Profile of Birmingham's Low Carbon Sector











The Low Carbon sector

Introduction

This profile is one of a suite of seven covering key High Growth Sectors in Birmingham. The profiles were compiled in 2011 and go beyond analysis of the available datasets, to enable us to understand how the sectors support the local economy now, and how we can develop their potential for the future. This has been achieved by integrating data analysis with intelligence from sector experts drawn from businesses, research institutions and networks.

Each of the profiles presents statistical information, along with case studies, an analysis of the sector today, and future challenges and opportunities.

The seven sectors are:

- Business and Professional Services
- Financial Services
- Creative, Media and Digital
- Medical Technology
- Transport Technologies
- Low Carbon
- Advanced Manufacturing



Gas Street Basin

Sector overview

The low carbon sector provides technologies and services to support the shift to the low carbon, resource efficient economy required to meet Britain's target of reducing greenhouse gas emissions by at least 80% below 1990 levels by 2050. Achievement of these targets requires fundamental changes in the way in which we generate and use energy. The move to a low carbon economy is therefore a UK priority for economic growth and job creation, both as part of the short term economic recovery and as an element of sustained growth over the longer term.

Low carbon sub-sectors

- Low Carbon and Renewable Energy supply
- Low Carbon Buildings
- Carbon Capture and Storage
- Low Carbon transport, fuels and vehicles
- Energy efficient production processes
- Low carbon resource / waste management
- Low carbon finance and professional services

200+ firms in the low carbon sector

4,200+ employed in the sector

27% employment growth between 2005 and 2010 Birmingham already has a burgeoning low carbon technology sector, including manufacturing businesses, service providers, leading edge university research and recent inward investors, with particular strengths in areas such as low carbon and electric vehicles, fuel cells, biofuels, decentralised energy and low carbon buildings. Just as Birmingham was at the heart of the industrial revolution, the city is now committed to being at the heart of the low carbon economy.

With a target of reducing the city's CO2 emissions by 60% by 2026, Birmingham has established several pioneering new initiatives which are accelerating development of the local carbon sector in the city, including in areas such as district energy, electric vehicles and housing retrofit. Birmingham is also developing major new plans to transform the city's energy infrastructure, incorporating decentralised and renewable energy, smart grids, low carbon buildings, energy and resource efficiency and low carbon transport, which will help drive future sector growth.

Juwi Renewable Energies



In 2010, the German renewable energy company Juwi, announced that it had chosen Birmingham as the company's new base in the UK. The new UK firm, Juwi Renewable Energies, is located near Birmingham Airport. The company is planning to work with land owners, farmers, communities and owners of large roof-tops to help them set up solar power plants. Juwi plans to create 60 jobs by 2012. The firm decided to make the move into the UK market following the introduction of the Feed-in tariffs scheme in 2010, which was modelled on a similar scheme in Germany which kick-started wide-spread adoption of photovoltaics among households, farms and businesses.

Daniel Parsons, Juwi Solar business development manager, said "The UK has natural potential similar to Germany and also an incentive system which provides the opportunity for businesses and the country to achieve its renewable energy targets." He said it was possible to replicate the success of the German experience with solar power in the UK. "The ambitious renewable energy targets have to be achieved somehow and we believe it has to be something different to just CO2 capture and offshore wind parks. As regards costs, solar PV is due to be on a par to offshore wind in two years time. "

The firm expects strong growth in the field over the coming years. If conditions remain positive, it expects to create around 60 jobs in the fields of project development, site acquisition, and engineering as well as sales and marketing and other office functions.

Birmingham's established track record

Birmingham has established strengths in traditional parts of the environmental technology industries, such as water and wastewater treatment, air pollution control, contaminated land remediation, environmental consultancy, environmental engineering, energy management and waste management. More recent developments in the sector in the city reflect increasingly strong policy drivers for carbon reduction, and are listed overleaf.

"It was important to be in the middle of the country, have very good road access and also, as we are a German company, to have good international airport links to Germany... additionally Birmingham is a great city with good support for business."

