



European Union
European Structural
and Investment Funds



Low Carbon Energy Plan

Summary Report

March 2016



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Introduction

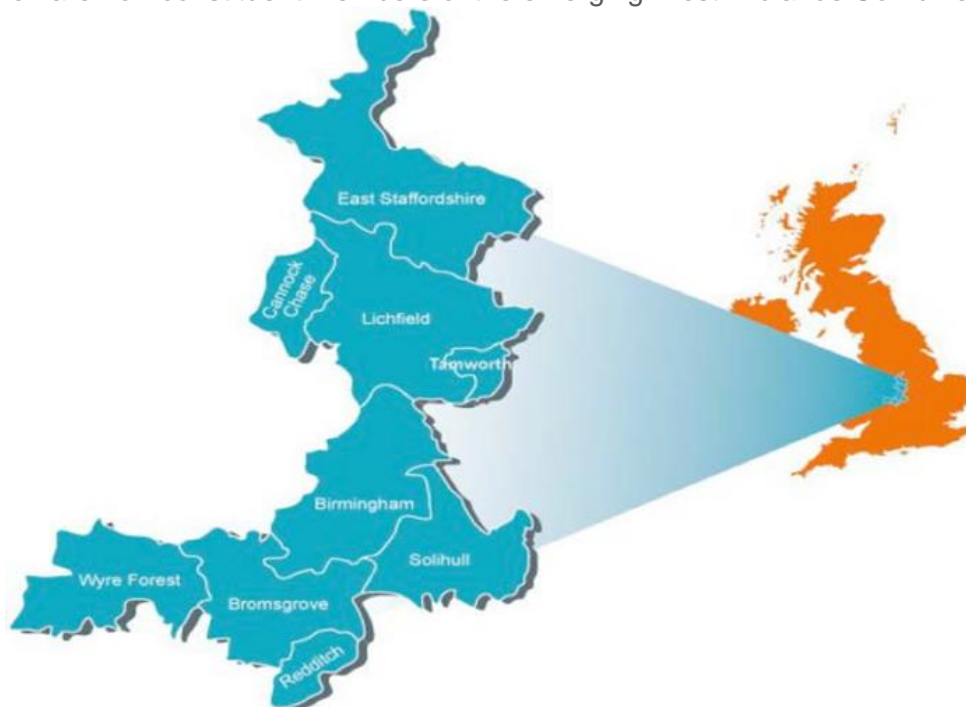
The Greater Birmingham and Solihull Local Enterprise Partnership's (GBSLEP) Low Carbon Energy Plan (LCEP) helps to unlock investment that will deliver significant environmental benefits and economic growth in the area. It presents a vision, priority areas and key activity for the use of funding. It also sets out the overall governance for delivering the LCEP.

The Plan provides the required framework for directing investment of funding related to low carbon energy including the EU Strategic Infrastructure Funds (ESIF), in particular Priority 4e, and other UK funds such as the Local Growth Fund.

The Plan also relates to the Sustainable Urban Development Strategy in support of the HS2 Growth Strategy and will be embedded in future LEP strategies, particularly the refresh of the Strategic Economic Plan (SEP).

The GBS LEP is a business-led partnership of the public and private sectors. Its mission is simple: to create jobs and grow the economy – and in doing so raise the quality of life for all the LEP's population. Low carbon energy can make a strong contribution to that mission.

This LCEP applies to the 9 GBS LEP local authorities and it has potential to influence cross-border projects which impact on partner LEPs surrounding GBS. The GBS LEP is one of three LEPs which are non-constituent members of the emerging West Midlands Combined Authority.



The LCEP has been developed through research and stakeholder consultation to understand the priorities for action based on current strengths and opportunities, existing plans and required strategies across the GBS LEP.

The LEP has also developed a Low Carbon Transport Plan (LCTP) covering the detail on objectives related to transport vehicles, mobility and refuelling. The LCEP refers to the LCTP where relevant for further detail.

The methodology and detailed evidence base to support this document are contained in the LCEP full report's appendices.

LCEP Context & Vision

The GBS LEP has a population of 1.96 million people which is expected to grow by 4.9% in the next five years to 2020. The area has 67,000 businesses, 918,000 jobs and contributes £35.4bn to the national economy. The LEP has a stated aim of achieving a net increase of at least £8.25bn GVA by 2020¹.

The LEP's Strategic Economic Plan (SEP) set a vision to re-establish Greater Birmingham's role as the major driver of the UK economy outside London through programmes addressing three pillars: **Business, People and Place**.

A strong contribution to these three pillars can be achieved through the transition to a modern, decarbonised and decentralised energy system that this LCEP outlines.

In a wider context, there is global consensus that human activities are raising the concentration of greenhouse gases (carbon emissions) in the atmosphere to levels that will drive catastrophic climate change if not curbed. The primary cause of carbon emissions is use of fossil fuels to provide energy for power, heat and transport. Demand for energy has grown significantly over the last century. Nationally, the UK government has stated among its priorities for the energy sector "Promoting action in the EU and internationally to maintain energy security and mitigate dangerous climate change."²

The Committee on Climate Change report on setting the UK's fifth carbon budget sets priorities for the short to medium term as:

- Energy efficiency in buildings, transport vehicles and in industry
- More than halving the carbon intensity of UK power generation by 2030
- Electrification of heat and transport by 2030
- Widespread deployment of existing commercialised low carbon energy solutions

The GBS LEP area is a significant source of carbon emissions, through its demand for power, heat and transport for the population and the economy. Population and economic growth will drive further carbon emissions unless specific actions are taken to put the area onto a sustainable growth path with the adoption of low carbon solutions for power, heat and transport.

If actions are not taken to adopt low carbon energy in the area, the local economy could become less competitive nationally and internationally and more susceptible to energy-related problems. This could also affect the population as a whole through public services and transport difficulties. The LCEP therefore suggests the following vision:

The GBS LEP vision is to become a leading low carbon economy through the modernisation, decarbonisation and decentralisation of its energy, waste and transport systems and the buildings that support its businesses, people and places.

¹ GBS LEP (2013) Strategy for Growth

² <https://www.gov.uk/government/organisations/department-of-energy-climate-change/about>

The recommended priorities and activities of the LCEP play to the GBS LEP’s existing economic strengths and its major intellectual energy assets which include:

<p>Private</p>	<p>1,835 business, 33,405 jobs and £4.5n GVA in the GBS LEP low carbon sector. The renewable energy subsector in the GBS area had sales of £1528.2m in 2014/15 and grew over 10% over the last three years</p> <p>Manufacturing and fuel production activities with solar PV and hydro sub-sectors ahead of English regions</p> <p>Five key growth sectors which can drive economic growth</p>
<p>Research</p>	<p>Nationally leading research expertise through the Energy Research Accelerator (ERA) lead by six Midlands universities, including University of Birmingham and Aston University, with investment of £180m from Government and Industry for innovation in energy research.</p> <p>Home to the Energy Technologies Institute, Energy Systems Catapult and UK Climate KIC, European Bioenergy Research Institute and Birmingham Energy Institute.</p>
<p>Public</p>	<p>Significant plans in development for investment in heat networks, low carbon transport infrastructure and integrating energy opportunities with waste strategies.</p>

The Energy Roundtable of Birmingham’s Green Commission is developing a concept of an *Energy Capital* to help deliver this vision, with the clear purpose of linking social and environmental prosperity to major investment for R&D and manufacturing that will produce sector growth in skills, jobs and GVA

The key opportunities for delivering this energy transition and the LEP’s mission include:

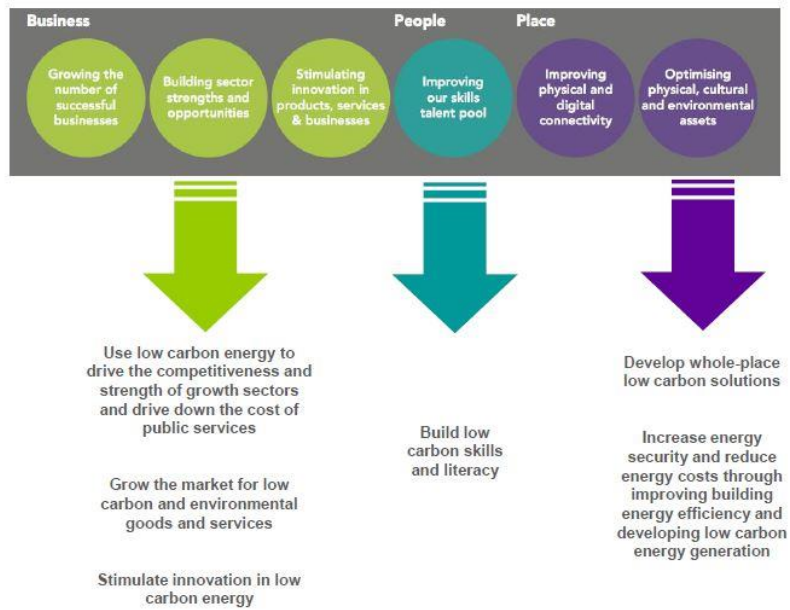
- Using the significant redevelopment across the area such as HS2, UK Central and Birmingham City Centre Enterprise Zone to develop whole place low carbon solutions with zero or low carbon energy infrastructure
- Exploiting the strengths in growth sectors and the strong manufacturing base to address key low carbon challenges
- Collaboration between the public sector, research institutions and local large energy-user organisations with investors for real world demonstration & commercialisation
- Devolution and the emerging WMCA for greater financial levers and to simplify regional collaboration on energy

Finally, the GBS LEP has an annual energy bill of approximately £3.4 billion, almost 10% of its GVA output. The majority of this expenditure leaves the area and so a more decentralised system could recapture that spend and circulate it within the local economy whilst contributing significantly to skills and jobs growth, as well as social and environmental prosperity. The LCEP therefore recommends the following carbon and energy generation targets:

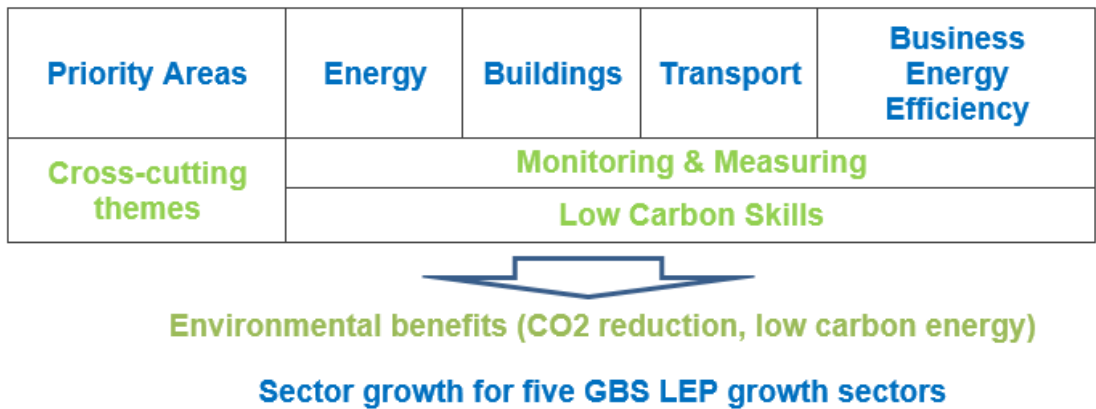
By 2020 the GBS LEP will have reduced its CO₂ emissions by 36% on a 2005 baseline.

