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Low carbon economy in Staffordshire

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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 Jonathan Vining at Staffordshire County Council for his 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 Staffordshire.

2.2 Research questions

The project focuses on answering the following research questions:

- Which of the opportunity sectors are best represented in Staffordshire?
- How many jobs are currently in these sectors? Would a low carbon economy secure these jobs or add new ones?
- Within Staffordshire 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 Staffordshire. 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 Staffordshire. 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 Staffordshire 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 research¹.

This stage will address the following research questions:

- Which of the opportunity sectors are best represented Staffordshire?
- 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 Staffordshire are there any clusters of strength?

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, the results from the two previous stages will still be available for them to use.

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

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

- Within Staffordshire 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 states³:

"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 30 per 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 risk⁵.

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

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 CO₂ 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.

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

3.3 Staffordshire context

The Sustainable Community Strategy for Staffordshire sets a fifteen year vision to improve the quality of life for all people, by increasing economic prosperity, improving local services, and developing partnership working⁸.

The low carbon economy is important in achieving this vision. The strategy states⁹:

Together as individuals, businesses and communities, we will have greatly increased our ability to adapt and cope with environmental challenges, in particular climate change and extreme weather events.

Sustainable Communities Strategy for Staffordshire

Specific actions set in the strategy related to the low carbon economy include¹⁰:

- Using our natural resources to support the development of the economy, but managing them in a sustainable way.
- Encouraging more sustainable construction, securing high levels of resource and energy efficiency and a reduction in carbon emissions, contributing to sustainable transport, enhancing biodiversity and helping to tackle climate change.
- Reducing our carbon emissions and making a commitment to live more sustainable lives
- Managing waste in ways which reduce environmental impact and support the economy and local communities and producing less waste, ensuring waste is being re-used, recycled, composted and used to produce energy

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

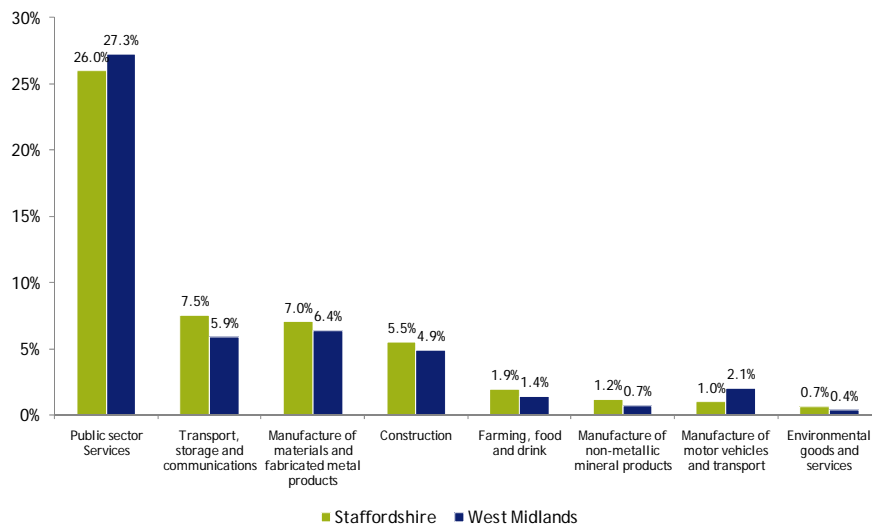
Transport, storage and communications; manufacture of materials and fabricated metal products, construction, farming, food and drink; manufacture of non-metal mineral products are the sectors in which Staffordshire has higher levels of employment compared to the West Midlands.

⁸ Staffordshire Strategic Partnership (2008) Our County, Our Vision: A sustainable community strategy for Staffordshire 2008-2023, p.18

