'Derby'sClimate Change' Strategy

Contents

Foreword

This strategy sets out Derby's ambitions to embrace the challenges that climate change will bring in a proactive way. It acknowledges the severity and magnitude of this issue on the planet, the impacts this is likely to have across the world, and the role of humans in shaping our climate. However, the main aim is to address this global issue at a local level in a way which benefits people, the economy and environment.

This Strategy is a starting point for future action; providing a framework through which partners across the city can work together to reduce the city's greenhouse gas emissions, and address the challenges and any opportunities that a changing climate will bring.

The aims of this strategy are to:
1. raise the profile and understanding of how Derby can proactively respond to climate change
2. develop a shared vision for Derby about this critically important issue;
3. recognise and build on the strengths of the city while identifying the gaps that exist in tackling this complex and challenging issue;
4. promote long term, integrated planning across different disciplines and organisations to help managethe city's response to climate change.

This strategy identifies strategic priorities (referred to as 'themes') for responding to climate change in Derby. The themes are defined below and are discussed in this document:

Table 1. Priority Themes

Derby will be a city that benefits from:

a thriving sustainable economy	Businesses are able to take advantage of technology, goods and services which enable them to use resources more efficiently while creating growth through innovation in low carbon markets.
smarter travel options	Local people and businesses choose to use a range of easily accessible and integrated lower carbon travel choices.
energy efficient homes	Local people have homes that enable them to reduce their demand for energy and to use energy more efficiently.
a secure local and renewable energy supply	Derby is able to reduce its reliance on energy from fossil fuels through a locally generated, diverse, efficient and more secure energy supply.
being prepared for a changing environment	Derby is able to plan, measure and respond proactively to the effects of climate change and to implications of resource scarcity.
an active community	Local people and businesses are able to access skills and learning opportunities that promote positive action, collaboration and changes in behaviour.

Section 1: The Issue

Internationally, climate change has been recognised as the greatest long-term environmental threat, posing far reaching impacts upon our lives, health and well-being, our economy and natural environment.

Climate change can be defined as "a change in the average state of the climate and/or the variability of its properties" (Met Office 2013).

The climate has and will continue to change naturally, however the scientific evidence is that our climate is changing rapidly primarily as a result of human activity. According to the Fifth Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC)[1], the leading United Nations scientific body for the assessment of climate change, 'Warming of the climate system is unequivocal and since the 1950s, many of the observedchanges are unprecedented over decades to millennia' and that 'Human influence on the climate system is clear'[2].

The warming of the climate system is evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea levels. Records also show that there is now almost 40% more carbon dioxide, the main greenhouse gas, in the atmosphere than there was before the industrial revolution, a level not experienced for at least the last 800,000 years. Consequently, the global average temperature continues to rise, and 2000–09 was the warmest decade for over 150 years of records. A report published in August 2013 by scientists from the United States Department of Commerce, confirmed that 2012 was one of the 10 warmest years on record globally, with sea levels reaching record highs and Arctic Sea ice hitting record lows.

Figure 1: Reconstructions of global temperature against measured global temperatures

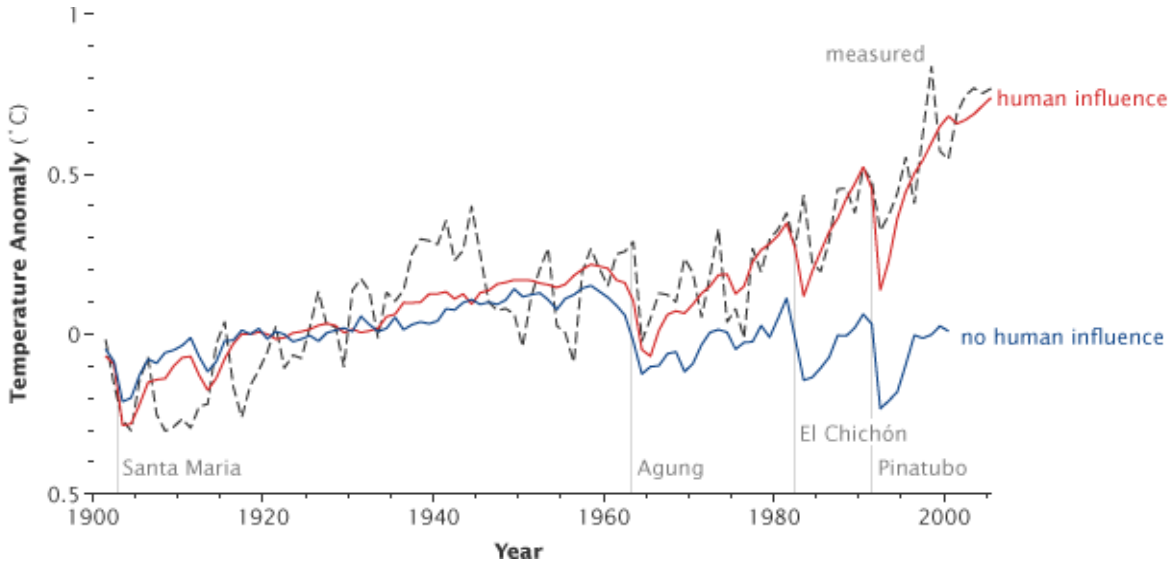


Figure 1 - shows modelling of global temperature that include greenhouse gas increases and other human influences (red line) which can be seen to closely match actual measured temperatures (dashed line). The modelling which only includes natural