Daniel Parsons, Juwi Solar

Recent sector developments

- Low carbon vehicle technologies, linked to Birmingham's long history in automotive manufacture and research, and initiatives such as the CABLED and project, and Plugged In Places, a demonstration and charging point and infrastructure project, both of which support the expansion of the market for electric vehicles in Birmingham and the West Midlands. There are also clusters of low carbon vehicle technology businesses based around Birmingham, including Jaguar Land Rover, Zytek, Penso Ricardo, SAIC, MIRA and WMG. This is designed to accelerate the development of low carbon vehicles, with the aim of full scale manufacture by 2013/14.
- Rapid recent growth in microgeneration/renewable energy, such as the installation of photovoltaics, solar thermal and energy efficiency technologies. Growth has been driven by the Government's Feed-in-Tariff introduced in 2010 and pioneering projects such as Birmingham Energy Savers which aims to invest £100m to refurbish 15,000 homes across the city using technologies such as photovoltaics and energy efficiency measures. The city is part of a large scale European funded project (€45m) to support the development of smart grid technology linked to small scale generation.
- Leading edge low carbon and renewable energy research, including in hydrogen fuel cell technology, such as Birmingham University's Centre for Hydrogen and Fuel Cell Research, bioenergy research at the European Bioenergy Research Institute at Aston University, using photonics to develop

"We are proud to partner the City Council to manage Birmingham's waste arisings allowing the Authority to be one of the top 10 performing Councils in the UK in diverting waste away from landfill.

We look forward to continuing to assist Birmingham City Council as it delivers its ambitious plans to further reduce carbon emissions, develop innovative district heating grids, support inward 'green' investment and build a thriving low carbon green economy."

Steve Mitchell

Managing Director, Veolia Environmental Services (Birmingham) Ltd

Energy Recovery in Birmingham: Veolia

Veolia Environmental Services ('Veolia') is the leading recycling and waste management company in the UK providing sustainable waste management solutions to local communities, commercial and industrial sectors. It is known for its integrated waste management solutions which include refuse collection, recycling, street cleansing, composting, landscaping, solid & hazardous waste treatment.

In Birmingham, Veolia is the City Council's partner operating a 25 year waste management, recycling & recovery services contract. Across the city Veolia operate an integrated network of waste recovery facilities, transfer stations and household recycling centres. Veolia's operations centre on the Energy Recovery Facility in Tyseley, which converts 350,000 tonnes of Birmingham's residual domestic waste into energy suitable for powering over 40,000 houses.







efficient LEDs and lighting technologies at Birmingham Science Park Aston, and Birmingham City University's Faculty of Technology, Engineering and the Environment (TEE).

- District heating and combined heat and power facilities, including city centre CHP schemes being developed by the Birmingham District Energy Company Limited (BDEC) - a joint venture between Birmingham City Council and COFELY District Energy (formerly Utilicom).
- Recycling and waste management infrastructure, including the energy recovery facility at Tyseley built and run by Veoelia Environmental Ltd, which converts 350,000 tonnes of Birmingham's rubbish each year into electricity; the Smurfit Kappa Recycling paper mill in Nechells Birmingham; and networks of materials recovery facilities and recycling centres. Together this waste management infrastructure is helping to achieve Birmingham's targets of ensuring that no more than 50% of the city's waste is sent to landfill by 2015, and zero waste is sent to landfill by 2026.
- Low carbon engineering skills, including the work of many Birmingham based engineering consultancies such as, Atkins, Hyder Consulting, Black & Veatch, URS/Scott Wilson, Capita Symonds, Gifford, Mott MacDonald, Environ, RPS, WSP, Waterman, White Young Green.

The business base

As with many industries, the low carbon sector is predominantly populated by very small firms. However, the sector in Birmingham has a greater proportion of larger firms than the UK as a whole (14 per cent employ more than 10 people, compared to 11 per cent in the UK as a whole). The sector's larger firms are predominantly involved in waste, recycling and water utility activities. One firm in particular - Severn Trent - has until recently had a sizeable operation in the city, but at the time of writing its headquarters was being transferred to Coventry.

The overall size of the sector is relatively small in terms of business and employment numbers - 211 firms employ 4,237 people - but these figures represent a rise of 20% and 27% respectively compared to 2005. So, while small, the sector is growing quickly, reflecting the increasing importance of low carbon technology and related policies.



Over the last five years, Birmingham has seen a net increase in business births of 33%, similar to that across the UK as a whole. The sector's business stock in the city mostly comprises independently owned, single site firms (86% and 90% of the sector's firms respectively), reflecting the predominance of very small enterprises.

£400m+ contribution to the city's economy

6%

of firms are foreignowned In 2010, the low carbon sector contributed £417m Gross Value Added (GVA) to Birmingham's economy (note: GVA figures still include Severn Trent). By comparison, the sector represented 0.3 per cent of the economy in terms of firm numbers, and 0.9 per cent by employment.