Local renewables generate 35% of all electricity consumed and renewable heat represents 12-14% of all heat consumed.

The link between the Low Carbon Energy Plan vision builds on the GBS LEP's strategy for growth:



To achieve its vision, the LCEP outlines four 'Priority Areas' and two 'Cross-cutting themes' with key actions and activities within each area. Full details are provided in Sections 4 and 5 of the Full Report and a further section on the funding sources most appropriate for each area is provided in Section 6.



GBS Energy & Carbon Context

GBS LEP Energy Consumption and Generation

Energy generation for power, heat and transport is the primary source of carbon emissions through the burning of fossil fuels including coal, oil, gas, diesel and petrol. The key drivers for the energy sector currently are the need to:

- Decarbonise the energy supply
- Upgrade the distribution infrastructure to allow distributed energy generation to be connected
- Find over £1bn of capital investment to fund replacement of aging fossil fuel and nuclear generating equipment with low carbon, modern equipment
- Ensure power supply meets demand whilst this transition occurs

The UK also has targets for renewables and energy efficiency:

	EU '20:20:20' Target	UK EU Renewable Energy Directive Target
2020	20% from renewables and 27% energy from efficiency improvements	15% from renewables
2030	At least 27% from renewables and 20% from energy efficiency improvements	No target

GBS energy use is split across power, heat and transport as below:

Headline figures for GBS energy consumption

Overall Consumption	Between 2005-13, the total energy consumption across all fuel types has reduced by 18.1% from 46,156 GWh in 2005 to 37,789 GWh in 2013 Heat is the primary use of energy consumed (50.1%), followed by transport (31.3%) and power (18.6%).
Power	Energy for power has reduced by 13.4% between 2005 – 13 2.7% of electricity consumed was from renewable sources in 2014
Heat	Energy for heat has reduced by 23.6% between 2005 – 13 0.02% of heat consumed was from renewable sources in 2013.
Transport	Energy for transport area has reduced by 10.8% between 2005 and 2013 2.1% of transport fuels was from renewable sources in 2013

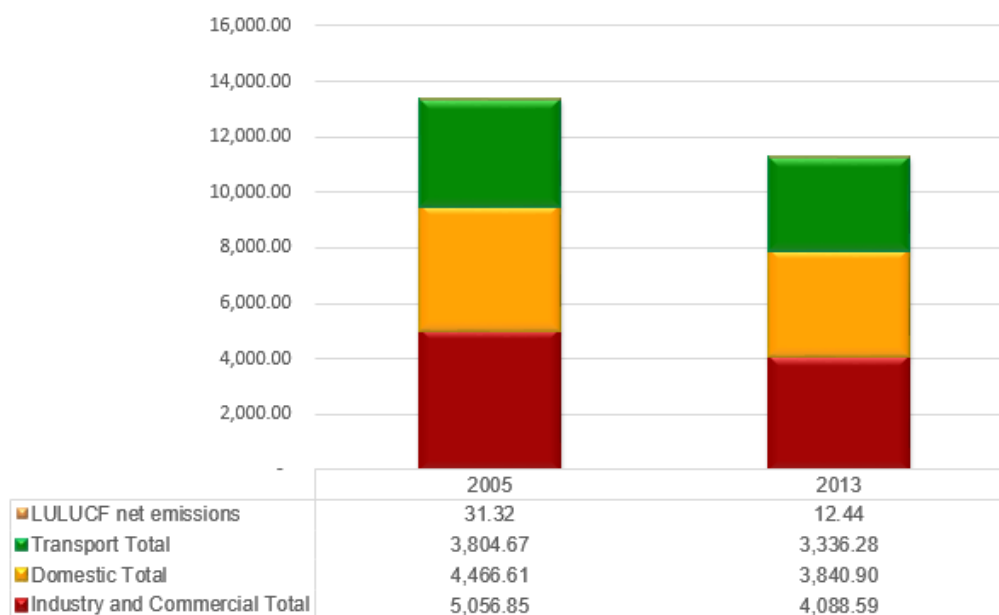
GBS LEP Carbon Emissions

The data on carbon emission is provided annually (with a two year delay) by DECC at the local authority level going back to 2005. There are currently no collective targets related to carbon emissions at the GBS LEP level but a key requirement of ESIF is for GBS LEP to set a target. Stakeholders felt that a 2005 base year was most appropriate and that the scope of emissions for the GBS LEP should be wider than just those within direct LA influence. The wider sub-sectors are covered in the headline figures below.

Headline figures for GBS carbon emissions 2005 – 13

Overall Emissions	GBS area emissions reduced by 15.6% or 2081.2 ktCO ₂ to 11,278 ktCO ₂ in 2013
Industrial and commercial	Reduced by 19.1% (968.3 ktCO ₂)
Domestic	Reduced by 14% (625.7 ktCO ₂)
Transport	Reduced by 12.3% (468.4 ktCO ₂)
Land Use, Land Use Change and Forestry	Reduced by 60.3% (18.76 ktCO ₂)

GBS area full carbon emissions by sector



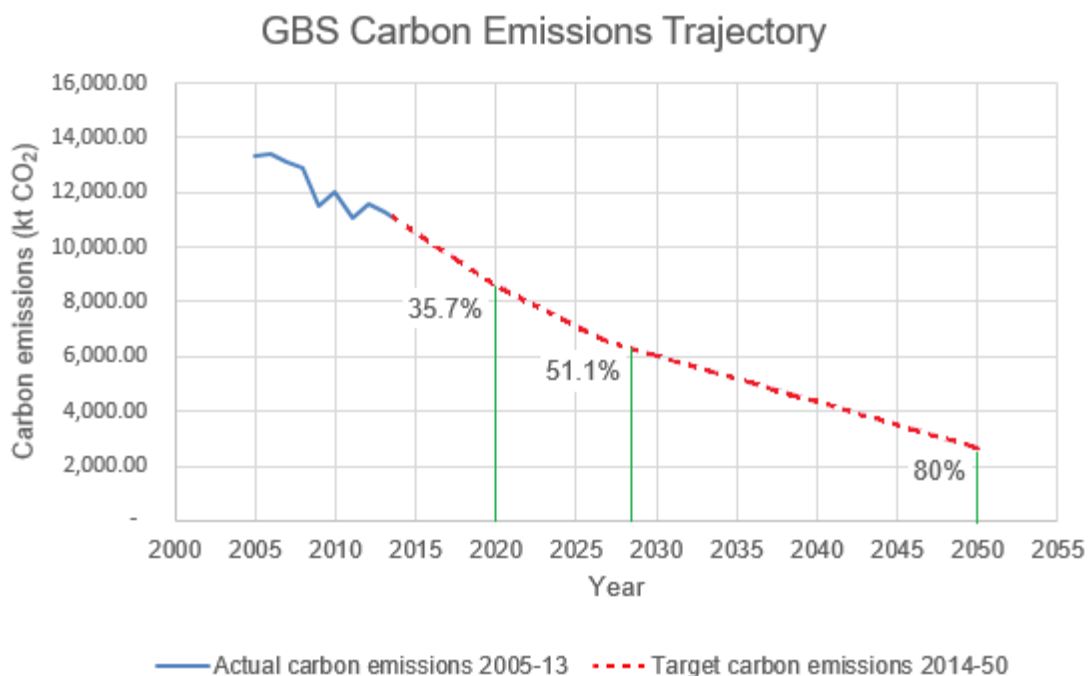
Carbon Target

It is recommended that an ambitious carbon emissions reduction target is adopted for the GBS LEP, above the non-traded sector target stated by the Committee on Climate Change with a 2005 baseline. Key reasons for this include:

- Lack of sub-national carbon emissions statistics available before 2005
- Birmingham has been nominated a Clean Zone so that all atmospheric emissions must be reduced
- The need to create a 'steady state' environment to encourage investment in low carbon energy projects at a local level and to counter the significant changes in energy policy at central government level
- An ambitious target would attract investors and key businesses that would enable low carbon projects to be delivered successfully.

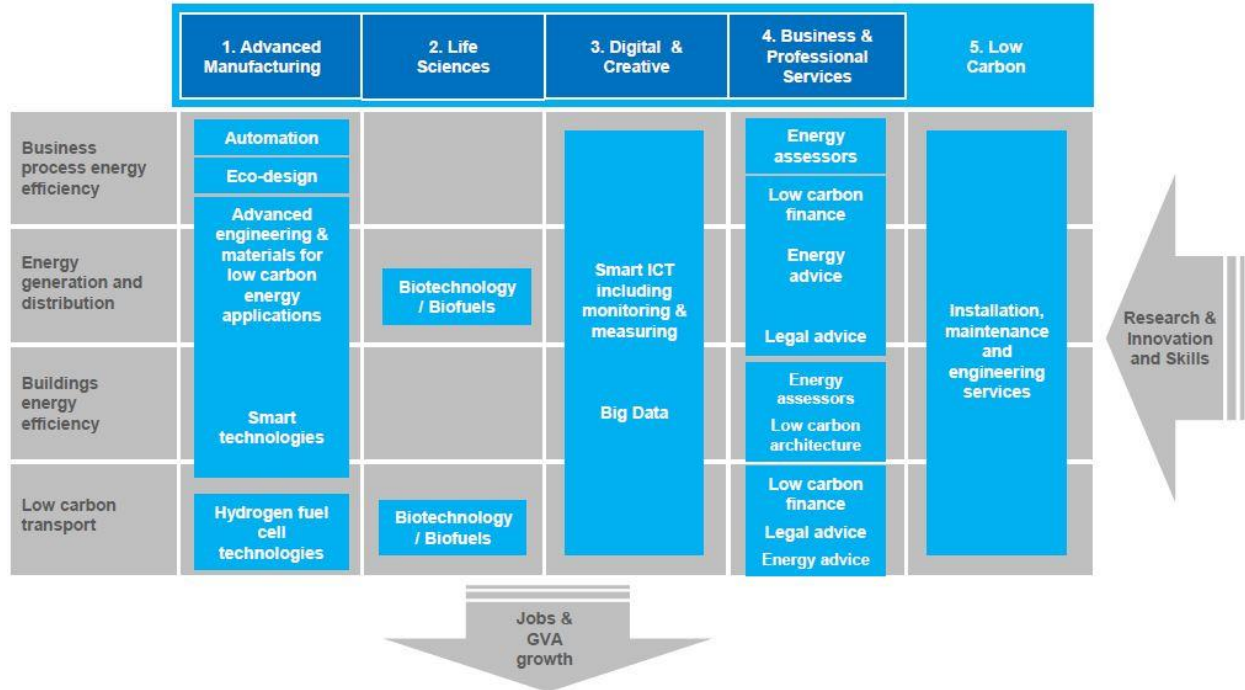
The following targets are suggested for adoption by the LEP:

Baseline year, dataset and value	Target reduction and year	Target reduction in CO ₂ (baseline to target year)
Baseline year: 2005 Emissions dataset: DECC sub-national dataset (Jul 2015) – Full CO ₂ emissions GBS baseline value: 13,359 ktCO ₂	35.7% by 2020	4,771,034 tCO ₂
	51.1% by 2027	6,819,331 tCO ₂



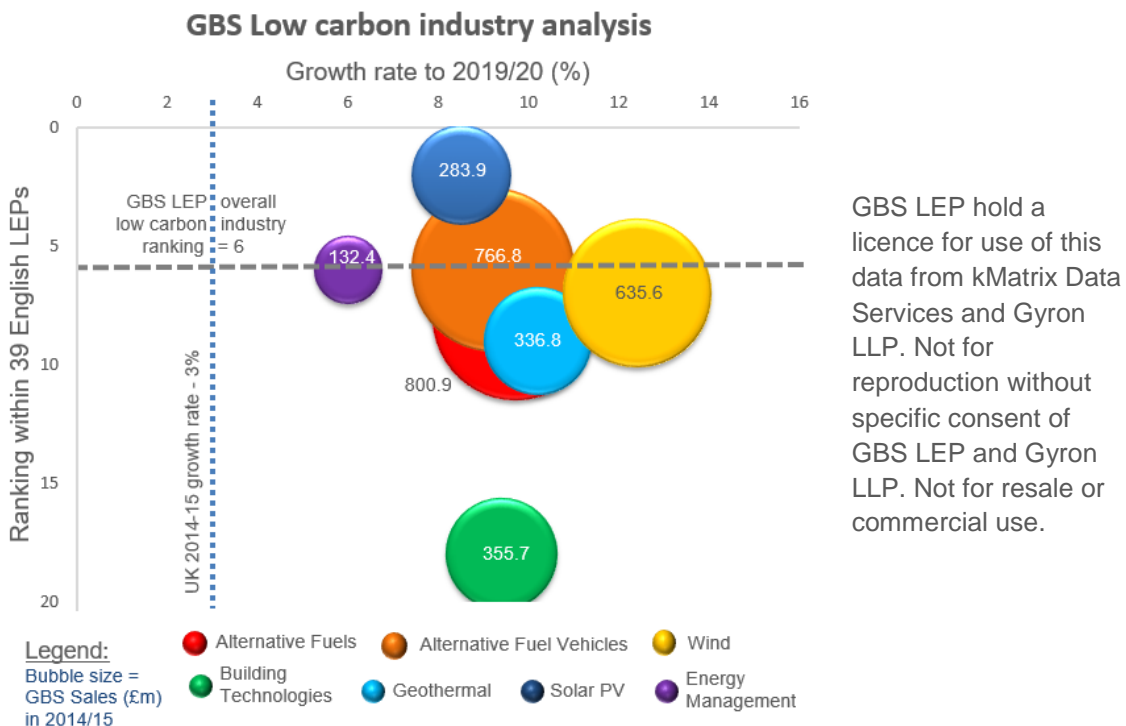
GBS LEP Low Carbon Economy

The Strategy for Growth identifies five 'high growth, high value add' sectors and the Strategic Economic Plan (SEP) sets out a programme that will support these sectors to grow. The activity in the LCEP can contribute to growth across all five sectors.



Low carbon industry performance 2014/15

In 2014/15 the low carbon industry in the GBS area comprised around 1,835 companies employing over 33,405 people and generating £4,500m sales for the area. The industry represents 11% of the area's Gross Domestic Product (GDP). The key sectors, the ranking and growth forecasts to 2020 are represented in the diagram below. GBS has particular sector strengths in solar PV and alternative fuel vehicles.



Research and Commercialisation assets in the GBS LEP

The GBS area is home to nationally significant research institutes with a high degree of relevance to the energy sector. These form a key part of developing the strategic context for the GBS LEP and helping to realise the ambitions under the *Energy Capital* concept, with a focus on research and development of energy innovation and commercialisation of technologies.



Birmingham hosts the UK's Energy Systems Catapult (ESC) which aims to enable the whole-system transformation necessary for the UK to meet its energy policy goals by 2050. It is taking a multi-vector approach including electricity, heat and combustion of gas and, importantly focusses on using its insights to help address consumer, policy maker and technology requirements.

The Energy Research Accelerator (ERA) is a partnership between six leading Midlands UK universities including University of Birmingham and Aston University, as well as the British Geological Survey. The ERA is tackling some of the biggest challenges facing the global economy with research initially divided into three themes, 'Thermal', 'Integrated' and 'Geo-energy' research.



The European Bioenergy Research Institute (EBRI) is home to both academic and industry facing teams that aim to accelerate the commercial development of emerging bioenergy and supporting technologies. EBRI's research and technology capabilities include advanced thermal technologies and biological conversion processes. Allied with this is expertise in energy systems, supply chains, techno-economic analysis, transport logistics, analytics, engines and power systems.

The Birmingham Energy Institute is driving technology innovation and developing the thinking required to develop sustainable energy solutions in transport, electricity and heat supply. Three key strands of research are led through the Birmingham Centres for Energy Storage, Nuclear Education & Research and Fuel Cell & Hydrogen Research. Its Policy Commission works on future government policy requirements.



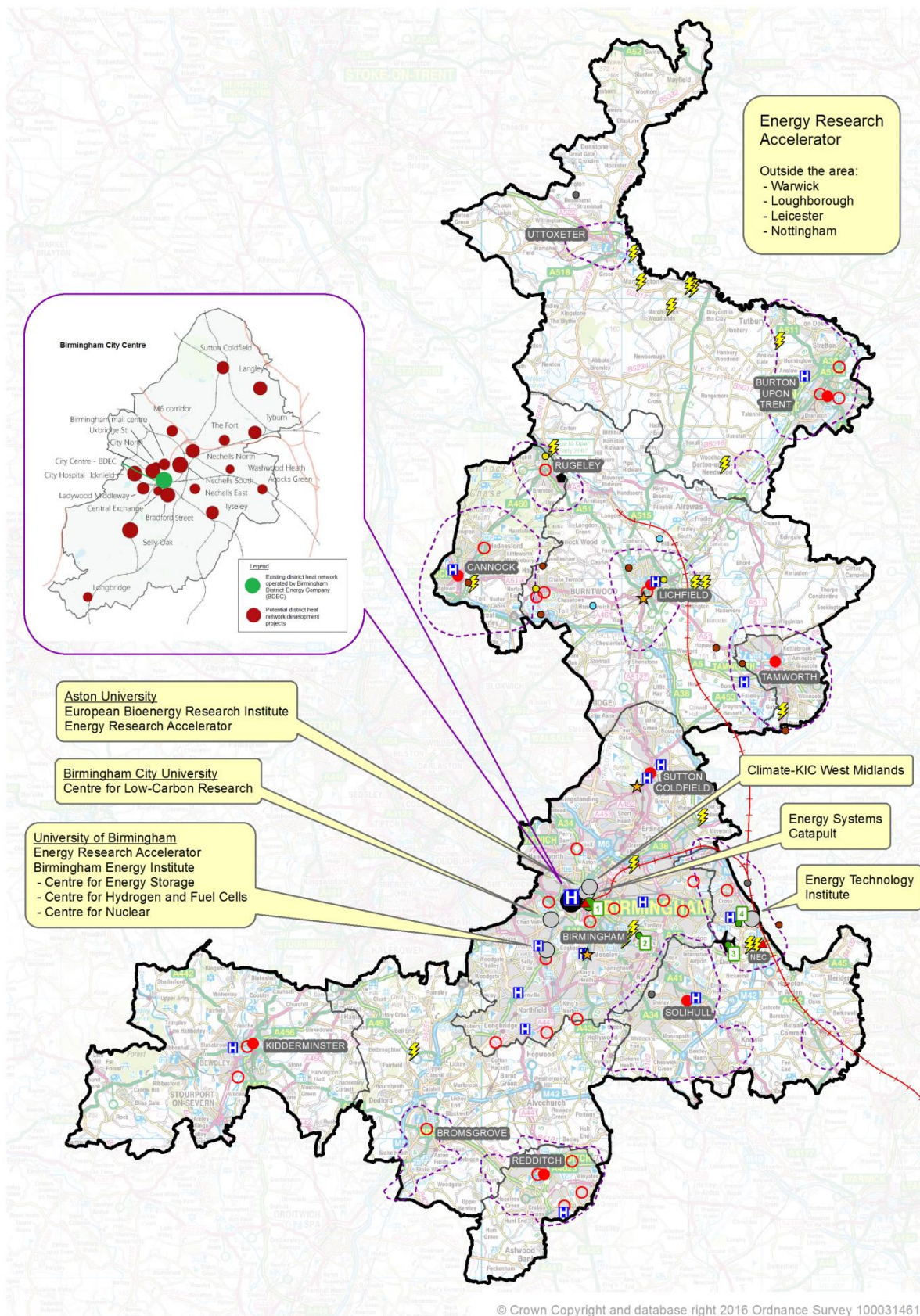
The Energy Technologies Institute (ETI) is a public-private partnership between global energy and engineering companies and the UK Government. Its role is to act as a conduit between academia, industry and the government to accelerate the development of low carbon technologies. It makes targeted commercial investments in nine technology programmes across the heat, power, transport energy subsectors and the infrastructure that links them.