[1] www.ipcc.ch

[2] Working Group I Contribution to the IPCC Fifth Assessment Report, Climate Change 2013: The Physical Science Basis, Summary for Policymakers http://www.climatechange2013.org/images/uploads/WGIAR5-SPM_Approved27Sep2013.pdf

influences (blue line,) shows that a slight cooling would have been expected without human influence, which has not occurred. Graph adapted from Hegerl and Zwiers et al., 2007 by NASA's Earth Observatory.[3]

Climate Change Facts:

- The Earth's surface has warmed by about 0.8°C since around 1900 and by around 0.5°C since the 1970s.
- The average rate of global warming over the period from 1901 to 2010 was about 0.07 ºC per decade.
- More than 30 billion tonnes of CO_2 are emitted globally each year by burning fossil fuels. Average global temperatures may rise between 1.1°C and 6.4°C above 1990 levels by the end of this century.

(Source: Department of Energy and Climate Change)

Climate Change Impacts

Internationally, an average global temperature rise of 2°C has been recognised as the limit that is required to avert the worst possible consequences of climate change. To stand a reasonable chance of maintaining this limit, concentrations of carbon dioxide in the atmosphere need to be kept below 350parts per million (ppm). However in 2013, the concentration of carbon dioxide in the atmosphere recorded at the US government's Earth Systems Research laboratory in Hawaii, reached the symbolically important 400ppm level for ~~the first time.~~

National figures show that UK greenhouse-gas (GHG) emissions have been on the decrease however the latest figures show that 2012 emissions were actually 3.5% higher than in 2011. In addition these figures only take into account emissions produced in the UK, not the emissions from all the goods and services imported and consumed in the UK and statistics suggest that these emissions are rising as we increasingly import goods that we consume.

Global concentrations above 400ppm put the planet on track for levels of warming deemed 'dangerous' by the international communityand a level at which it is not possible to ensure that a temperature rise of more than 2^oC is avoided.

A 2^oC rise in average global temperatures may not seem dangerous however the implications may be severe. The current one degree rise has already shown severe impacts for thePolar Regions and small island states:

- The Antarctica is now losing around 190 billion tonnes of ice a year. Eighty percent of the Maldives lies three feet or less above sea level and with sea level rising aglobal average rise of 0.13 inch (3.3 millimetres) per year from 1993 to 2008 this has a significant impact on the island state.

- Global sea levels have risen around 17cm in the last century (NASA 2013[4]) with the rate in the last decade being double that of the last century.

[3]Hegerl, G. C., Zwiers, F. W., Braconnot, P., Gillett, N. P., Luo, Y., Orsini, J. A., Nicholls, N., et al. (2007). Chapter 9: Understanding and attributing climate change. In Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. [Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B. , Tignor, M., and Miller, H.L. (eds.)] Cambridge and New York: Cambridge University Press.

The chief economist of the International Energy Agency (IEA[5]) has warned that to meet the 2°C target, globally we must make changes in how energy is produced and consumed by 2017 and that with current global policies, the planet is on track for a global rise of 6°C.

Impacts of warming above 2°C are likely to include significant reductions in food production in some regions, hundreds of millions of people without enough water, mass species extinctions and sea levels rising by up to several metres.In the UK, we are likely to witness more extreme events, such as flooding, storms, sea level rise and drought as well as wetter warmer winters and hotter drier summers.

In the next ten to twenty years, in Derby we are likely to experience more extremes in weather such as high winds; intense periods of rainfall; storms; increased very cold events in the winter, higher summer day and night-time temperatures; alongside an overall trend of warming temperatures. Further details on climate projections can be found at http://ukclimateprojections.defra.gov.uk/ .

If we do nothing now to curb greenhouse gas emissions, concentrations will continue to rise increasing the severity of the adverseenvironmental impacts and significant humanconsequences: melting of the Greenland icecaps, extinction of large numbers of animal species, flooding, extreme weather events, ocean acidification and reduction in crop yields.

Even with strong action now and in the future to reduce greenhouse gas emissions, past and present emissions mean that climate change is inevitable and as individuals, organisations and a city we need to respond to the threats and make significant change to respond to climate change.

These changes will have a serious impact upon us locally; not just on our natural environment but also on the way we live and our social and economic wellbeing. These impacts include:

Extreme weather such as flooding:

- flooding can cause traffic disruption and damage to homes, businesses and infrastructure all of which lead to increased costs and affect long term well-being. In addition extreme heat events are recognised as responsible for increased death rates.

Water supply:

- changing rainfall patterns leading to unpredictable rainfall and water shortages. Water shortages will impact upon local biodiversity as well as food production.

Food production:

- the supply and price of food will be affected due to impacts upon crop growth whichresult in poor harvests. Increases in food prices will impact upon people's ability to afford staple foods which can have health implications.

Health:

- as a result of extreme weather events such as heat waves, prolonged cold winters, floods, storms, fires and droughts, there is an increased risk to health. In addition to impacts on wellbeing, increased health issues will put pressure on healthcare services.

[4]http://climate.nasa.gov/evidence
[5]http://www.iea.org/publications/worldenergyoutlook/pressmedia/quotes/8/

Biodiversity:

- Some species may benefit from climate change (including, from a human perspective, an increase in diseases and pests) but the rapid nature of the change suggests that most species will not find it as beneficial as most will not be able to adapt in time.