The table below shows ten of the biggest firms in the sector by workforce, excluding the larger waste and utility companies. The list includes environmental consultancies (Ecorys, URS), recycling operations and alternative energy/energy efficiency firms.

Largest firms in the Low Carbon sector*	
Ecorys UK Ltd	182
Lodge Cottrell Ltd	52
D & P Textile Co. Ltd	30
Wood Waste Recycling Ltd	22
Eastwood Air Conditioning Ltd	20
Recycling Management Ltd	20
Posative Energy Solutions Ltd	20
URS Corporation Ltd	14
First Environment Ltd	14
Energy Savers	7
*excluding large waste and utility companies	

Areas for future growth

There are significant opportunities for the sector in Birmingham, driven by clear policies to reduce greenhouse gas emissions, improve energy efficiency, address fuel poverty and strengthen energy security. To achieve the UK's climate change targets, each unit of economic output in Britain will need to be produced emitting, on average, one tenth of the carbon dioxide emitted today.

In Birmingham, there is a strong economic imperative for developing the city's energy infrastructure. The city as a whole spends £1.3bn on gas and electrical energy each year, most of which is imported. With oil prices expected to at least double in the next 20 years, this economic leakage will grow significantly unless the city sees major investments in its energy infrastructure; increases renewable and decentralised energy; and influences low carbon developments in buildings, transport and the way we use energy and resources.





Low Carbon Businesses in Birmingham by Employment

Business location

The businesses in the low carbon sector (in terms of company and employment numbers) are primarily clustered around Birmingham city centre; to its north in Aston, where there is a concentration of light industry and good links to the motorway network; and to the East on the industrial estates of Tyseley.



Combined Heat & Power Engine, ICC

The European Bioenergy Research Institute, Aston University

The EBRI was established at Aston with the aim of becoming a leading international centre of bioenergy technology research, working with industrial partners to develop and test technologies in fields such as pyrolysis, gasification, biogas, bio-hydrogen and algal-based biofuels. EBRI is building world class bioenergy technology testing and demonstration facilities, to be completed by 2012, which will enable industrial partners to test and develop technologies and biofuel feedstocks.

EBRI works with many industrial partners including businesses in and around Birmingham such as Severn Trent, E.ON, Utilicom and Veolia, as well as academic partners such as Birmingham University and Birmingham City University.

Applications include decentralised bio-fuel production for low carbon vehicles, housing and urban developments.

EBRI was established in 2008 and currently has 30 staff, including PhD, Post Doc and administrative staff, with plans to expand to 70 staff and £10m turnover over the next few years.

Led by Professor Andreas Hornung, EBRI is located in Birmingham because of the city's strong ambitions on the low carbon agenda, combined with strengths and benefits such as:

- The city's strong skills base on low carbon technologies
- Proximity to large markets and many industrial partners
- Lower cost base compared with SE England and other parts of Western Europe
- Availability of industrial premises and development land

To date, EBRI has been university and EU funded and plans to generate future income from technology licensing and selling of bioenergy, including supplying via decentralised energy generation facilities to be developed across Birmingham. Biomass will produce green energy which will feed into the national grid and provide a significant proportion of energy for the city (reducing Birmingham's reliance on imported energy).







A huge potential market

According to 2009 analysis commissioned by the government, the *global* market for low carbon and environmental goods and services was estimated as being worth £3tn in 2007/8 and is forecast to grow to £4tn by 2016. The *UK* market was worth over £106bn in 2007/8 and already employs an estimated 880,000 people directly or through its supply chains. This is forecast to grow to more than 1 million employees by 2015. Parliament's Environmental Audit Committee estimated in 2011 that the UK needs to invest £0.5 trillion in green infrastructure to meet statutory targets to tackle climate change and increase energy from renewable sources and Ofgem estimates that £200bn of investment will be needed by 2020 to upgrade our outdated energy assets and to prepare for new decentralised power

plants connected to the grid. By the second half of the decade, annual investment in the UK energy system is expected to reach £25bn.

A range of initiatives from the last and current UK governments are being introduced to accelerate the expansion of the low carbon sector and the shift towards a low carbon economy -



Gas powered CHP engine delivered to ICC

A new world of renewable energy

New World Solar Installations was established in 2006. It supplies and installs renewable energy systems such as photovoltaics, solar thermal, CHP boilers, ground source and air source heat, for domestic, public sector, housing association and commercial clients.