⁹ Ibid, p. 22

¹⁰ Ibid

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



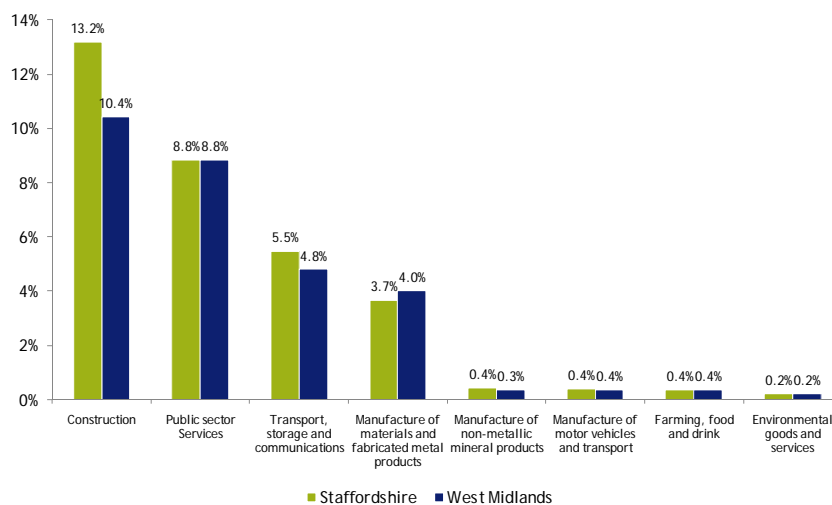
Source: Annual Business Enquiry, analysis prepared by WMRO

West Midlands Regional Observatory 2010

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

Construction and transport, storage and communications are the sectors with higher proportions 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

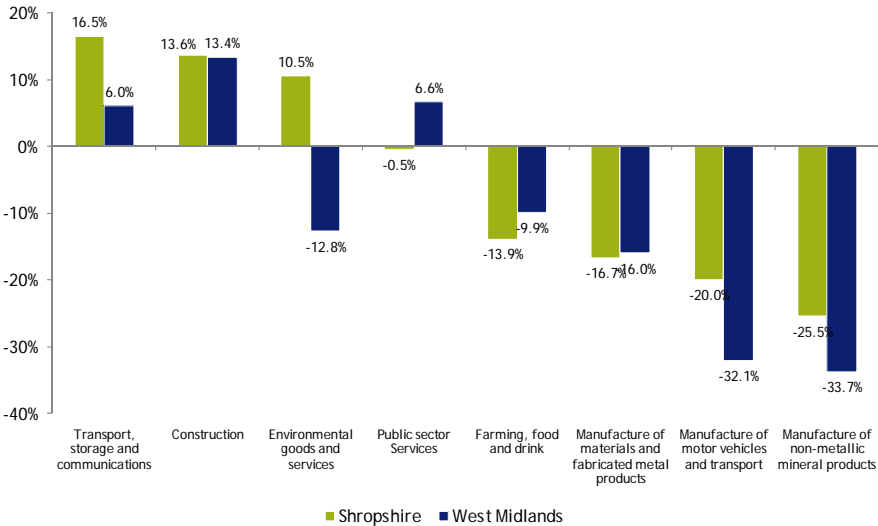
Figure 3 shows the employment growth rate for the low carbon opportunity sectors in Staffordshire and the West Midlands between 2003 and 2008. The sectors that have achieved an increase in employment in Staffordshire are:

- Transport, storage and communications
- Construction
- Environmental goods and services

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

- Transport, storage and communications
- Environmental goods and services

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



Source: Annual Business Enquiry, analysis prepared by WMRO

4 Clusters

The state of Staffordshire 2010 highlights the following relevant clusters in the local authority¹¹:

- The rural economy is a significant part of the overall economy and accounts for around 25 per cent of the local business base, although much of this is around the hinterlands of the principal settlements and market towns. The agricultural sector is traditionally strong in Staffordshire, and has close links with the food and drink cluster and tourism and leisure sectors locally.
- It is expected that the 'environmental technologies' cluster will emerge in the local economy, as this cluster has seen a growth in employment over the past 5 years, with a higher proportion of employment in the cluster than the West Midlands average.

The Regional Skills Assessment 2009 identified local hot spots of employment in key business clusters. The clusters with a significant number of jobs in Staffordshire are¹²:

- Building technologies
- Business and professional services
- Digital media
- Environmental technologies
- Transport technologies
- Tourism and leisure

The Consultation identified that there are established companies operating in the environmental technology cluster around Stafford, and along the A34 corridor from Cannock in the south to Newcastle-under-Lyme in the north, some examples include:

1. Areva T & D in Stafford is a global leader in energy distribution and intends to create a world research facility in the town, this is likely to provide some clustering/agglomeration effects.
2. Convertteam in Kidsgrove is another worldwide specialist in the power conversion industry, with other examples of businesses in the environmental technologies clustered along the A34 corridor.