For further information on climate change impacts see the UK Climate Change Risk Assessment: Government Report 2012 and A Summary of Climate Change Risks for the East Midlands.

Derby will also be affected by the wider global impacts of climate change such as the pressure on the availability of natural resources caused by a changing climate. Businesses and people in Derby depend on materials, goods, and energywhich originate from around the world, the supply of which could be significantly affected with interruptions to supply resulting in price rises.

Section 2: A City-wide Response

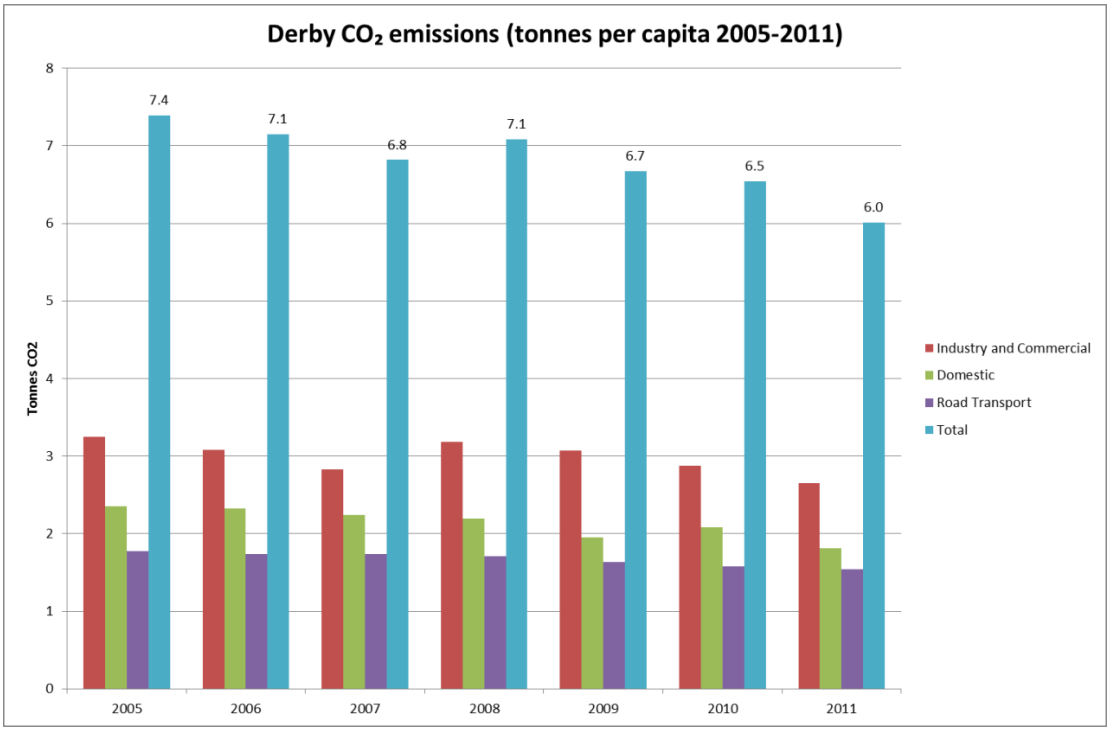
The UK is committed under the Climate Change Act 2008 to an 80% emissions reduction by 2050 compared to 1990 levels and to build the UK's ability to adapt to climate change. To ensure that regular progress is made towards this long-term target, the Act also established a system of five-yearly carbon budgets. The current carbon budgets commit the UK to a 17% emissions cut by 2020 on 2010 levels (34% emissions cut on 1990 levels) and a 50% cut by 2025[6].

Meeting the extremely challenging 80% reduction target by 2050 cannot be achieved bynational Government on its own. Reductions in emissions require significant change in the way we do things and practical action by every community, business and individual throughout the country. Derby needs to play its part at a local level by reducing the city's carbon emissions while at the same time preparing for the inevitable impacts of a changing climate.

City-wide emissions

Government figures have shown that in Derby, from 2005 to 2011,city-wide carbon emissions have fallen by 14%, a fall of nearly 250kt of carbon dioxide to level of 1481kt CO_2. This fall is across all the three major sectors which are defined as domestic, transport and commercial/industrial. Per person this represents a fall from 7.3 tCO_2 in 2005 to 6.0 tCO_2in 2011 which is currently lower than the UK average of 6.9 tCO_2 (DECC 2013).