New World Solar has worked with partners (such as Birmingham City Council, Family Housing and the Thomas Vale Group) on pioneering low carbon housing retrofit projects such as the award-winning



Summerfields ECO project and the Birmingham Energy Savers project. These initiatives have used the Feed in Tariff to generate revenues as well as providing free energy to households. The company has completed over 1,000 installations nationwide and now has 23 staff and turnover of £2m. With growth in the UK microgeneration market, the company is now developing its activities to supply and assemble microgeneration systems, helping to developing strong local low carbon supply chains. Ambitious plans for the development of the Birmingham Energy Savers programme (with a further 15,000 homes to be retrofitted over the next 3 years) will continue to drive the city's microgeneration sector.

"Birmingham is a great place for businesses in the low carbon economy. Thanks to Birmingham City Council's strong commitment to carbon reduction, housing retrofit and local supply chains, opportunities for renewable energy and microgeneration, businesses have been accelerated"

"The city has plenty of skilled people with electrical, plumbing and construction skills, and with the help of local colleges, microgeneration businesses are able to access a growing pool of people with the right skills"

Mark Clemson, New World Solar including the Feed in Tariff, the Renewable Heat Incentive (to be launched later in 2011), Green Deal (to be launched in 2012), the Green Investment Bank and electricity market reform.

Birmingham is already at the leading edge of actions in the UK to develop low carbon housing and retrofit, with pioneering programmes such as Birmingham Energy Savers, as well as progress on low carbon vehicles. Businesses in the city are therefore well placed to capitalise on opportunities in many parts of the low carbon sector.

The Birmingham Fuel Cells Group - University of Birmingham

The Fuel Cells Group (Centre for Hydrogen and Fuel Cell Research) at the University of Birmingham was formed in 2000 by Professor Kevin Kendall and colleagues, and is internationally recognised for its dynamism and expertise in Fuel Cell Technologies. It is also part of the Birmingham Science City Research Alliance initiative, the Midlands Energy Consortium with Loughborough and Nottingham Universities, and has been awarded £5.5m by Research Councils UK to run a Doctoral Training Centre in Hydrogen, Fuel Cells and their Applications, the first of its kind in the UK.

The Centre covers hydrogen production, storage, utilisation and economics, and its focus includes two main fuel cell activities: solid oxide fuel cells and proton exchange membrane fuel cells. It provides Research and Development, applications and demonstrations of Hydrogen and Fuel Cell systems, and has numerous publications and patents in Fuel Cell Technologies. The Centre has state of the art facilities and is home to England's first hydrogen filling station (launched in 2008) and hydrogen-powered house (launched in 2008); a hydrogen fuel cell Combined Heat and Power; and a fleet of hydrogen fuel cell vehicles. It is also involved in projects in Birmingham such as CABLED (Coventry and Birmingham Low Emissions Demonstration).



The Fuel Cells Group also focuses on the implementation of a Hydrogen and Fuel Cell Supply Chain in the West Midlands and the UK, working with 60 SMEs to develop and manufacture hydrogen fuel cell components.

Future opportunities

There is a strong and growing low carbon market, both nationally and internationally, which has the potential to provide many commercial opportunities for Birmingham's businesses. Opportunities will include the eventual decentralisation of the energy grid; ambitious programmes to promote low carbon and energy efficient buildings; and the development of low carbon vehicles and an integrated transport infrastructure.

Of course, the Birmingham economy is not the only one to see the enormous potential of the low carbon sector, so competition is likely to be fierce. And, at present, the sector in Birmingham is relatively small (although its growth in recent years has been substantial). Notwithstanding the challenges it faces, Birmingham's low carbon sector has number of strengths which should enable it to reap the benefits of a growing low carbon economy:

- A business base with clear strengths in a number of areas, such as low carbon buildings, vehicle technologies, waste management and recycling
- Key areas of research excellence within its universities, such as biofuel and fuel cells, drawn together by initiatives such as Birmingham Science City
- A strong local commitment to the low carbon agenda, demonstrated by innovative local projects backed by the city council and other agencies
- A strong local skills base and training provision through local universities and colleges

Further Information

Reporting and analysis by Consulting Inplace and <u>URSUS Consulting</u>. Unless otherwise specified, the statistical data in this profile relates to 2010 figures, based on a bespoke sector definition determined by Birmingham City Council for the purposes of this research. Data comes from <u>TBR</u> and may therefore differ from ONS and other business datasets.

Copies of all seven High Growth Sector profiles can be downloaded from: <u>www.birmingham.gov.uk/birminghameconomy</u>

Further information about this profile can be obtained from:

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