



West Midlands
**Regional
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Low carbon economy in Stoke-on-Trent

January 2011

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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 Nicolas Jones at Stoke-on-Trent City 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 Stoke-on-Trent.

2.2 Research questions

The project focuses on answering the following research questions:

- Which of the opportunity sectors are best represented in Stoke-on-Trent?
- How many jobs are currently in these sectors? Would a low carbon economy secure these jobs or add new ones?
- Within Stoke-on-Trent 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 Stoke-on-Trent. 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 Stoke-on-Trent. 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 Stoke-on-Trent 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 in the local Stoke-on-Trent?
 - 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 Stoke-on-Trent 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 Stoke-on-Trent 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 growth⁴

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 2011-2015⁶

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 5 per 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 Stoke-on-Trent context

The Community Strategy for Stoke-on-Trent defines a sustainable community as one in which people want to live, now and in the future. This means they improve the quality of life for all whilst safeguarding the environment for future generations⁸.

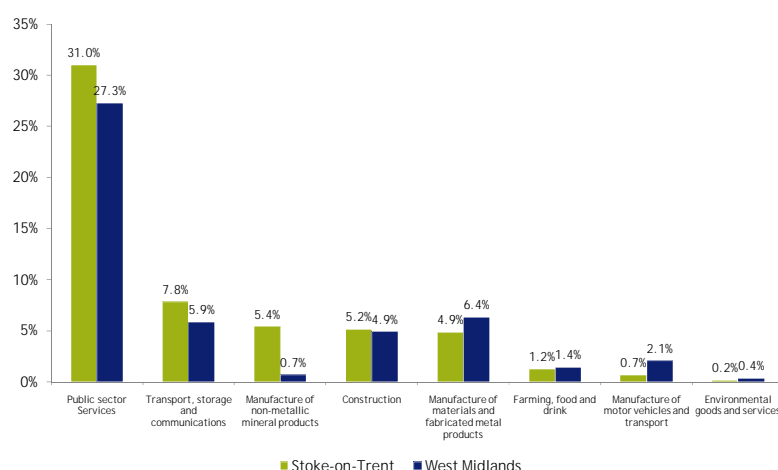
The strategy highlights the following activities encouraging a low carbon economy⁹:

- Improve energy efficiency across the city - including homes and business
- Creation of a culture of enterprise and innovation that makes Stoke-on-Trent a good place to do business
- Improve transportation networks and links
- Improve the amount of household waste recycled and composted
- Improve the way tackling per capita CO₂ emissions in the Stoke-on-Trent so these are maintained at current levels.

Figure 1 shows the employment in low carbon opportunity sectors in Stoke-on-Trent and the West Midlands. One in three people in Stoke-on-Trent work in public sector services.

Public sector services; transport, storage and communications; manufacture of non-metal mineral products and construction are the sectors in which Stoke-on-Trent 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

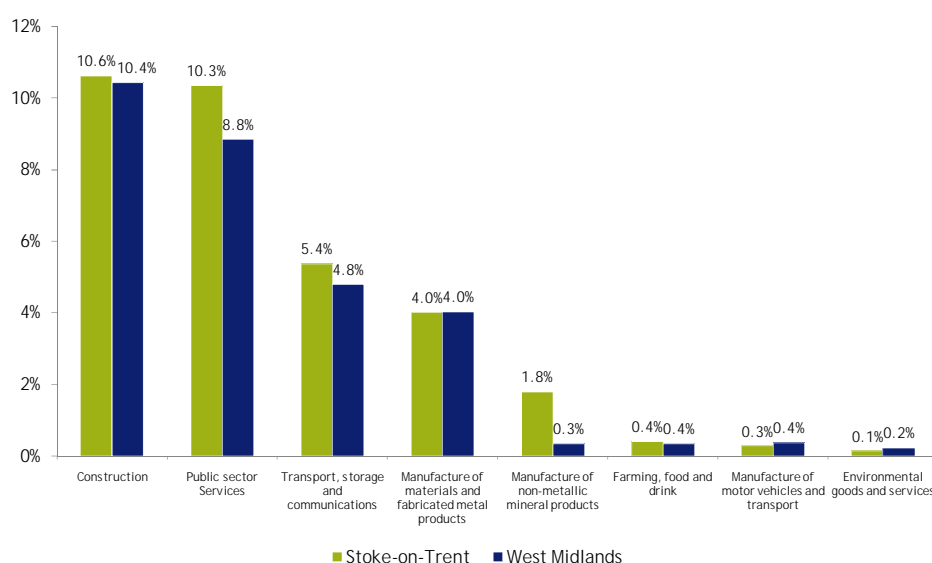
⁸ Stoke-on-Trent City Council (2008) Community Strategy: Delivery plan update 2008, p. 16

⁹ Ibid, p. 14

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 in Stoke-on-Trent.