The European Institute of Innovation and Technology's Climate Knowledge and Innovation Community (KIC) is Europe's largest public-private innovation partnership focused on climate change. Climate KIC West Midlands offers grants, financing and support, networking, professional education and supportive European projects to address climate change.










GBS LEP Energy Assets

The map of the GBS area below highlights key energy assets of an intellectual and physical nature and key energy projects and developments currently at the feasibility or early development stage.






Assets Map Key



Existing and potential energy generation sites

-  Low carbon energy generation sites
-  Rugeley Power Station
-  Crematoria
-  Waste treatment sites
-  Waste water treatment sites
-  Landfill sites
-  Heat network development projects





Key energy usage sites

-  Regional centre
-  Major towns
-  Hospitals



Intellectual assets

-  Universities/research institutes
-  Community renewables support organisations





Key developments

-  Key infrastructure development projects
-  HS2 stations
-  HS2 line
-  Major regeneration/growth projects

Other

-  LEP boundary
-  District boundaries

Key infrastructure development projects

-  City Centre Enterprise Zone and Midland Metro extensions
-  Tyseley Environmental Enterprise District
-  Airport expansion project
-  UK Central

Priority 1: Energy

The GBS context and strengths for energy include:

- Local assets include 234,186 MWs of installed renewable power generation plant including nearly 46MW of Solar PV and over 30MW of energy from waste
- The renewable energy subsector in the GBS area had sales of £1528.2m in 2014/15 and grew over 10% over the last three years
- The GBS LEP's solar PV subsector is ranked second overall in England (after London) and its hydro subsector is ranked overall 3rd
- Fuel production is a more significant activity in the GBS area than elsewhere in England
- Manufacturing is also a strength

Projects and opportunities that may contribute to increasing renewable energy in the short and long term emerged from the research:

- The Energy Capital concept should be developed to attract inward investment that will be mutually beneficial to achieve the LEP's economic and energy visions
- GBS LEP heat network studies and a potential future LEP wide delivery vehicle
- Tyseley Energy Park
- Expansions and new connections of commercial buildings to the Birmingham District Energy Company's (BDEC) existing central Birmingham heat network
- Connection of the European Bioenergy Research Institute (EBRI) renewable energy generation asset to BDEC
- Energy storage expertise through Birmingham Energy Institute
- Planned Solar PV installations at the NEC
- Major building developments in plan including the HS2 station, UK Central, Birmingham International Airport expansion and changes in plan to local hospitals
- Local Authority waste management contracts may lend themselves to decentralised energy generation opportunities
- Assets already in place and projects in plan for electric vehicle re-charging points

National activities and policies which contribute to production of low carbon and renewable energy include:

- The UK is on target to meet its renewable power generation target in the short term provided that national plans to decarbonise the traded sector, especially the power sector, are successful.
- Energy storage (of electricity, heat, bio-fuels and low carbon gases), allied with energy management and local and grid-connected smart-grids are expected to be key technologies to address gaps in the national and local achievement against targets.
- Renewable energy incentives including Feed In Tariff, Renewable Heat Incentive, Contracts for Difference and National Grid's demand response schemes;
- The Large Combustion Plants Directive is driving the industry to accelerate closedown or retrofit of remaining coal-based power stations;
- The EU-Emissions Trading Scheme is operated across Europe to incentivise large energy users to reduce their energy usage. 45% of the EU's carbon emissions are covered by this scheme which aims to reduce the emissions of this group by 21% from a 2005 base by 2020.

Barriers identified in stakeholder feedback include:

- Capital expenditure constraints
- Understanding and accessing funding

- Planning policy and procedure red tape
- Digression and withdrawal of national incentive schemes for renewable energy technologies
- Distribution networks' capacity for connecting new renewable electricity and biogas generation sites, requiring strategic co-ordination with Western Power Distribution and National Grid
- Skilled engineering resource to implement some systems

Gaps that need to be addressed include:

- There is a national shortfall in renewable heat generation
- The GBS area has a high level of unexploited renewable energy capacity according to a report by SQW for Telford & Wrekin Council³ in 2011. The report concludes that although the capacity for renewable energy is available, market conditions including wholesale energy prices, availability of financial incentives to help fund capital outlay, low carbon energy technology prices and local planning policy will dictate how much actually gets implemented.
- The GBS area is a net importer of renewable electricity. This is because the renewable power known to be generated locally as a percentage of the total electricity consumed locally (2.7%), is smaller than renewable power representation in the electricity supplied from renewable sources in the DECC supplier-provided data (3.9%).
- There is no data available on the level of energy storage in the GBS area outside National Grid implementations, including one in the West Midlands.
- The low carbon industry analysis recognised gaps for GBS. Notably the overall low carbon industry ranking fell a position in the last year and likewise several key subsectors have dropped in ranking.

Case study: Minworth Biomethane Gas to Grid Plant

In 2014, Severn Trent Water started to inject biomethane produced from its waste treatment of sludge into the National Grid at Minworth, which processes sewage from around 1.7m people in the wider Birmingham area. 16 Anaerobic Digesters (AD) onsite generate 80,000 m³ of biogas per day and this is passed through a Combined Heat and Power plant to generate power for the treatment works and heat to feed back into the AD processes. The process represents a carbon saving of 29,000 tCO₂ per year and is sufficient to heat more than 4,000 homes.



Environmental Outcomes

Indicator	Baseline year and figures(s)	Target and year	Gap
Total power and heat consumed	2014 = tbc (awaiting updated DECC figures) (Power = 8635 GWh in 2014, Heat = 18,936.4 GWh in 2013)	2020 – local renewable electricity generation is equal to 35% of all electricity consumed and renewable heat is 12-14% of all heat consumed.	35% of total power and 13% of heat consumed in 2020 less 2014 achievement. (Note interaction of 20% reduction targets for energy efficiency)
Renewable power and heat generation	2014 = Local renewable electricity generation is 234,2GWh - about 2.7%. Renewable heat generated from non-domestic installations = 2.2GWh – less than 1%		Estimate on 2013 data: Power: 1734.34 MWh Heat: 1966.77 MWh

³https://www.herefordshire.gov.uk/media/7395463/Renewable_Energy_Capacity_Study_for_the_West_Midlands.pdf

Sector Growth Outcomes

Based on the research completed, the potential sector growth outcome is summarised below. This shows the subsectors with the largest sales in the GBS area and a UK growth rate exceeding 5.5% in 2014/15, with the potential contribution they could make to sector growth (through sales) in the GBS area by 2020. This growth can be supported by addressing any gaps identified in the research. Local strengths in the low carbon industry should be exploited, including solar PV and hydro subsectors. Matching local and wider market opportunities to these subsectors will increase sector growth outcomes

Sub-sector	Sales 2014/15	UK Growth forecast to 2020	Potential contribution to sector growth by 2020
Wind	£635.5m	12.4%	£78.8m
Alternative Fuels*	£800.9m	9.7%	£77.7m
Geothermal	£336.8m	10.2%	£34.4
Solar PV	£284m	8.5%	£24.3m

**Alternative fuels includes transport fuels, therefore this forecast crosses both Energy and Transport priorities*

Energy Priority Actions for the GBS LEP

- 1. Increase the generation of low carbon heat and power including the key technologies in the UK Renewable Energy Roadmap**
- 2. Maximise the local use of low carbon heat and power**
- 3. Stimulate innovation in low carbon heat and power**

Further detail on actions and activity is contained within the table below and the LCEP Full Report.

LCEP Priority Theme and Actions	Activities	Partners	Time-frame	Potential Outputs			Priority	Potential funding sources						
				Environmental		Sector Growth		ESIF	Other EU Funding	UK Funding	Equity and Loan Finance	Tax and Energy Incentives	Alternative Finance Models	Self-finance
				CO ₂ Reduction	Low Carbon Energy									
A) Energy														
A1) Increase the generation of low carbon heat and power including the key technologies in the UK Renewable Energy Roadmap	A1a) Provide support to deliver known large-scale low carbon heat and power generation projects including those related to district heat network studies that prove feasible.	Private + public developers, regulators, professional services, ES Catapult, low carbon industry	to 2020	H	H	M	H							
	A1b) Provide support to deliver known small-scale low carbon heat and power generation including community energy schemes that prove feasible.	Private, public + Community sector, low carbon industry	to 2020	M	M	H	H	✓					✓	✓
	A1c) Provide support to deliver known energy distribution projects (private wire / pipe and district heat networks) that prove feasible to facilitate the local generation and consumption of low carbon energy.	Private, public + community sector, regulators, professional services, ES Catapult, WPD and National Grid Gas Ltd, low carbon industry	to 2020	M	M	M	M	✓		✓	✓		✓	✓
	A1d) Convert all energy centres connected to district heat networks to low carbon and renewable fuel sources, including securing supply.	Private, public + community sector, regulators, professional services, ES Catapult, WPD and National Grid Gas Ltd, low carbon industry	to 2027	H	H	M	H	✓		✓	✓		✓	✓
	A1e) Increase the commercialisation of near to market low carbon heat and power generation technologies.	Universities, Growth Hub, low carbon industry, community sector, professional services	to 2020	M	M	M	M	✓	✓	✓	✓			✓
A2) Maximise local use of low carbon heat and power	A2a) Increase local energy storage.	Private developers, low carbon industry, local stakeholders, DNO, regulators	to 2020	H	H	L	H	✓			✓	✓	✓	✓
	A2b) Develop local smart grids with energy storage and controls.	Private sector project developers, low carbon industry	to 2027	H	H	M	H	✓			✓	✓	✓	✓
	A2c) Facilitate local stakeholder participation in the demand response markets to unlock more low carbon generation investments.	ESCos, demand response aggregators / low carbon industry e.g. EnerNOC, Limejump and Open Energi, local businesses	to 2020	M	M	M	M					✓	✓	✓
	A2d) Increase the commercialisation of near to market low carbon smart grid, energy controls and management and storage technologies	Universities, Growth Hub, low carbon industry, community sector, professional services	to 2020	M	M	M	M	✓	✓	✓	✓			✓
A3) Stimulate innovation in low carbon heat and power	A3a) Maximise local collaboration between the research base and businesses to address market needs for low carbon heat and power and maximising local use thereof.	Universities, Growth Hub and low carbon industry	to 2027	L	L	M	H	✓	✓	✓				✓
	A3b) Stimulate innovation by key growth sectors in low carbon energy generation solutions.	Universities, Growth Hub and high growth sectors	to 2027	L	L	L	M	✓	✓	✓				✓

Priority 2: Buildings

The GBS context and strengths for energy include:

- The energy efficiency of public sector-owned housing stock is above the national average and the EPC-rating of the stock has improved between 2013-15.
- The low carbon building technologies (building energy efficiency) subsector in the GBS area had sales of £355.8m in 2014/15 and this sector grew at over 6.4% in the 2014/15 period.
- The closely allied energy management subsector (monitoring and measuring) had sales of £132.4m in 2014/15 and grew at 4.1% in 2014/15.
- The GBS area's building technologies subsector is ranked 18th overall in England whilst the energy management subsector is ranked 6th overall.