Figure 2: CO2 emissions per person in Derby from 2005 to 2011



Source: DECC

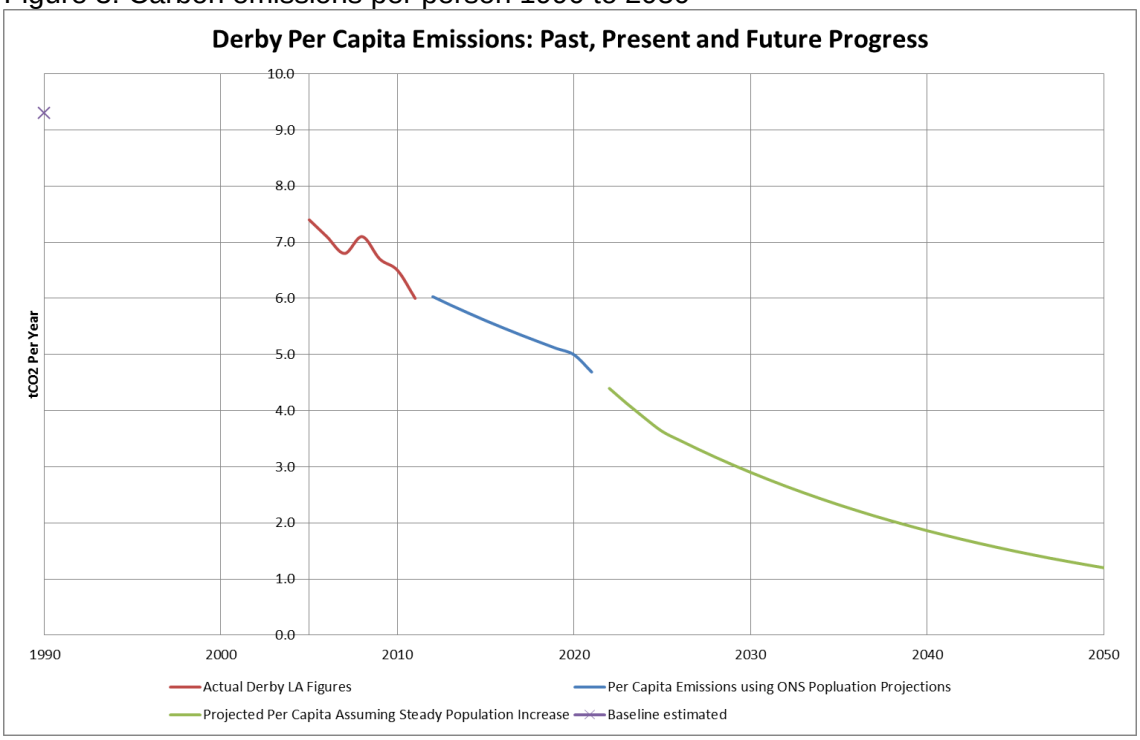
Despite a positive decrease in emissions in Figure 2, modelling (through a scenario modelling tool called Vantage Point) suggests that Derby will not achieve the carbon emissions reduction target of an 18% reduction on 2008 levels by 2020 without intervention

[6]For further information on carbon budgets visit: https://www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050/supporting-pages/carbon-budgets

above the level that may be implemented by the Government Low Carbon Transition Plan[7] (LCTP). Vantage Point modelling looks at measures and technologies that the Government is seeking to introduce through the LCTP across the three sectors and applies a level of take up of the measures to Derby to assess the impact on the city-wide carbon emissions.

The modelling predicts that even if all the measures within the LCTP are implemented in Derby, the city will fall short of the target by around 24%. This demonstrates the need for the city to address carbon emissions across all three sectors and to implement additional local measures.

Figure 3: Carbon emissions per person 1990 to 2050



Sources: ONS, DECC.

Figure 3[8] illustrates the journey to the 2050 target of 80% reduction. The graph shows an estimated 1990 emission level for Derby, actual figures for 2005 through to 2011 and projections for 2011 to 2050 and demonstrates the steep reduction in emissions required.

A city-wide strategy

This Strategy builds on commitments that have already been made within the city to tackle carbon emissions and respond to a changing climate. In 2005, the City Council made a cross party commitment to reducing carbon emissions and established a corporate Climate Change Strategy in 2010.

This first city-wide strategy identifies six strategic level priority themes (defined in Table1, page 2) which seek to address both climate change mitigation and resilience (Table 2). The

[7] The LCTP 2009 set out a five point plan to tackle climate change and deliver on carbon budgets

[8] The projections use national (ONS) figures for the population in Derby, and the rest of the back- and fore-casting makes use of national carbon reduction progress figures, assumptions of periods of steady annual population increases and carbon reduction decreases using the available information and national interim carbon targets. It is only indicative.

Strategy addresses each theme by building a picture of where the City needs to be, where the City is now and a number of key high level actions for moving forward.

Table 2: Mitigation and resilience

Mitigation	Reducing the release of greenhouse gases by using less energy more efficiently and changing to renewable energy sources and contributing to the national target of an 80% emissions reduction by 2050 compared to 1990 levels.
Resilience	• Adaptation: preparing communities and environments for inevitable negative impacts of a changing climate while at the same time maximising the ability to identify and respond to any opportunities • Resource security: recognising that the issue of climate change will be exacerbated by, and exacerbate resource depletion. Examples include loss of habitat (including carbon sinks), species, air-quality, water and essential natural inputs(food, energy, water, metals, and oil).

Going Forward

This Strategy aims to take a proactive approach to climate change mitigation and resilience; recognising that the city must take action to curb carbon emissions and prepare for the inevitable impacts of climate change. A do nothing or business as usual response is not being considered as an approach as this would leave the city, local people and economy at risk.

This Strategy does not prescribe in detail what needs to be done under each of the priority themes rather it identifies high level actions to be addressed through partnership working and joint initiatives. This approach has been taken in recognition that no single organisation has the remit, expertise and resources to address climate change on its own.

To acknowledge and enforce the partnership approach the Derby Renaissance Board is the sponsoring body for the Derby's Climate Change Strategy and will oversee the progress that is made through an annual progress report.