Construction; public sector services; transport, storage and communications; and manufacture of non-metallic mineral products 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 opportunity sectors in Stoke-on-Trent and the West Midlands between 2003 and 2008. The sectors that have achieved an increase in employment in Stoke-on-Trent are:

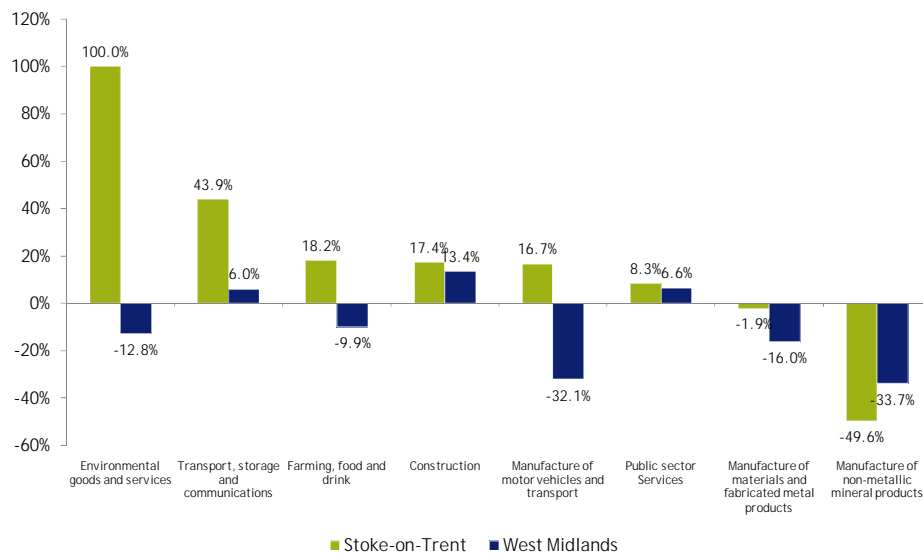
- Environmental goods and services
- Transport, storage and communications
- Farming, food and drink
- Construction
- Manufacture of motor vehicles and transport
- Public sector services

The sectors in which Stoke-on-Trent has a growth rate above the West Midlands one are:

- Environmental goods and services
- Transport, storage and communications

- Farming, food and drink
- Construction
- Manufacture of motor vehicles and transport
- Public sector services

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

In 2009, Stoke-on-Trent announced itself as the 'World Capital of Ceramics' since it has the world's greatest mix of¹⁰:

- Ceramic heritage
- Ceramic skills and expertise
- Breadth and depth of ceramic manufacturing capability
- Ceramics research and development
- World renowned ceramic brands
- Ceramic design and creativity

The Regional Skills Assessment 2009 identified local hot spots of employment in key business clusters. Interiors and lifestyle (particularly ceramics) was the cluster with a significant number of jobs in Stoke-on-Trent¹¹.

In addition, tourism and leisure was the cluster in which the number of jobs has grown particularly rapidly in Stoke-on-Trent.

The consultation identified the following initiatives already in place to support the development of the low carbon economy in Stoke-on-Trent:

- Low Carbon Development Group (LCIDG) chaired by Prof. Styles from Keele University
- Staffordshire University - RESCO Ceram Research
- Stoke-on-Trent City Council Low Carbon taskforce
- Build up - Econet North Staffordshire Chamber of Commerce and Industry
- Keele University - Keele Science Park

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

¹⁰ <http://www.advantagewm.co.uk/news-media-events/news/2009/10/stoke-on-trent-the-world-capital-of-ceramics.aspx>

¹¹ West Midlands Regional Observatory (2009) Regional Skills Assessment 2009 - skills issues in key business clusters, December 2009.