Projects and opportunities that may contribute to increasing the energy efficiency of existing buildings in the short and long term emerged from the research:

- Retrofit of energy efficiency lighting to local University estates
- Retrofit of energy efficient lighting to local hospitals
- Plans across several other parts of the GBS area to continue retrofitting existing housing stock, building on work already delivered under the Green Deal, ECO and other programmes.

The following new development projects present opportunities for low carbon design incorporating building technologies and energy management systems:

- Birmingham Curzon HS2
- UK Central
- Enterprise Zone
- Enterprise Belt in Southern Staffordshire, North Worcestershire and Solihull

National activities and policies which contribute to production of low carbon and renewable energy include:

National policy and activity will also have an impact on energy efficiency in buildings:

- Ongoing national ECO scheme to 2017 and a planned replacement scheme
- Introduction of new requirements for landlords under the Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015:
 - Domestic tenants' rights to make energy efficiency improvements to a property from 1st April 2016 with landlord consent not to be unreasonably withheld
 - Introduction of minimum building energy efficiency EPC rating of Band E for certain domestic properties to be newly let or to have a tenancy renewed from April 2018.

Barriers identified in stakeholder feedback include:

- Capital and operating expenditure constraints
- Understanding and accessing funding
- Changes to national policy regarding Green Deal and the ECO
- Planning policy and procedure red tape
- Skilled engineering resource to implement some systems

Gaps that need to be addressed include:

- The low carbon industry analysis recognised a gap, with GBS area’s overall ranking for the building technologies subsector being 18th in England, whilst for most other subsectors it is ranked 6th.
- The domestic housing stock in the GBS area is significantly worse than the national average, with 5% more housing falling into EPC Bands E and F. This is largely in private sector housing, as public sector-owned domestic property has been the recipient of significant funding over the last 5-10 years.

Case study: Solihull Community Housing

Solihull Community Housing (SCH) won the National Home Improvement Council’s ‘Energy Efficiency in Communities’ Award for a £25m project in Chelmsley Wood. During 2014-15, SCH partnered with British Gas to complete the installation of external cladding to 31 high rise buildings fuelled by district heating in 23 of the buildings.



The biomass system is much more efficient and controllable than the storage heaters and homes are now more economical to heat. Residents are also able to track their pre-payment credit and energy usage on a wall mounted meter. It is hoped this will help them to manage their energy use more effectively.

SCH is able to claim renewable heat incentive payments for the heat generated by the biomass boilers, providing a regular income to support the on-going running costs.

This work is supported by an energy information and support programme to ensure that residents make the most of the energy efficiency measures installed.

Environmental Outcomes

Indicator	Baseline year and figures(s)	Target and year	Gap
Total energy consumed	2005 = 46,156.1 GWh	Reduce total energy consumption by 20% by 2020 and 27% by 2027 through energy efficiency programmes for buildings	2020 - 36,924.9 GWh 2027 - 33,693.98 GWh
Building energy efficiency – domestic and non-domestic properties.	2013 – average EPC rating (number) – to be developed for domestic and non-domestic properties	20% improvement in average EPC number by 2020, equating to equivalent tCO ₂ e reduction	To be developed
Building energy efficiency – public buildings	2013 –using information from DEC’s – to be developed.	20% reduction in primary energy usage (kWh) of public buildings by 2020 equating to equivalent tCO ₂ e reduction	To be developed
Building energy efficiency – domestic properties	2013 - 31% of Domestic EPCs in Bands E and F	2027 – Match national average (currently 26% of EPCs in Bands E & F)	To be developed

Sector Growth Outcomes

Based on the research completed, the potential sector growth outcome is summarised below. This shows the relevant subsectors' sales in the GBS area and UK growth rate in 2014/15, with the potential contribution they could make to sector growth (through sales) in the GBS area by 2020. This growth can be supported by addressing any gaps identified in the research.

Sub-sector	Sales 2014/15	UK Growth forecast to 2020	Potential contribution to sector growth by 2020
Building Technologies	£355.8m	9.4%	£33.5m
Energy Management *	£132.4m	6%	£7.9m

** Energy management includes solutions for business processes; therefore this forecast crosses both Buildings and Business Process Energy Efficiency priorities*

Projects that aim to demonstrate exemplar building retrofit or new build technologies with integrated energy management systems may stimulate collaboration and innovation within the local industry and maximise sector growth and environmental outcomes.

Building Priority Actions for the GBS LEP

1. Improve the energy efficiency of buildings
2. Stimulate Innovation in low carbon energy efficiency for buildings

Further detail on actions and activity is contained within the table below and the LCEP Full Report

LCEP Priority Theme and Actions	Activities	Partners	Time-frame	Potential Outputs			Priority	Potential funding sources						
				Environmental		Sector Growth		ESIF	Other EU Funding	UK Funding	Equity and Loan Finance	Tax and energy Incentives	Alternative Finance Models	Self-finance
				CO ₂ Reduction	Low Carbon Energy									
B) Buildings														
B1) Improve the energy efficiency of buildings	B1a) Continue improving the energy efficiency of domestic buildings through retro-fit.	LAs, RPs & their main contractors, private landlords, energy suppliers, low carbon industry	to 2020	H	L	M	H	✓		✓	✓			✓
	B1b) Improve the energy efficiency of commercial buildings, lighting and similar external infrastructure through retro-fit.	Commercial property owners and FMs & their main contractors, low carbon industry	to 2020	H	L	M	H				✓	✓		✓
	B1c) Continue improving the energy efficiency of public buildings, lighting and similar public infrastructure through retro-fit	LAs, NHS, universities, schools, FM contractors, low carbon industry	to 2020	H	L	M	H	✓			✓		✓	
	B1d) Decarbonise all new-build developments	Public and Private developers and contractors, low carbon industry	to 2027	H	M	M	H				✓		✓	✓
	B1e) Increase the commercialisation and demonstration of near to market building energy efficiency solutions.	Universities, Growth Hub, low carbon industry, public sector	to 2020	M	n/a	M	M	✓	✓	✓	✓			✓
	B1f) Increase use of energy monitoring and measuring technologies and services across all sectors	Growth Hub, local businesses, FM contractors, energy suppliers, low carbon industry	to 2020	L	n/a	M	M	✓			✓	✓		✓
B2) Stimulate innovation in low carbon energy efficiency for buildings	B2a) Maximise local collaboration between the research base and businesses to address market needs for energy efficiency in buildings.	Universities, Growth Hub, low carbon industry, public sector	to 2027	L	n/a	L	H	✓	✓	✓				✓
	B2b) Stimulate innovation by key growth sectors in building energy efficiency solutions	Universities, Growth Hub, high growth sectors	to 2027	L	n/a	L	M	✓	✓	✓				✓

Priority 3: Transport

This section covers only production of low carbon fuels suitable for use in transportation, for example bio-diesel, bio-ethanol and hydrogen. It should be noted that such fuels could also be used to generate heat or power, under the right economic circumstances. The key attributes of such fuels includes their ability to be stored and distributed to points of demand. Please refer to the LCTP for other actions relating to increasing low carbon transport and related infrastructure in the GBS area.

The GBS context and strengths for low carbon transport fuels include:

- Transport fuels make up just over a third of all energy consumed in the GBS area (31.3%) and consumption of energy for transport in the GBS area has reduced by 10.8% between 2005 and 2013.
- Roughly 2.16% of transport energy was supplied from renewable sources in 2013 and 2.41% in 2014.
- Low carbon fuel production as an activity is a significant strength for the GBS area compared to the rest of England (+4% more sales by this activity).
- The alternative fuels subsector had sales of £800.9m and grew at 6.6% in 2014/15.
- The GBS area is centrally placed within the English road and rail networks and has a natural position of advantage for the production, distribution and supply of fuels for transport.

Projects and opportunities that may contribute to increasing low carbon transport fuel production in the GBS area short and long term emerged from the research:

- HS2 – a strategic development that could demonstrate a whole place low carbon solution incorporating energy storage and use of energy for transport fuel
- Tyseley Environmental Enterprise District (TEED) – plans for the Energy Park within the TEED include low carbon energy storage and using the energy to fuel transport
- EBRI - using excess energy to charge vehicles or for battery storage
- Birmingham and Tamworth hospitals considering electric vehicle charging
- Any new business development site should be considered for alternative fuel supply or electric vehicle recharging points.
- Local Authority waste management contracts may lend themselves to biomethane and CNG plant opportunities

National activities and policies which contribute to production of low carbon fuels for transport include:

- RHI payments for production of bioenergy including biofuels.
- Work being driven by the Hydrogen Partnership to develop a network of hydrogen-supplied refuelling sites across the UK motorway network to support electric vehicle recharging

Barriers identified in stakeholder feedback include:

- Capital and operating expenditure constraints.
- Limited in-market ULEVs
- Limited refuelling points for ULEVs
- Risks of adopting early commercialised fuel production technologies
- Understanding the health & safety and environmental requirements for energy storage
- Planning policy and procedure red tape for fuel production and pipelines / private wire
- Skilled engineering resource to implement required systems

Gaps that need to be addressed include:

- The GBS area’s national ranking for alternative fuels has dropped from 6th to 8th in 2014/15, indicating that the GBS LEP has experienced below average growth in this subsector.
- There is a need for further work on the methodology for splitting out energy for transport at the GBS LEP level and statistics must be aligned on a single year (2014 baseline suggested) for target and reporting purposes.

Case study: Tyseley Energy Park Phase 2

Tyseley Energy Park includes an Energy Recovery Facility (ERF) processing 350,000 tonnes of Birmingham’s waste each year to produce low carbon power. The site is also home to a 10.3 MW biopower plant which uses innovative gasification technology to generate electricity from recovered wood waste.



The second phase of the Tyseley Energy Park will provide a green fuel facility and will use renewable energy that has been generated on site to produce alternative fuels such as hydrogen, electricity, methane and bio-fuels. The project will consider energy storage services and applications.

Energy storage would enable the project to participate in demand response and provide flexibility for energy distribution (pipeline or private wire) and on the future use of the energy for power, transport or heat.