The City Council will support the on-going development of the Strategy and recognise the need for a long term approach to tackling this issue by seeking cross party commitment for the Strategy and the priority themes. In addition to encourage continued partnership working the City Council will continue to support the Climate Change Alliance, a partnership of key organisations within the City with a keen interest in the climate change agenda, who will have ownership of and endorse the Strategy.

To monitor the progress of the Strategy each priority theme will be reported upon and Derby's contribution to the following national targets will be evaluated annually by the Council Climate Change Team:

- An 80% emissions reduction in city-wide emissions by 2050 compared to 1990 levels with the milestones of 34%by 2020 and 50% CO_2 reduction by 2030. Per capita emissions reduction in excess of these figures will be used to gauge progress.
- 15% of the UK's energy demand to be from renewable sources by 2020.
- All new homes to be 'zero carbon' by 2016 and all new buildings by 2019.
- Implementation of a UK-wide climate change risk assessment (CCRA) and national adaptation programme
- No person lives in fuel poverty, as far as is reasonably practicable, by 2016.

Table 3: The priority themes

1. A thriving sustainable economy Developing a **low-carbon economy** is a way of taking advantage of, and progressing, the need to reduce carbon emissions and reliance on increasingly expensive energy sources. It is a sector predicted to grow and it is vital Derby can benefit from this. Locally it focuses on enabling businesses to take advantage of traditional environmental goods and services and using resources more efficiently. It is also about creating new opportunities through innovation and technologies.	**2. Smarter travel options** The choice of transport has a significant impact on carbon emissions. Within Derby, nearly a quarter of the city greenhouse gas emissions are from transport, making carbon reduction from this sector a priority. The theme of smart travel looks at environmental and more sustainable options that are accessible and easy for residents and businesses to use.
3. Energy efficient homes Residents contribute to carbon emissions with domestic emissions accounting for 30% of city wide emissions (2011) and there is a need for action to reduce carbon emissions from homes. Residents will also be affected by changes in the climate due to increased heat and cold weather events as well as energy insecurity impacting upon energy supply and people's ability to pay for heat and power.	**4. A secure local and renewable energy supply** Enabling access to decentralised and low-carbon energy supplies is a move away from the reliance on carbon-intensive centralised energy systems such as power station generated electricity. Decentralised and low carbon energy looks at renewable electricity, local district heating systems and using alternative and local fuel sources.
5. Being prepared for a changing environment Adaptation to a changing climate and resource constraints is a crucial part of safeguarding and improving the area's economy, society and environment. Across the city there needs to be long term decision making to adapt, and be prepared for changes in weather, climate and key resources such as food, energy, water and materials for the economy. By being prepared it will reduce the vulnerability of the city and the organisations and individuals within it and be able to recognise and capture any benefits from climate change.	**6. An active community** Access to information, skills development and the communication of climate change in a way that engages residents and businesses across the city is vital in creating changes in behaviour. So too is the need to foster, coordinate and support community groups and an active third-sector which can contribute to the delivery of city-wide strategy and provide volunteering and employment opportunities. This theme impacts upon and is integral to the other five themes.

Section 3: The Themes

A thriving sustainable economy

Businesses are able to take advantage of technology, goods and services which enable them to use resources more efficiently while creating growth through innovation in low carbon markets.

Derby will be a city where businesses have taken advantage of the opportunities created by the low carbon economy and built on its strengths to generate growth, new jobs and investment in the city. Businesses in traditional areas of manufacturing, industry and design have adapted to operate efficiently and the area has benefitted from innovation and creativity to develop new technology.

By developing the low carbon economy, the city is realising lower costs, retaining more money in the local economy and extracting maximum value from materials, recovering and regenerating component parts and materials at the end of life (promoting a circular economy).There is less dependency on energy and resources and the local economy is more resilient to change.

The present

The Council has defined the low-carbon economy as "economic activity that actively seeks to reduce carbon through products and services". Within Derby there is recognition of the importance of the low carbon economy in generating jobs and of having a sustainable economy that generates environmental benefits. Globally, the Low-Carbon Environmental Goods and Services sector (LCEGS) was worth £3.3 trillion in 2010-11, with the UK's share £122 billion. Global growth figures were 3.7% and UK growth was 4.7 % (BIS, 2012[9]). These figures show a well-performing sector in the midst of a global downturn, and this why Derby City Council, through its Economic Strategy (2011-2016)[10], has a commitment to pursue a low carbon economy and to realising the environmental and economic opportunities associated with reducing energy usage. These low-carbon ambitions underpin each one of the indicators within the Economic Strategy.

Studies have shown that Derby is well positioned to take advantage of the opportunities due to the technical capacity in the area and in 2010 Derby was listed in the top 5 cities for LCEGS sector employment[11].

There have already been developments within Derby and there are examples of 'blue-chip' companies taking advantage of the low-carbon market opportunities for example Bombardier has recent contracts for electric and hybrid trains and Rolls-Royce is working in partnership to deliver reactors for new nuclear power stations. There are also emerging support and collaboration forums that are focussed on, or related to low-carbon economy themes such as the Derby Carbon Initiative. Businesses are able to access support from a number of Council programmes which are supporting innovation (Enterprise Growth Fund), resource efficiency (Bespoke) and sustainable transport (Connected).

Derby also has existing skills and knowledge development opportunities through the University of Derby which has well-established climate change and environmental

[9] Department for Business, Innovation and Skills: LOW CARBON ENVIRONMENTAL GOODS AND SERVICES (LCEGS) report for 2010/11 (May 2012).