¹¹ Staffordshire County Council (2010) *State of Staffordshire 2010*, November 2010, p. 44

¹² West Midlands Regional Observatory (2009) *Regional Skills Assessment 2009 - skills issues in key business clusters*, December 2009

3. Keele Science Park has been successful in attracting high value added companies, particularly linked to medical technologies, and is now keen to diversify its offers to suit companies in the wider environmental technologies.
4. Finally, in Southern Staffordshire several companies feed into the automotive supply chain and these will therefore have the potential to diversify their products to meet the demands of the changing automotive sector.

The Annual Business Inquiry data allow us to review key strengths within each of the eight opportunity sectors in Staffordshire. 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 Staffordshire and the West Midlands.

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

Sector	Largest employment subsectors	Number of employees	Proportion of employees (S:WM)	Largest businesses subsectors	Number of businesses	Proportion of businesses (S:WM)
Public sector services	Human health activities	21,600	26%:27%	Social work activities	810	28%:33%
	Social work activities	15,000	18%:16%	Human health activities	800	28%:26%
	Primary education	13,100	16%:17%	Primary education	410	14%:13%
Transport, storage and communications	Land transport; transport via pipelines	10,000	42%:38%	Land transport; transport via pipelines	990	56%:51%
	Supporting and auxiliary transport activities; activities of travel agencies	8,300	35%:28%	Post and telecommunications	410	23%:26%
	Post and telecommunications	5,600	23%:32%	Supporting and auxiliary transport activities; activities of travel agencies	360	20%:21%
Manufacture of materials and fabricated metal products	Manufacture of machinery and equipment not elsewhere classified	8,700	39%:26%	Manufacture of fabricated metal products, except machinery and equipment	620	52%:56%
	Manufacture of fabricated metal products, except machinery and equipment	8,000	36%:44%	Manufacture of machinery and equipment not elsewhere classified	290	24%:23%
	Manufacture of electrical machinery and apparatus not elsewhere classified	2,600	12%:8%	Manufacture of electrical machinery and apparatus not elsewhere classified	110	9%:7%

Sector	Largest employment subsectors	Number of employees	Proportion of employees (S:WM)	Largest businesses subsectors	Number of businesses	Proportion of businesses (S:WM)
Construction	Building of complete construction or parts thereof, civil engineering	7,100	41%:47%	Building of complete construction or parts thereof, civil engineering	1,580	37%:39%
	Building installation	6,200	35%:33%	Building installation	1,360	32%:31%
	Building completion	3,700	21%:17%	Building completion	1,230	29%:27%
Farming, food and drink	Manufacture of other food products	1,900	31%:41%	Manufacture of other food products	40	33%:41%
	Manufacture of beverages	1,600	26%:9%	Manufacture of beverages	30	25%:15%
	Production, processing and preserving of meat and meat products	1,300	21%:27%	Production, processing and preserving of meat and meat products	20	17%:23%
Manufacture of non-metallic goods	Manufacture of concrete products for construction purposes	1,000	26%:11%	Manufacture of concrete products for construction purposes	30	21%:10%
	Cutting, shaping and finishing of stone	100	3%:3%	Cutting, shaping and finishing of stone	20	14%:13%
Manufacture of motor vehicles and transport	Manufacture of parts and accessories for motor vehicles and their engines	1,700	53%:41%	Manufacture of parts and accessories for motor vehicles and their engines	50	38%:42%
	Building and repairing of ships and boats	100	3%:11%	Building and repairing of ships and boats	30	23%:14%
Environmental goods and services	Manufacture of electricity, distribution and control apparatus	1,200	57%:51%	Manufacture of electricity, distribution and control apparatus	20	29%:24%

Source: Annual Business Inquiry. Table produced by WMRO.

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

- Social work activities
- Land transport; transport via pipelines
- Supporting and auxiliary transport activities, activities of travel agents
- Manufacture of machinery and equipment not elsewhere classified
- Manufacture of electrical machinery and apparatus not elsewhere classified
- Building installation
- Building completion
- Manufacture of beverages
- Manufacture of concrete products for construction purposes
- Manufacture of parts and accessories for motor vehicles and their engines
- Manufacture of electricity, distribution and control apparatus

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

- Human health
- Primary education
- Land transport; transport via pipelines
- Manufacture of machinery and equipment not elsewhere classified
- Manufacture of electrical machinery and apparatus not elsewhere classified
- Building installation
- Building completion
- Manufacture of beverages
- Manufacture of concrete products for construction purposes
- Cutting, shaping and finishing of stone
- Building and repairing of ships and boats
- Manufacture of electricity, distribution and control apparatus

5 Opportunities

5.1 Type of opportunities

The sub-national report¹³ 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 Staffordshire, we conducted a ranking exercise including the following elements:

1. **Sub-national ranking of sectoral opportunities¹⁴** - 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).