Environmental Outcomes

Indicator	Baseline	Target	Gap
Total transport fuel consumed	2014 = 11821.9 GWh	2020 – 20% reduction in total energy for transport	2,364.4GWhs
Total low carbon fuel production	2014 = 2.16% from renewable sources based on national figures (255.353 GWh)	2020 – Low carbon energy provides 10% of total energy for transport in GBS area.	Estimates based on 2013 data: Energy for transport reduction: 926.84 GWh

Sector Growth Outcomes

Based on the research completed, the potential sector growth outcome is summarised below. This takes the subsectors with a high UK growth rate in 2014/15 and shows the potential contribution these could make to sector growth (through sales) in the GBS area by 2020. This growth can be supported by addressing any gaps identified in the research.

Sub-sector	Sales 2014/15	UK Growth forecast to 2020	Potential contribution to sector growth by 2020
Alternative Fuel Vehicles	£766.8m	9.2%	£70.5m
Alternative Fuels*	£800.9m	9.7%	£77.7m

**Alternative fuels includes fuels for heat and power, therefore this forecast crosses both Energy and Transport priorities*

Transport (*low carbon transport fuels*) Priority Actions for the GBS LEP

1. Increase uptake of low carbon transport
2. Stimulate innovation in low carbon transport fuels and distribution

Further detail on actions and activity is contained within the table below and the LCEP Full Report.

LCEP Priority Theme and Actions	Activities	Partners	Time-frame	Potential Outputs			Priority	Potential funding sources															
				Environmental		Sector Growth		ESIF	Other EU funding	UK funding	Equity finance	Loan finance	Tax and energy incentives	Alternative financial models	Self-finance								
				CO ₂ Reduction	Low Carbon Energy	Jobs, GVA and other indicators																	
C) Transport																							
C1) Increase uptake of low carbon transport	C1a) Increase the production of low carbon fuel for transport	Private + public developers, regulators, low carbon industry	to 2020	M	H	H	H					✓	✓	✓	✓	✓							
	C1b) Develop infrastructure for distribution and storage of low carbon transport fuels	Private developers, LAs, community sector, regulators, professional services, National Grid Gas Ltd, low carbon industry	to 2020	H	H	M	H	✓				✓	✓		✓	✓							
	C1c) Increase the commercialisation of near to market low carbon transport fuel solutions	Universities, Growth Hub, low carbon industry, regulators, professional services	to 2020	M	M	H	H	✓	✓	✓	✓	✓				✓							
C2) Stimulate innovation in low carbon transport fuels and distribution	C2a) Maximise local collaboration between the research base and businesses to address market needs for low carbon transport fuels and distribution	Universities, Growth Hub, low carbon industry, public sector	to 2027	L	L	M	H	✓	✓	✓						✓							
	C2b) Stimulate innovation by key growth sectors in low carbon transport technologies, systems and techniques	Universities, Growth Hub, high growth sectors	to 2027	L	L	L	M	✓	✓	✓						✓							

Priority 4: Business Process Energy Efficiency

This priority covers any activity which reduces the overall energy usage associated with business appliances and business processes rather than the fabric of or generic heating and power supply for a building. For instance; use of variable speed drives, compressed air, process-related heating, cooling and voltage optimisation. A key part of energy efficiency is monitoring and measuring energy usage. This will typically include energy monitoring and measuring solutions, such as sensors, data loggers and energy usage displays. Another important part of this industry is trained energy assessors who can help establish a baseline figure and how to prioritise and deliver changes that will impact energy usage in the most cost-effective manner.

The GBS context and strengths for business process energy efficiency include:

- In the GBS area, the energy management subsector had sales of £132.4m and grew at 4.1% in 2014/15. It is ranked 6th overall in England, which matches the overall low carbon industry ranking for the GBS area.
- The GBS area has an SME base of 58,330 companies.⁴

Projects and opportunities that may contribute to increasing low carbon transport fuel production in the GBS area short and long term emerged from the research

- Activities that are energy and resource intensive, such as manufacturing, present a market opportunity for the low carbon industry, in particular the energy management subsector.
- Investment in energy efficiency activities would lead to sector growth, not just in the low carbon industry but also in SMEs who reduce costs through implementing energy efficiency measures.
- Energy consulting and electrical and heating engineering skills are all core to implementing successful process management and monitoring systems to reduce energy use
- Energy efficiency initiatives that require minimal input (time and financial) from SMEs but make a major difference to the future prosperity at a local level are a worthwhile investment.
- Existing networks such as the local Green Business Clubs could also provide a structure for delivering support on process energy efficiency to businesses.
- The region's energy management subsector can be exploited here by focusing support on increasing the adoption of systems, products and services that can improve the monitoring and measuring of energy (heat and power) use.
- Monitoring and measuring should be an integral part of reducing energy and achieving energy reduction targets i.e. if you cannot measure something then you cannot manage it or improve it. Investment in activities which support businesses to improve monitoring and measuring of energy use can develop the market for a range of technologies and skills.
- Energy meters, sub-meters and energy management systems are the core products for monitoring and measuring but surrounding these core elements are many ancillary products as well as consulting and engineering services, which play a major role.

⁴ Office for National Statistics (2015) Count of Enterprises in the United Kingdom by Specified Employment and Turnover Size Band

- Ancillary products will include electrical componentry, heating pipework, tele-communications, energy controls and sensors including motion, daylight, pressure and temperature. This subsector is a key cross-over point with two other growth sectors: advanced manufacturing and software engineering (Digital and Media) and there is an opportunity to exploit the area's higher than average manufacturing activities to help bring new products to market.
- There are some plans for individual company site improvements that would increase business process resource efficiency.
- There is also a planned project called Resource Efficient Worcestershire, which aims to provide energy efficiency support and financial advice to businesses.

National activities and policies which contribute to business process energy efficiency, including large enterprises include:

- EU Emissions Trading Scheme
- Carbon Reduction Commitment (to be scrapped following the 2018/19 compliance year.
- ESOS Scheme - this is a mandatory energy assessment scheme for organisations in the tier below those in the CRC scheme. Energy assessments have to be completed every four years. Implementing changes recommended can reduce energy costs and offset the costs of having the assessment.
- National legislation requiring air conditioning servicing every 5 years.
- Western Power Distribution, along with other DNOs, has a key objective to reduce inefficiency in its main process, i.e. electricity distribution losses

Barriers identified in stakeholder feedback include:

- Capital and operating expenditure constraints.
- Finding time and taking risk to make changes
- Understanding and accessing funding.
- Skilled engineering resource to implement some systems

Gaps that need to be addressed include:

- Some stakeholders viewed business energy efficiency as something that businesses are implementing anyway without the need for intervention. However, it has been identified through a nationally recognised business support programme in the North West that if SME enterprises are left alone, most will fail to take effective action to improve energy and resource efficiency, even if they know they should.
- There is currently no programme aimed at delivering one-to-one support on business process energy efficiency to SMEs in the GBS area, although there are local Green Business Clubs that provide a forum for businesses to share ideas, good practice, and resources in order to deliver action. These are coordinated by Sustainability West Midlands through the West Midlands Green Business Clubs Network.⁵
- Renewable consulting and engineering activities are performing below average for the industry in the GBS area and these gaps should be investigated in more detail.

⁵ <http://www.sustainabilitywestmidlands.org.uk/projects/cross-sector-green-business-clubs-network/>

Environmental Outcomes

Indicator	Baseline year and figures(s)	Target and year	Gap
Total energy consumed	2005 = 46,156.1 GWH	Reduce total energy consumption by 20% by 2020 and 27% by 2027 through energy efficiency programmes for business process efficiency	2020 - 36,924.9 GWh 2027 - 33,693.98 GWh
Business process efficiency	2016, to be developed	Develop and deliver an ongoing programme to screen 10% of SMEs in the area per year for energy usage in key processes and in-house skills. Signpost them to funded energy assessment with a local qualified energy consultant by the end of 2016.	To be developed

Sector Growth Outcomes

Based on the research completed, the potential sector growth outcome is summarised below. This shows the relevant subsector's sales in the GBS area and UK growth rate in 2014/15, with the potential contribution it could make to sector growth (through sales) in the GBS area by 2020. This growth can be supported by addressing any gaps identified in the research.

Sub-sector	Sales 2014/15	UK Growth forecast to 2020	Potential contribution to sector growth by 2020
Energy Management*	£132.4m	6%	£7.9m

**Energy management includes solutions for managing energy in buildings; therefore this forecast crosses both Buildings and Business Process Energy Efficiency priorities*

Business Process Energy Efficiency Priority Actions for the GBS LEP

1. Improve energy efficiency of business processes
2. Stimulate innovation in business energy efficiency

Further detail on actions and activity is contained within the table below and the LCEP Full Report.

LCEP Priority Theme and Actions	Activities	Partners	Time-frame	Potential Outputs			Priority	Potential funding sources						
				Environmental		Sector Growth		ESIF	Other EU Funding	UK Funding	Equity and Loan Finance	Tax and Energy Incentives	Alternative Finance Models	Self-finance
				CO ₂	Low Carbon Energy	Jobs, GVA and other indicators								
D) Business Process Energy Efficiency														
D1) Improve energy efficiency of business processes	D1a) Increasing the uptake of business process energy efficiency measures by SME businesses	Growth Hub, LAs, local businesses, low carbon industry	to 2020	H	n/a	H	H	✓			✓	✓	✓	
	D1b) Increase usage of energy monitoring and measuring technologies and services across all sectors	Growth Hub, LAs, local businesses, low carbon industry	to 2020	M	n/a	M	M	✓			✓	✓	✓	
	D1c) Increase the commercialisation of near to market solutions that improve business energy efficiency.	Universities, Growth Hub, low carbon industry	to 2020	M	n/a	M	M	✓			✓	✓	✓	
D2) Stimulate innovation in business energy efficiency	D2a) Maximise local collaboration between the research base and businesses to address market needs for business energy efficiency	Universities, Growth Hub, low carbon industry, public sector	to 2027	M	n/a	L	L	✓	✓	✓			✓	
	D2b) Stimulate innovation by key growth sectors in solutions for business energy efficiency.	Universities, Growth Hub, high growth sectors	to 2027	M	n/a	L	L	✓	✓	✓			✓	

Whole Place Low Carbon Solutions

The low carbon investment priorities of the ESIF programme include whole place low carbon solutions. A whole place solution is a holistic approach within a defined area to reduce carbon emissions. This integrated approach would involve combining several connected measures within an area to generate greater impacts and maximise the value of any investments made. Integrated measures could include sustainable multimodal urban mobility, decentralised low carbon energy generation, smart grids and climate change mitigation measures.