[10] http://www.derby.gov.uk/media/derbycitycouncil/contentassets/documents/strategies/DerbyCityCouncil-Derbys-Economic-Strategy-2011-2016.pdf

[11] Centre for Cities publication

management related courses and degrees, while Derby College is part of the National Skills Academy for Environmental Technologies (NSAET).

To fully take advantage of this sector and to help Derby realise opportunities in terms of emerging technologies and green jobs, collaborative work is on-going across Nottinghamshire and Derbyshire through the Local Economic Partnership (where Low Carbon Goods and Services is a priority sector within the Growth Strategy), Chambers of Commerce and other forums. In partnership with the University of Derby , Derby and Derbyshire Councils, are identifying the potential to enhance low carbon innovation and increase knowledge transfer between the universities and business to boost growth and productivity.

Moving Forward

For Derby to take advantage of the low-carbon economy there is a need to bridge the gap between the technical capacity, the knowledge that the area can benefit and taking practical action to ensure change. A key action will be to establish an understanding of how different businesses in Derby can relate to and take advantage of the supply chain of a low-carbon economy and access new markets

Actions

- Establish a partnership across the city and with regional bodies to promote the low carbon economy linking skills providers and developing peer to peer learning and innovation.
- Develop the Infinity Park and Innovation Campus to promote business growth, development and innovation.
- Continue to support small and medium sized businesses to access guidance and resources to improve resource efficiency and business resilience.
- Support and develop low-carbon skills, education, training and employment opportunities.

Smarter travel options

Local people and businesses choose to use a range of well provided for, easily accessible and integrated lower carbon travel choices.

Derby will be a city where:

- Land use planning enables people to live, work and access facilities and each other via walking, cycling or public transport,.
- People are able and willing to walk and cycle safely between their homes and places of work through a comprehensive cycle and walking network.
- People have access to an efficient and effective public transport system that they choose to use.
- There is a lower proportion of single car occupancy with increased car sharing and pool car initiatives.
- The availability of alternative sources of fuel is increasing and is being made more accessible (for example charging points in appropriate sites).

The present

The use of transport has a significant impact on carbon emissions with nearly a quarter of all Derby's greenhouse gas emissions resulting from transport. Although from 2005 to 2011 per capita emissions from transport fell from 1.7 tonnes to 1.5 tonnes however this remains higher than the larger neighbouring cities of Nottingham and Leicester.

Derby is a compact city which is conducive to many journeys being undertaken on foot, by bike and is generally well provided for in terms of sustainable travel choices.
This includes:

- some excellent, well used, safe, convenient and accessible walking and cycle infrastructure,
- a comprehensive hub and spoke bus network with current bus operators committed to improving services within Derby,
- accessible rail services with good public transport interchange.

This is supported by a robust approach to planning the future of the city in terms of land use and transport planning. This is reflected in the emerging Core Strategy, which underpins Derby's plans for economic development and housing growth 2028, and a 15 year transport strategy in the Local Transport Plan (LTP). Within these plans coordinated transport and land use planning aims to reduce travel requirements and facilitate behaviour change.

Reduction in travel requirements is also supported through the work of LightSpeed Derby. This is a partnership of organisations in Derby that has been working to bring high quality, reliable, affordable and consistent superfast broadband to the city.

The City Council has been successful in accessing funding including the Local Sustainable Transport Fund (LSTF), Better By Bus DfT award and Plugged in Places. These funding streams are supporting the testing and evaluation of a range of sustainable transport projects and will be used to demonstrate the impact of combining small scale infrastructure provision with complementary behavioural change activities.

The biggest and mostambitious project is the LSTF which seeks to encourage low carbon economic growth by increasing walking, cycling and public transport use. The £4.922 million programme delivered under 'Connected', has five integrated programme strands:

- Improve sustainable transport options for commuters and businesses.
- Encourage behaviour change through a smarter choices package
- Enable job-seekers to access employment at targeted sites

- Work with employers to support sustainable travel
- Ensure new developments build in sustainable travel options from the start.

Moving Forward

To address the impact of transport we need to tackle issues around infrastructure and planning to make sustainable transport choices attractive, integrated and accessible.

Actions

- Expand the range of high quality sustainable transport options for commuters and businesses.
- Ensure new developments build in sustainable travel options from the start.
- Work in partnership to invest and implement sustainable transportinfrastructure and initiatives across the city.
- Examine the potential for local alternative fuels and supply chains to diversify and decarbonise motor vehicle fuels.
- Use upgrades in the city's communications network to foster smarter, more efficient travel, and decrease the need to travel for meetings and to access services.

Energy Efficient Homes

Residents have homes that enable them to reduce their demand for energy and to be able to use energy efficiently.

Derby will be a city where there are established programmes, delivered at the local level, to support residents to live in low carbon homes and help them to make energy efficiency improvements and energy reduction choices.This support will be tailored to provide additional assistance to those residents in properties that are hard to treat and who at risk of fuel poverty.

Carbon emissions from homes have been reduced through:

- greater awareness of the benefits of living in an energy efficient home,
- improvements to efficiencies across the housing stock, new and old, private and public,
- wide scale implementation of energy efficiency measures such as cavity wall, loft insulation, and internal and external wall insulation, and
- wide scale implementation of small scale generation of renewable energy such as solar panels.