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

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

2. **Staffordshire 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. **Staffordshire 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:

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

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

Sector	Sub-national ranking	No. employees	No. employees ranking	No. businesses	No. businesses ranking	Overall ranking
Construction	3	17,500	4	4,280	1	5.5
Environmental goods and services	3	2,100	8	70	8	11
Farming, food and drink	6	6,200	5	120	7	12
Manufacture of materials and fabricated metal products	3	22,500	3	1,190	4	6.5
Manufacture of non-metallic mineral products	3	3,800	6	140	5	6.5
Manufacture of motor vehicles and transport	1	3,200	7	130	6	7.5
Public services	7	83,100	1	2,870	2	8.5
Transport storage and communications	7	24,000	2	1,780	3	9.5

Source: Annual Business Inquiry. Table prepared by WMRO.

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

- Construction
- Manufacture of materials and fabricated metal products
- Manufacture of non-metallic mineral products

It should be noted that over the past decade, the manufacturing of non-metallic mineral products sector (which is largely associated with the ceramics industry) has experienced significant job shedding. While opportunities for employment in the sector exist, these are likely to be associated with the diversification of the sector towards technologies which can take advantage of the area's historical lead in the ceramics sector.

During the recent recession, the construction sector (which has a higher proportion of employment locally than national averages) has also suffered from negative employment change. The future success of the sector is likely to be related to the ability of firms to take advantage of new opportunities related to the retrofitting of existing buildings and decarbonising processes in new construction projects.

5.3 Opportunities identified from the consultation

Table 3 below presents the sectors having the most employment and businesses in Staffordshire and potential low carbon opportunities identified through the consultation process.

Table 3: Potential low carbon opportunities for relevant sectors in Staffordshire

Sector	Low carbon opportunity
Construction	Development of environmentally friendly techniques for fabrication, including new building technologies and in the retrofitting of buildings
Manufacture of machinery and metal products	Less obvious link into low carbon opportunities, however given the supply chains for automotive industry, which are active particularly in southern Staffordshire, there may be potential to link into and diversify into emerging automotive technology
Transport	Decarbonising through the education of drivers etc. to be more fuel efficient and by using more efficient vehicles.
Public sector	The public sector should lead by example, promoting energy efficiency and new techniques in service delivery and buildings etc. and through promotion to the wider public

Source: Consultation with Staffordshire.

Finally, the consultation also identified the following specific low carbon opportunities in Staffordshire:

1. Some of the greatest opportunities for developing a low carbon economy in Staffordshire are likely to be tied into the **construction** industry locally, particularly around the retrofitting of buildings and the promotion of environmentally friendly building technology in new developments.
2. **Waste management** is a strong area for the Staffordshire economy, and there are good opportunities to develop these strengths further.
3. With a growing proportion of employment in **environmental technologies**, Staffordshire has a real potential to make its mark in developing the cluster.
4. **Power supply and generation** is a particular strength within the area, as is the diversification of the ceramics industry to be able to diversify into low carbon opportunities.

Low carbon opportunities are clearly seen as an opportunity to provide employment growth in the private sector, and may be able to offset some of the expected public sector job losses through Government austerity measures. Staffordshire has a strong manufacturing base (accounting for around 15% of employment) and important construction sector, and diversification into niche activities linked to low carbon will be important to the future survival of these employment bases.

6 Barriers

The sub-national research¹⁵ 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 that, although certain parts of Staffordshire have very well skilled workforces, there is a need to develop skills bases in Cannock Chase, Newcastle-under-Lyme and Tamworth in particular. This is particularly pronounced at the NVQ Level 3 equivalent "technical level" which is likely to be of great importance in servicing a future low carbon economy.

In order to overcome this issue, the local authority could lobby FE and HE providers to train more individuals with skills appropriate to such areas.

Finally, there is already a focus on local procurement where this is possible. As a priority outcome for Staffordshire, implications of climate change are also considered where appropriate in policy, service delivery and the general operation of the Council.

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

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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