Only a handful of projects in the LCEP project pipeline fit the criteria of a whole-place solution.

The case study below demonstrates some of the principles of an integrated solution in an existing asset, the European Bioenergy Research Institute (EBRI).

In addition, other stakeholders including hospitals are looking at integrated travel planning for their key time staff and site visitors with public travel operators in the area.

Case study: Intelligent Transport, Heating and Electrical Control Agent (ITHECA) Project

EBRI, based at Aston University, acts as a focus for pan-European activities on scientific and technological aspects of biomass conversion and utilisation of products for renewable power, heat, transport fuels, hydrogen and other chemicals.



The ITHECA project aims to demonstrate how the next generation of low carbon vehicle, heating and power infrastructure can be integrated and optimised through the use of intelligent control systems. As part of this, the project will help decarbonise the district heating network in Birmingham city centre (BDEC) by connecting its biomass gasification CHP to the network.

A prime output from this work is a set of tools and interfaces for energy modelling and management consolidating energy generation and demand information from heterogeneous distributed energy technologies including heat and power generation and energy storage. Mapping these diverse parameters into a coherent structure which will allow easy identification of triggers and thresholds suitable for demand response actions to be taken.

Projects that bring together the four priority areas identified by the LCEP, along with other low carbon activity solutions should be actively pursued by all stakeholders.

Other opportunities for a whole place low carbon solutions approach may be possible at the strategic investment sites including HS2 Curzon Street, UK Central, Tyseley Environmental Enterprise District and Energy Park.

Governance and Enabling Actions

The LCEP requires an organisational structure and governance to oversee development and delivery of the priorities.

Birmingham's Green Commission has by far the most developed governance structure within the GBS area, involving local stakeholders from the public, academic, business and community sectors on five round tables focusing on different aspects of climate change. The vision for the Green Commission is to make Birmingham a leading green city through action on carbon reduction, ecosystems services, adapting to climate change and the green economy.

The Commission has five roundtables (right) covering projects and activity in each area. The Energy & Resources roundtable is most closely aligned with the work of the LCEP.



The Commission and its roundtables are currently run with very limited resource supported by Birmingham City Council. There are some areas of overlap that the Commission will pursue with LEP authorities but the overarching resource requirements for delivering the LCEP are far greater than is currently available.

It is suggested that other LEP governance structures are analysed for best fit for the GBS LEP including the Project Delivery Unit and 'On the Platform' communication route from Greater Manchester and the cross panel project support and Business Communication Group from Leeds City Region.

GBS LEP and cross -LEP working

There is an overlap of geographies between the GBS LEP and Stoke-on-Trent & Staffordshire LEAs and between the GBS LEP and Worcestershire LEA. The neighbouring Black Country and Coventry & Warwickshire LEAs cover areas with strong geographic and business ties with the GBS area. These LEAs alongside GBS and local authorities throughout the area have developed strategies which impact on carbon emissions reduction and low carbon energy uptake.

As part of joint commitments made in developing the SEP and ESIF submissions, the GBS LEP has begun preparing joint working protocols with both Stoke & Staffordshire LEA and Worcestershire LEA which will underpin the respective LEA governance arrangements. The Green Commission will focus on discreet areas of overlap regarding the low carbon agenda within this.

Devolution

The West Midlands is currently in the process of developing a West Midlands Combined Authority and seeking devolved powers from Westminster. The Combined Authority will bring together parts of the GBS, Black Country and Coventry & Warwickshire LEAs giving the LAs in question a greater scope of control and influence in their areas, in particular by increasing the financial levers available to influence local planning and developments.

The LCEP will still operate at the GBS area level, with funding allocated until 2023 and beyond. Cross LEP working agreements are being developed to enable a smooth transition to include the WMCA once it is ratified by government in autumn 2016. The WMCA can have a positive and pivotal role in influencing local authority plans and policies across the three LEP areas as the Combined Authority moves to operational status. The LCEP will also support the refresh of the Strategic Economic Plans which will influence the work of the WMCA. There may be opportunities to scale up successful projects and delivery vehicle across the Combined Authority in the future.

Enabling Priority Actions:

LCEP Enabling Priority Actions for the GBS LEP

- 1. Establish GBS LEP as a leader in low carbon energy**
- 2. Champion local sectors that contribute to low carbon energy**
- 3. Deliver the LCEP in a co-ordinated way**
- 4. Develop and deliver a LCEP communications strategy**
- 5. Develop minimum energy standards for new build development**
- 6. Align planning policy with LCEP ambitions**

Further detail on actions and activity is contained within the table below and the LCEP Full Report.

LCEP Enabling Themes & Actions	Activities	Partners	Timescale	LCEP Priority
E) Leadership				
E1) Establish GBS LEP as a leader in low carbon energy	E1a) Build the global competitiveness of the GBS LEP area by raising the profile of low carbon energy opportunities and achievements at a national, EU and international level.	GBS LEP with Distinctly Birmingham and neighbouring LEPs	to 2020	All
	E1b) Ensure that low carbon energy becomes an integral part of GBS LEP strategic priorities including HS2, UK Central and other growth strategies.	GBS LEP	to 2020	
E2) Champion local sectors that contribute to low carbon energy	E2a) Identify GBS low carbon energy leaders and showcase individuals and companies' success stories.	GBS LEP	to 2020	
F) Governance				
F1) Deliver the LCEP in a co-ordinated way	F1a) Secure funding / budgets for all governance arrangements including staff and marketing.	GBS LEP with stakeholders	Immediate	All
	F1b) Develop organisation and governance arrangements across WMCA, LEPs, LAs and local delivery and support partners.	GBS LEP with stakeholders	Immediate	
	F1c) Define roles for all key stakeholders and consider stakeholder representation needed for governance.	GBS LEP with stakeholders	Immediate	
	F1d) Provide resource (people) to enable GBS LEP to support all LCEP governance functions including statistical reporting, cross-sector and cross-LEP working and delivery of the low carbon energy project pipeline.	GBS LEP	Immediate	
	F1e) Continue to develop a pipeline of low carbon energy projects that add value to the GBS LEP area.	GBS LEP with stakeholders	to 2020	
G) Communication				
G1) Develop and deliver a LCEP communication strategy	G1a) Communicate LCEP governance including organisational structure, defined roles and responsibilities.	GBS LEP	Immediate	All
	G1b) Communicate GBS LEPs low carbon energy ambitions widely.	GBS LEP	Immediate	
	G1c) Engage with large commercial and public organisations (including NHS) to gain their support for and participation in delivery of the LCEP.	GBS LEP	Immediate	
	G1d) Facilitate networking amongst local stakeholders to encourage formation of partnerships and co-operative action.	GBS LEP	Immediate	
	G1e) Promote the benefits to businesses of implementing low carbon energy actions and clearly communicate what support is available in the GBS LEP area.	Business Growth Hub	Immediate	
H) Policy				
H1) Develop minimum low carbon energy standards for new build development	H1a) Use the existing Birmingham Green Commission Buildings and Efficiency roundtable to consult on and set minimum standards for new build developments (domestic and commercial as a minimum with further development types added in the future) and gain support from GBS LEP partners to set the standard across the LEP area.	GBS LEP with Green Commission and stakeholders	to 2020	Buildings
H2) Align planning policy with LCEP ambitions	H2a) Review existing planning policy relating to low carbon energy and recommend changes where needed.	GBS LEP with LAs and neighbouring LEPs	to 2020	Energy, Buildings and Transport

Cross-cutting themes

Two cross-cutting themes for the LCEP were identified:

1. **Monitoring and measuring**
2. **Low carbon skills**

These are pre-requisites to many of the actions in Priorities 1 to 4 above.

1. Monitoring and measuring

For GBS LEP, monitoring and measuring is primarily about having the right agreements in place for data collection and sharing, a documented and understood methodology and process for collating, analysing and assessing progress about a given indicator and target.

For organisations more widely, monitoring and measuring is inherent in all forms of energy management and energy efficiency improvement work.

Recommended targets and indicators

Without a baseline position and targets to measure against, progress cannot easily be reported and use of public funding cannot be accounted for appropriately.

Based on the research completed it is recommended that GBS LEP-level targets and indicators are developed and adopted as part of the LCEP covering the following topics. Whilst some of the core targets have been explored through the LCEP, a larger list, to be explored and developed, has been compiled below.

Priority	Indicator
Overall target	Reduction in carbon emissions
Energy	Reduction in total energy consumption and for each end use: power, heat and transport (energy efficiency)
	Low carbon power generation - power, heat and fuel for transport
	Net low carbon power import / export
	Local energy storage capacity for power, biomass, biogas, thermal
	Number of projects involving local energy storage, fuel distribution system projects, energy management
	Capacity of energy storage in GBS area by type (thermal, battery, biogas, biomass, hydrogen, Refuse Derived Fuels)
	Number of projects engaging local businesses in energy management and demand response aggregation
Buildings	Domestic sector – 20% improvement in overall EPC ratings
	Domestic sector – Improvement in % of properties in EPC Bands E & F compared to the national average.
	Public sector – 20% reduction in energy usage
	Business / commercial sector – 20% improvement in overall EPC ratings
	Minimum standards for energy efficiency on all new developments connected to the National Grid.
Business Process Energy	Low carbon product, system or process improvement research projects involving SMEs new to the process

Efficiency	Low carbon product, system or process commercialisation projects involving SMEs new to the process
Sector growth	Low carbon industries growth – sales, companies, employees
	Improvement of key subsector gaps, e.g. Building Technologies, to match overall GBS area ranking within England by GVA or GDP
	Number of businesses coming forward with low carbon challenges for research
Low Carbon Skills	Number of fully accredited installers of low carbon energy efficiency measures. Membership of professional bodies e.g. NICEIC.

Some of these targets have been presented above but some are not possible to define fully at this time and must be developed further by GBS LEP. Some may require further work with key stakeholders, for example local private landlords, all LAs, DECC, Western Power Distribution, etc. to take forward.