The present

Domestic emissions accounted for a third of the city's per capita emission in 2011. The SAP[12]energy efficiency rating of the housing stock across all tenures in Derby in 2010 was estimated to be 59 (out of 100), which was slightly higher than the national average. The SAP rating of social housing stock, managed by Derby Homes Ltd, at 72 was higher than the national average. As with the national picture, the private rented sector was the least efficient tenure.

Considerable efforts have been made in Derby to improve the energy efficiency of homes both within the private and public sector. Over the past 15 years significant home energy improvements have been made through Government schemes such as the Decent Homes Standard, the Warm Front Scheme, the fuel suppliers' Energy Efficiency Commitment, as well as local initiatives. Across the city the national Carbon Emission Reduction Target scheme was promoted and between March 2010 and December 2012 the Council worked in partnership with Dyson Insulations and Apex Carbon Solutions to install loft insulation to over 1,200 homes and cavity wall insulation to over 650 homes.

Improvements have also been made in recent years through the national Community Energy Saving Programme scheme, part funded by Eon. This scheme benefited both social housing and private sector housing:

Social housing stock:

- 622 solid wall insulation installations (458 internal and 164 external),
- 1,390 new central heating installations,
- 1,544 loft insulation installations and
- 265 solar PV installations.

Private sector housing:

- over 200 private households installing external wall insulation, and
- over 80 private households installing new energy efficient boilers.

Moving forward

[12] Standard Assessment Procedure (SAP) is the methodology used by the Department of Energy & Climate Change (DECC) to assess and compare the energy and environmental performance of dwellings.

Despite positive action and initiatives taking place in Derby, there is a need to continue to support hard to treat and fuel poor homes while at the same time encouraging those that are able to, to invest in home energy improvements including small scale renewable energy.

Actions

- Install solid wall insulation to all Pre War social housing stock and upgrade boilers to A or B rated condensing boilers in all Derby Homes housing stock.
- Ensure that local information and support is available for city residents to benefit from future national funding for home energy improvements and renewable heat installations.
- Implement initiatives to raise awareness and create action at a local neighbourhood level about energy efficiency, managing energy use and the benefits of installing renewable energy by providing information, advice and education.
- Work with developers to enable the city to meet the 2016 ‘zero-carbon’ building targets and deliver energy efficient homes
- Develop an ‘open homes’ network to enable residents to learn from one another on how to improve their home’s energy efficiency.

A secure local & renewable energy supply

Derby is able to reduce itsreliance on energy from fossil fuels through a locally generated, diverse, efficient and more secure energy supply.

Derby will be a city where local energy supply networks are established, utilising low carbon fuels. There is a mix of renewable energy installations which will aim to protect our economy and residents from energy shortfalls whilst significantly decarbonising our electricity supply.

Derby will have an integrated energy plan which:

- supports the establishment of smarter technology and local energy networks,
- tackles affordable and secure heating and electricity,
- promotes small and large scale renewable energy across homes and businesses,
- works to protect residents from rising fuel prices,
- reduces the city's reliance on energy from fossil fuels.

Derby will have policies integrated into planning policy that support and promote local energy production and distribution. This will work with developers to promote a diverse range of commercial and domestic heating and electricity technologies such as Combined Heat and Power, heat pumps, biomass boilers and other efficient applications.

The city will promote the development of a network of diverse heat and power sources including combined heat and power, renewable energy such as wind, solar and energy through anaerobic digestion and gas.

The present

Energy production is a significant source of carbon emissions across the country and within Derby. From household boilers to power stations there is a challenge ahead as prices rise alongside meeting national targets and carbon compliance. Government forecasts [13]show residential electricity prices rising by over 30% to 19p/KWh by 2020 and gas prices by 1p/KWh over the same period. This will place a further strain upon residents and those in fuel-poverty. It is therefore imperative that a coherent approach to energy management seeks to reduce reliance on fossil fuels, whilst protecting the security and price of supplies, and enabling users to use less energy overall.

Studies in the recent past (2009, 2011) have identified some of the technical renewable energy potential for both heat and electricity. The 2011 report[14], Low Carbon Energy Opportunities and HeatMapping for Local Planning Areas Across the EastMidlands, concludes that there is "significant potential for theuse of energy from waste … and wastewood." It identifies the potential installed capacity (MW) and generation capacity (GW/h) for electricity and heat.

The vision of a low carbon city, running on a district heating network is a complex and long term plan that will take a number of years to initiate and subsequent decades to develop. There is a heat map for the city which shows demand across the city, and further information available from the Department of Energy and Climate Change to show energy consumption

[13] DECC 2012 – Central Scenario - Annex F: Price Growth Assumptions. DECC Updated Energy & Emissions Projections - October 2012

[14]http://www.emcouncils.gov.uk/write/Emids-low-carbon-energy-opportunities-Final-Report-07-2011-update.pdf

and demand, whilst work is underway to understand the technical and financial viability of establishing networks across the city.

Renewable energy sources are being established across private homes, social housing and commercial premises in the city and this has been supported by the Government feed-in-tariff encouraging take up by businesses and homeowners. The Local Plan[15] supports planning permission for beneficial renewable energy and encourages developers to have full regard for conserving energy and generating energy from renewable sources. While at a national level the continuing Renewable Heat Premium Payment and forthcoming domestic Renewable Heat Incentive will offer opportunities for residents and developers to incorporate renewable heat in their properties.

