- 2611: Manufacture of flat glass
- 2612: Shaping and processing of flat glass
- 2613: Manufacture of hollow glass
- 2614: Manufacture of glass fibres
- 2615: Manufacture and processing of other glass including technical glassware
- 2621: Manufacture of ceramic household and ornamental articles
- 2622: Manufacture of ceramic sanitary fixtures
- 2623: Manufacture of ceramic insulators and insulating fittings
- 2624: Manufacture of other technical ceramic products
- 2625: Manufacture of other ceramic products
- 2626: Manufacture of refractory ceramic products
- 2630: Manufacture of ceramic tiles and flags
- 2640: Manufacture of bricks, tiles and construction products, in baked clay
- 2651: Manufacture of cement
- 2652: Manufacture of lime
- 2653: Manufacture of plaster
- 2661: Manufacture of concrete products for construction purposes
- 2662: Manufacture of plaster products for construction purposes
- 2663: Manufacture of ready-mixed concrete
- 2664: Manufacture of mortars
- 2665: Manufacture of fibre cement
- 2666: Manufacture of other articles of concrete, plaster and cement
- 2670: Cutting, shaping and finishing of stone
- 2681: Production of abrasive products
- 2682: Manufacture of other non-metallic mineral products not elsewhere classified

Manufacture of motor vehicles and transport

- 341: Manufacture of motor vehicles
- 342: Manufacture of bodies (coachwork) for motor vehicles: manufacture of trailers and semi-trailers
- 343: Manufacture of parts and accessories for motor vehicles and their engines
- 351: Building and repairing of ships and boats
- 352: Manufacture of railway and tramway locomotives and rolling stock
- 353: Manufacture of aircraft and spacecraft
- 354 Manufacture of motorcycles and bicycles
- 355: Manufacture of other transport equipment not elsewhere classified

Public services

- 751: Administration of the State and the economic and social policy of the community
- 752: Provision of services to the community as a whole
- 753: Compulsory social security activities
- 801: Primary education
- 802: Secondary education
- 803: Higher education
- 804: Adult and other education
- 851: Human health activities
- 852: Veterinary activities
- 853: Social work activities

Transport, storage and communications

- 60: Land transport; transport via pipelines
- 61: Water transport
- 62: Air transport
- 63: Supporting and auxiliary transport activities; activities of travel agencies
- 64: Post and telecommunications

Appendix B: Consultation questionnaire

1. Which business sectors have the most employment and businesses in your local authority? Can you identify potential low carbon opportunities in these sectors?

2. What do you consider to be the specific opportunities for your area with regards to developing a low carbon economy?

3. What relevant clusters exist to support the development of a low carbon economy? E.g. universities, science parks, research organisations, company start-ups.

4. How can a low carbon approach protect employment in your local authority area?

5. What do you consider to be the general and specific barriers for the low carbon economy in your area?

6. What actions can the local authority take to overcome these barriers?

7. What can the local authority do with regards to procurement?

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