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	13,500	42%:27%	Social work activities	280	37%:33%
	Social work activities	5,500	17%:16%	Human health activities	200	27%:26%
	Primary education	4,000	12%:17%	Primary education	80	11%:13%
Transport, storage and communications	Supporting and auxiliary transport activities; activities of travel agencies	4,400	54:28%	Land transport; transport via pipelines	180	45%:51%
	Post and telecommunications	2,000	24%:32%	Post and telecommunications	120	30%:26%
	Land transport; transport via pipelines	1,800	22:38%	Supporting and auxiliary transport activities; activities of travel agencies	100	25%:21%
Manufacture of non-metallic goods	Manufacture of ceramic household and ornamental articles	4,200	74%:27%	Manufacture of ceramic household and ornamental articles	60	46%:11%
Construction	Building of complete construction or parts thereof, civil engineering	2,300	43%:47%	Building installation	280	36%:31%
	Building completion	1,600	30%:17%	Building of complete construction or parts thereof, civil engineering	240	31%:39%
	Building installation	1,400	26%:33%	Building completion	240	31%:27%

Sector	Largest employment subsectors	Number of employees	Proportion of employees (S:WM)	Largest businesses subsectors	Number of businesses	Proportion of businesses (S:WM)
Manufacture of materials and fabricated metal products	Manufacture of machinery and equipment not elsewhere classified	2,500	50%:26%	Manufacture of fabricated metal products, except machinery and equipment	160	52%:56%
	Manufacture of fabricated metal products, except machinery and equipment	1,800	36%:44%	Manufacture of machinery and equipment not elsewhere classified	80	26%:23%
Farming, food and drink	No detailed statistics available ¹²	-	-	No detailed statistics available ¹²	-	-
Manufacture of motor vehicles and transport	No detailed statistics available ¹²	-	-	No detailed statistics available ¹²	-	-
Environmental goods and services	No detailed statistics available ¹²	-	-	No detailed statistics available ¹²	-	-

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 Stoke-on-Trent and with a higher employment proportion than the West Midlands one are:

- Human health activities
- Social work activities
- Supporting and auxiliary transport activities; activities of travel agencies
- Manufacture of ceramic household and ornamental articles
- Building completion
- Manufacture of machinery and equipment not elsewhere classified

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

- Human health activities
- Social work activities
- Post and telecommunications
- Supporting and auxiliary transport activities; activities of travel agencies
- Manufacture of ceramic household and ornamental articles
- Building Installation
- Building completion
- Manufacture of machinery and equipment not elsewhere classified

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 Stoke-on-Trent, 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 Ibid, pp. 19-21

2. **Stoke-on-Trent 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. **Stoke-on-Trent 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 Stoke-on-Trent (2008)

Sector	Sub-national ranking	No. employees	No. employees ranking	No. businesses	No. businesses ranking	Overall ranking
Construction	3	5,400	4	770	1	5.5
Environmental goods and services	3	200	8	10	8	11
Farming, food and drink	6	1,300	6	30	6	12
Manufacture of materials and fabricated metal products	3	5,100	5	290	4	7.5
Manufacture of non-metallic mineral products	1	5,700	3	130	5	5

Sector	Sub-national ranking	No. employees	No. employees ranking	No. businesses	No. businesses ranking	Overall ranking
Manufacture of motor vehicles and transport	1	700	7	20	7	8
Public services	7	32,500	1	750	2	8.5
Transport storage and communications	7	8,200	2	390	3	9.5

Source: Annual Business Inquiry. Table prepared by WMRO.

The sectors with the greatest opportunities in Stoke-on-Trent, highlighted in green, are:

- Manufacture of non-metallic mineral products
- Construction

5.3 Opportunities identified from the consultation

5.3.1 Sectors with low carbon opportunities

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

Table 3: Potential low carbon opportunities for relevant sectors in Stoke-on-Trent

Sector	Low carbon opportunity
Public Sector	Growth in deployment of renewable energy e.g. photovoltaics
	Development of best practice through pilot schemes and supporting private sector initiatives
Ceramics / Manufacture	Transference of skills and technologies from the ceramics industry to anaerobic digestion (managing liquid clay is very close to managing organic soup). Already been successfully implemented in Germany
	Building material technologies, specifically heavy clay sector, for new development and retrofit.
	Manufacture of smart meters
	Diversification for example window frame manufacturer into photovoltaic panel assembly

Sector	Low carbon opportunity
Distribution & logistics	Carbon neutral logistic centre (Blue Planet) not in use at the moment
	Large rail hub infrastructure unused, potential for distribution network
Business services	Skills development, for example skilled labour is required for the installation of renewable technology

Source: Consultation with Stoke-on-Trent.