Moving Forward

For Derby to develop a secure, diverse and affordable energy supply work will be carried out to develop a coordinated approach which ensures:

- Greater co-operation with businesses, communities and organisations within Derby to identify and exploit opportunities to develop local energy and renewable within the city.
- Better understanding of the capacity for local and renewable energy and how to engage both the domestic and commercial sectors

Actions

- Develop an Energy Policy for the city.
- Develop a coordinated approach to energy and heat planning and management for the city.
- Promote and support renewable heating and electricity generation in line with the national 15% target for 2020 and the national Renewable Energy Roadmap
- Develop regional partnerships to attract investment into, and secure research to provide evidence for decentralised energy initiatives.
- Establish developments, small and large, that utilise and support renewable and local energy supply.

[15] http://www.derby.gov.uk/media/derbycitycouncil/contentassets/documents/policiesandguidance/planning/9%202006%20Environment%20.pdf

Being prepared for a changing environment

Derby is able to plan, measure and respond proactively to the effects of climate change and the implications of resource scarcity.

Derby will be a city where businesses, organisations and local people are prepared for the changes in our climate and the extreme weather events they are likely to bring. Derby will be prepared for a changing climate and plans are in place to enable the city to cope with, respond to and take advantage of any opportunities from climate change.

The city has built an understanding of what weather events and trends we are likely to experience. This is used to predict changes and impacts and allow adaptation through planning, design and education.

New development and regeneration within the city is planned to ensure buildings, infrastructure and open spaces incorporate adaption and mitigation measures to reduce carbon emissions and to manage climate change risks. Measures such as sustainable drainage systems, efficient water usage and retention, green infrastructure, effective use of insulation and ventilation in buildings and defences to protect the city centre infrastructure from river flooding are in place.

The city will be ready for changes in resource availability. Derby will be a city that uses resources efficiently, makes use of local sustainable supplies, and turns waste into useful products, embracing the Circular Economy. This will ensure Derby is a more resilient city that has the capability to adapt its services, economy and activities to both the changes to the climate and in resource availability.

The present

Work with regional and national partners is being carried out to build a better understanding of how well the city is adapting to climate change and to gauge the level of resilience to current and future climate and weather scenarios. The Council is also working with other local partners in the public sector through the Local Resilience Forum to ensure it can respond appropriately to the impacts of severe weather events and protect residents and property.

In 2008, Derby City Council formally began work on climate change adaptation using the framework of National Indicator 188 (NI 188) - Planning to Adapt to Climate Change, to manage progress and has an adaptation action plan for its services. The action plan addresses key risks highlighted in the climate change risk assessments which were undertaken on Council services.

A major flood defence scheme is currently being developed which will both protect the city from future significant flooding events and regenerate the river corridor in the heart of the city.

Moving Forward

Work is being done across the city by different organisations to adapt on an individual level however at a city level there needs to be a more holistic approach, greater knowledge about

the impacts at a local level on services, organisations and neighbourhoods, sharing of that information and joint working on strategic decision making and developments.

Actions

- Build links to the city partnership and createhigh-level policy and guidance to ensure climate adaptation is considered in decision making.
- Establish systems to develop and share knowledge about the impacts and practical action that can be taken amongst services, organisations and neighbourhoods.
- Create ‘live’ domestic and commercial adaptation research projects leading to greater levels of resources, knowledge transfer and cost-savings for local economy.
- Build partnerships to share knowledge, expertise and funding which promotes best practice and develops new tools for adaptive design, behaviour and technology as well as the monitoring of the costs of weather events and cost-benefit analyses for major interventions.

An active community

Local people and businesses have access to skills and learning opportunities that lead to positive action on climate change, collaboration and changes in behaviour.

Derby will be a city where communication, education and awareness programmes are in place to:

- create and change individual action which makes low carbon activities part of the 'every day', empowering people to take action, addresses the value-behaviour gap and creates the public political engagement to push for change in Government and business,
- support the development of skills and knowledge to continually develop and take advantage of new technologies,
- support community, corporate and educational establishments to interact, share information and resources, and
- enable public opinion to play an important role in influencing political and corporate responses to climate change.

The present

Nationally there is public understanding about climate change and the need to take action and Government bodies, corporate and third sector organisations have all acknowledged the need to act on climate change. However it is recognised that the gap between attitude and behaviour is still relatively high; even if people and organisations are concerned, they continue to act in a way that will contribute to climate change or to environmental harm.

Within Derby there are a number of existing bodies which play an important role to promote, educate and engage the public on climate change as well as business organisations that are investing within the low carbon economy. This includes educational establishments such as Derby College and the University of Derby with well-established courses and expertise, voluntary organisations with direct and indirect roles such as Transition Derby and business groups such as the Derby Carbon Initiative.

Within schools environmental education is addressed through the core sciences although climate change is not currently mandatory, and 65 schools within Derby are working within the Eco Schools award programme which aims to promote environmental awareness and action.

Moving forward

To create an environment of proactive action there needs to be a coordinated but diverse programme of initiatives that raises awareness and supports organisations and individuals.

Actions

- Develop core messages focussed on different audiences that can be used to help engage groups and individuals.
- Develop a city wide action plan for communicating climate change and supporting practical initiatives.
- Improve coordination of climate change networks and interest groups to bring together organisations working on environmental/climate change action.
- Build on existing educational strengths and promote knowledge transfer through placements and research.