Headline statistics for the GBS area:

Theme / Statistic	Statistic	Comment
Economy		
Population	1.96million	Expected to grow by 4.9% by 2020
Businesses	67,000	
Of which:	1,835	Low carbon industry businesses
Jobs	918,000	
Of which:	33,405	Low carbon industry jobs
GVA	£35.4bn	
Of which:	£4.5bn	Low carbon industry sales
Environment		
Total carbon emissions - 2013	11,278 ktCO ₂	Widest definition of carbon emissions available at sub-regional level
% reduction from 2005	15.6%	
Total energy consumed - 2013	37,789 GWhs	This is equivalent to 30.4% of the West Midlands and 2.6% of the UK usage.
% reduction from 2005	18.1%	Redditch reduced usage by 25.9%
Total electricity - 2014	8635 GWh	Down 5.2% from 2005
Of which:	234.2 GWh	GBS low carbon power generated - 2014
Total energy used for heat - 2013	18,936.4GWh	Down 23.6% from 2005
Of which:	2.2GWh	GBS low carbon heat generated - 2013
Estimated energy for transport - 2013	11,821.9GWh	Down 10.8% since 2005
Of which:	255.4 GWh	Estimated from low carbon sources
Domestic building EPCs in Bands E & F	31%	5% worse than national average.

2. Low carbon skills

For GBS LEP, low carbon skills are required for strategy planning, ongoing monitoring and measurement work and for signposting businesses to the right part of the LEP organisation, e.g. the growth hub or to external support.

For organisations more widely, low carbon skills are required for assessing options for reducing carbon emissions, increasing energy security, or merely considering investing in an energy assessment. Skills are also required within the low carbon industry to deliver low carbon energy solutions, e.g. engineering services skills and consulting skills.

For all members of the public in the GBS area, a greater awareness of carbon emissions and low carbon energy topics, or “carbon literacy” can be very beneficial to help people make every day decisions that will help reduce the area’s carbon emissions, e.g. making use of public transport vs. driving.

The low carbon skills agenda requires more development by GBS LEP and any actions coming out of this development should be incorporated into the LCEP. GBS LEP has appointed sector champions across the high growth sectors to identify priorities such as access to affordable finance, business support, skills and training and supply chain development.

Priority Actions for Monitoring and Measuring

- 1. Improve non-domestic EPC and public building DEC data to support delivery of the LCEP Buildings priority**
- 2. Improve overall monitoring and measuring of the LCEP**
- 3. Develop a pipeline of planned development across the GBS LEP area**
- 4. Establish targets to enable progress against LCEP priorities to be monitored and reported**

Priority Actions for Low Carbon Skills

- 1. Improve low carbon energy skills across all sectors**
- 2. Improve skills to develop fundable projects**
- 3. Drive up ‘carbon literacy’ of all stakeholders**

Further detail on actions and activity is contained within the table below and the LCEP Full Report

LCEP Enabling Themes & Actions	Activities	Partners	Timescale	LCEP Priority
I) Monitoring and Measuring				
I1) Improve non-domestic EPC and public building DEC data to support delivery of the LCEP Buildings Priority	I1a) Liaise with DECC to obtain data that is analysed and extrapolated at sub-national level (by post code).	GBS LEP with DECC	to 2020	Buildings
I2) Improve overall monitoring and measuring of the LCEP	I2a) Develop an ongoing relationship with DECC to understand future developments in monitoring and align LCEP monitoring and measuring accordingly.	GBS LEP with DECC	to 2027	All
I3) Develop a pipeline of planned development across the GBS LEP area.	I3a) Identify and monitor the impact that planned property and infrastructure development will have on energy consumption and carbon emissions.	GBS LEP with LAs, Private Developers	to 2020	Energy & Buildings
I4) Establish targets to enable progress against LCEP priorities to be monitored and reported	I4a) Establish targets for monitoring and measuring achievement against the LCEP:	GBS LEP and partners	to 2020 and to 2027	All
	i) Carbon emissions reduction equivalent to greater than 2% a year to 2050 for areas covered by the LEP.			Energy
	ii) Contribution of renewable energy to overall energy consumed (all sectors and at least heat, power and transport) in line with national targets			Buildings
	iii) Improving energy efficiency in domestic, commercial and public sector buildings in line with national energy efficiency targets			Buildings
	iv) Closing the gap between GBS and national domestic housing energy efficiency as demonstrated by EPC ratings.			Buildings
	v) Growth in number and capacity of energy storage sites in active use.			Energy
	vi) Growth in production of low carbon fuels for transport.			Transport
I5) Establish data collection, statistical analysis and reporting.	I5a) Establish the data required to support monitoring of the above targets including data sources, methodology for statistical calculations and analysis and reporting format / frequency to be used.		to 2020 and 2027	Bus. process efficiency
J) Skills				
J1) Improve low carbon energy skills across all sectors	J1a) Identify low carbon energy skills gaps across all sectors and build actions and activities for improvement into the LCEP.	GBS LEP	Immediate	All
J2) Improve skills to develop EU-fundable projects.	J2a) Recruit stakeholders with key skills or invest in training and share experiences with other LEPs.	GBS LEP with stakeholders	Immediate	All
J3) Drive up "carbon literacy" of all stakeholders.	J3a) Develop and deliver a marketing campaign about low carbon energy.	GBS LEP with stakeholders	to 2020	All

Funding and Finance

The main categories of funding and finance identified are:

- European Structural and Investment Funds – Grant aid.
- Other EU Programmes – Grant aid.
- UK Funding – Government grant aid and other government sponsored schemes
- Equity and Loan finance.
- Tax and Energy Incentives – Including savings from compulsory schemes.
- Alternative Finance Models – Including pension funds, prudential borrowing, crowd funding and community shares

The Table below lists the main types of funding and finance, mapping these to LCEP priorities.

Type of Funding / Finance	Name	Mapping to LCEP							Outcome: Sector Growth	Outcome: Environmental
		A) Energy	B) Buildings	C) Transport	D) Business Process Energy Efficiency	Enabling: J) Monitoring & Measuring	Enabling: -J) Low Carbon Skills			
European Structural and Investment Funds	ERDF	See Table 5								
Other EU Programmes	Horizon 2020	✓	✓	✓	✓	✓	✓	✓	✓	
	JESSICA	✓	✓	✓					✓	
	JEREMIE							✓		
UK Funding	Energy Company Obligation		✓						✓	
	Heat Network Delivery Unit	✓							✓	
	Innovate UK	✓	✓	✓	✓	✓	✓	✓		
	Skills Funding Agency						✓	✓		
	Urban Community Energy Fund	✓							✓	
Equity and Loan Finance	CO2 Sense	✓							✓	
	Energy Efficiency Loans Scheme (Salix Finance)		✓						✓	
	Green Investment Bank	✓			✓				✓	
Tax and Energy Incentives	Finance Birmingham							✓		
	Contract for Difference	✓							✓	
	Carbon Reduction Commitment		✓						✓	
	Climate Change Levy & Climate Change Agreements	✓			✓				✓	
	Enhanced Capital Allowances		✓		✓				✓	
	Enterprise Investment Scheme							✓		
	EU Emissions Trading Scheme	✓							✓	
	Feed in Tariff and Export Tariff	✓							✓	
	Renewable Heat Incentive	✓							✓	
	Renewables Obligation Certificates	✓							✓	
Alternative Finance Models	Seed Enterprise Investment Scheme							✓		
	Business Rate Retention							✓		
	Community Infrastructure Levy	✓	✓						✓	
	Community Investment Models	✓							✓	
	Local Authority Prudential Borrowing	✓	✓						✓	
	Crowd Funding and Community Shares	✓		✓				✓	✓	
	Energy Performance Contract		✓						✓	
	Energy Services Company	✓							✓	
Pension Funds	✓	✓						✓		

LCEP Immediate Actions

Key research findings

The key findings from the research completed are summarised below:

1. Environmental and economic benefits are the ultimate drivers for developing a low carbon energy plan.
2. Cost reduction is the key driver for private and public sector organisations making low carbon investments; in the private sector for profitability and competitive advantage; in the public sector to continue delivering public services within reduced budgets.
3. Of the low carbon energy themes explored, low carbon energy production and associated infrastructure are the most important because energy generation and usage drives most of the UK's carbon emissions.

LCEP Priorities

There are four key priorities and two cross-cutting themes for activities within the LCEP. Activities under these priorities reflect the gaps, issues and strengths which emerged from the research. An outcome of all priorities and cross-cutting themes will be environmental benefits and sector growth in the area's five growth sectors.

Priority Areas	Energy	Buildings	Transport	Business Energy Efficiency
Cross-cutting themes	Monitoring & Measuring			
	Low Carbon Skills			



Environmental benefits (CO2 reduction, low carbon energy)

Sector growth for five GBS LEP growth sectors

Funding Sources

An immediate funding option for some of the actions identified is the ESIF programme. Analysis of other funding options has identified the most appropriate funds for each priority area of the LCEP.

Governance

One of the key outputs of the stakeholder interview and workshop process was strong advice around setting up governance of the LCEP. Enabling actions for governance and associated actions relating to cross-cutting themes resulted from this. Immediate actions identified form the basis of the Next Steps section, below.

Next Steps

To take the LCEP forwards, the following immediate next steps are recommended.

1. Ratify the priorities and suggested targets with the LEP Board.
2. Appoint a senior LEP Board member to lead on the Low Carbon Energy agenda for the GBS area
3. Secure funding for and identify the resources required to run the governance structure.
4. Set up an organisation for governance of the LCEP using the Green Commission as a model and incorporating key ideas from other LEPs and existing expertise, including:
 - a. The Project Delivery Unit and 'On the Platform' communication route from Greater Manchester
 - b. The cross panel project support and Business Communication Group from Leeds City Region
 - c. Existing organisations such as "Marketing Birmingham" for marketing and PR and the Regional Observatory for statistics and statistical analysis, existing local business and community networks and funded research organisations.
5. Document the proposed governance processes and agree with partner LEPs and the emerging West Midlands Combined Authority (WMCA), for example:
 - a. Which existing organisations and LCEP posts will be involved in delivering the LCEP and in what capacity?
 - b. On what selection criteria and through what process will governance positions and stakeholder be appointed and for what period of time before reselection?
 - c. How often will LCEP progress against targets be reported?
 - d. Where will progress against LCEP targets be reported (e.g. LEP Board, LEP AGM, Other LEPs, WMCA, LAs)
 - e. What process will be used and how often, to update the strategy and plan?
6. Develop a communications plan to cover:
 - a. Announcement of the LCEP and LEP ambitions for the area
 - b. Attracting investment for low carbon energy projects
 - c. Encouraging local stakeholders to share project pipeline information
 - d. Encouraging large energy-users in the area to share their low carbon challenges with the local research community and sector businesses
 - e. Sign-post local stakeholders to business support and funding available for low carbon projects (via the Growth Hub)
7. Continue to build on the project pipeline information with local stakeholders.

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