Finally, the consultation also identified the following specific low carbon opportunities in Stoke-on-Trent:

1. Currently focusing on exploring the synergies between the ceramics supply chain and the anaerobic digestion supply chain, resource (waste) recovery and biomass supply chain and utilisation (such as growth and processing of biomass material and burning biomass for heat).
2. Learn from the recently announced Low Carbon Zones (such as Manchester) with the aim of becoming one in the future
3. Support future economic development with secure (low carbon) energy supplies. Stoke-on-Trent is identifying the opportunity for deployment of a district energy infrastructure within the city. Stoke-on-Trent currently has two successful Community Energy Saving Programmes (CESP) funded projects going forward. Finally community heating schemes will also be considered.

5.3.2 Low carbon economy and skills

Security of energy supply has been mentioned as a business continuity priority in Stoke-on-Trent. Linked to the need to future-proof energy supplies, is the need to future-proof the infrastructure - the buildings, roads and services against future climate change.

Skills will be needed to build adaptive capacity to a changing climate and these skills will need to be complementary to those required to develop a low carbon economy. The need for adaptation should provide opportunities for businesses based in the UK and those exporting their expertise abroad.

The government recognises that further research on the adaptation skills is needed in the long term, which will require a response by the government, schools, universities and professional associations. This is due to the unprecedented scale and pace of change in areas such as planning. The government is working with the industry to gather knowledge about skills capacity.

Led by the Enterprise and Skills Directorate an agreed skills strategy linked to the plan to develop a low carbon business base, create green jobs, and link to the local and regional Universities will be strengthened and the inward investment team would be fully involved in the business development and emerging skill gaps identified. Local supply of relevant training and development would be co-ordinated through the Centre of Refurbishment Excellence (CoRE), and the Jobs Enterprise and Training teams.

5.3.3 Low carbon economy and public sector procurement

Whilst there are strict guidelines and rules that govern public sector procurement, the council in Stoke-on-Trent could work to engage more with SMEs and local suppliers in procurement tenders.

This could be carried out by simplifying the procurement process (where appropriate), and also offering to engage more with local suppliers on procurement tenders - by arranging 'Meet the Buyer' events.

In addition, the council could seek to consider the embodied carbon in a service or product that is being supplied. A good example of this is a recent tender for hospital food in North Staffordshire. In awarding a new tender the hospital trust reduced its carbon footprint associated with the delivery of food by 40 per cent over the previous supplier¹⁵. This was achieved in the context of the NHS 'Good Corporate Citizen' strategy and the NHS Carbon Reduction Strategy. In that Strategy, it was calculated that procurement was the single largest factor in the NHS carbon footprint, responsible for 60 per cent of the CO₂ emissions.

¹⁵ Institute for Environment, Sustainability and Regeneration (2010) 'Carbon Footprint Implications for the Sourcing of Hospital Food in North Staffordshire', Staffordshire University

6 Barriers

The sub-national research¹⁶ 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 Stoke-on-Trent:

- Lack of training centres and courses, and consequently lack of skilled labour
- Lack of broad awareness about sustainability in companies, leading to lack of an integrated approach to low carbon (only quick wins, no strategic view)
- Lack of capital investment
- General market failure and in particular the housing market failure - house prices are very low and developers do not build Low Carbon dwellings as return on investment (ROI) would be too small
- Misunderstanding or unwillingness to engage with the Emission Trading Scheme (ETS)
- Inability to raise finance

¹⁶ West Midlands Regional Observatory (2010) The Low Carbon Economy in the West Midlands, WMRO, UK

The local authority can take actions to overcome these barriers. The consultation identified that Stoke-on-Trent could:

- Lead by example
- Engage with the EU2020 Agenda
- Disseminate digestible and relevant information to the local industry
- Raise finance

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

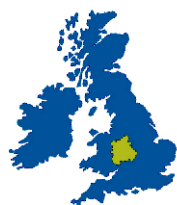
Appendix B: Consultation questionnaire

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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