

DERBYSHIRE COUNTY COUNCIL

22 JANUARY 2013

CABINET

**Report of the Deputy Chief Executive and Strategic Director of Policy and Community Safety, and
the Strategic Director for Environmental Services**

DERBYSHIRE CLIMATE CHANGE ADAPTATION ACTION PLAN

Purpose of Report

To seek approval to adopt the Derbyshire County Council Adaptation Action Plan as the corporate strategy to build resilience to climate change across Derbyshire.

Background

Adaptation to climate change is recognised within Derbyshire's Sustainable Community Strategy 2009-2014 and the Council Plan 2010-2014. Adapting to climate change is a key component in ensuring a sustainable future for Derbyshire and the County Council, with a changing climate likely to affect the ability of the County Council to deliver its services. Assessing the potential risks and planning to build more resilient communities in the face of such challenges makes both environmental and economic sense.

Information and Analysis

Derbyshire County Council approached the adaptation agenda with the regional climate change partnership Climate East Midlands (CEM). Through the CEM projects Planning to Adapt (2008-11) and Well Adapting East Midlands (2011-12) local authorities throughout the East Midlands focused on embedding adaptation, using NI 188 (the relevant national driver at the time) as guidance. In achieving level 3 of NI 188 Derbyshire County Council produced the following:

- Local Climate Impact Profiles (LCLIP)
- Comprehensive Climate Change Risk Assessments (CCRA)

These studies revealed a range of potential risks to County Council services as a result of climate change, including flooding to buildings and the cost of winter highways maintenance.

Building on the LCLIPS and CCRA, the Adaptation Action Plan outlines the actions required and progress already made in developing climate resilient services within the Council. Whilst facilitating the work being carried out across the organisation on climate change resilience, the Adaptation Action Plan also forms the first stage in a process of developing a system of implementation, monitoring and evaluation.

The Action Plan was developed through a series of meetings with service managers. Many of the actions have been developed specifically for the Action Plan, whilst others are occurring independently but are still considered to contribute to building resilience to climate change.

The five key areas of focus as identified in the action plan are:

- Minimising flood risk
- Infrastructure
- Building resilience in service delivery
- Adapting the built environment
- Community resilience planning

The Action Plan will be monitored and reviewed quarterly through the Corporate Derbyshire County Council Environmental Sustainability Group.

Next Steps

The Action Plan will continue to be updated in line with progress in the authority, national legislation and scientific advances. Derbyshire County Council will continue to work alongside regional partners and leading research organisations to:

- Develop social and economic evidence bases for adaptive actions
- Develop indicator sets to monitor and evaluate progress on adaptation, in particular through a project led by Climate East Midlands and the Environment Agency (currently running until March 2013) involving research into current and potential indicators available to Local Authorities in the East Midlands.

Key Decision

No

Officers Recommendations

It is recommended that Cabinet:

- Adopts the Adaptation Action Plan as the corporate strategy for building resilience to climate change .
- Notes the continued work moving forward (with Climate East Midlands) to develop climate change adaptation indicators.

David Lowe

Deputy Chief Executive and Strategic Director – Policy and Community Safety

and

Ian Stephenson

Strategic Director – Environmental Services

Executive Summary

Welcome to the Derbyshire County Council Adaptation Action Plan. This document outlines the County Council's strategy to adapt to future climate change and build resilience within its service delivery and the Derbyshire community.

Adaptation to climate change is recognised within Derbyshire's Sustainable Community Strategy 2009-2014¹ and the Council Plan 2010-2014². Adapting to climate change is a key component in ensuring a sustainable future for Derbyshire and the County Council.

There is now general acceptance that our climate is changing, and mainstream science including the 4th Assessment Report by the United Nations Intergovernmental Panel on Climate Change (IPCC)³ identifies human activity relating to the burning of fossil fuels as the main driver of this change.

There are a number of potential risks and opportunities arising where climate change impacts upon our environmental, social and economic systems. The County Council has a critical role to play in working with partners and communities to plan and ensure Derbyshire is prepared and resilient to climate change.

The Adaptation Action Plan outlines the actions required and progress already made in developing climate resilient services within the Council. Whilst facilitating the work being carried out across the organisation on climate change resilience, the Adaptation Action Plan also forms the first stage in a process of developing a system of implementation, monitoring and evaluation of climate adaptation actions.

Following meetings with relevant managers and taking the findings of the Climate Change Risk Assessment⁴ process into account, this Action Plan has been divided into five sections, as set out below.



¹ The Derbyshire Partnership Forum Sustainable Community Strategy 2009-2014

http://www.derbyshire.gov.uk/images/Derbyshire%20Sustainable%20Community%20Strategy%202009-14_tcm44-97547.pdf

² Derbyshire County Council - Council Plan 2010-2014

http://www.derbyshire.gov.uk/images/Final%20Draft%20of%20Council%20Plan_tcm9-137291_tcm44-138564.pdf

³ Download the IPCC 4th Report http://ipcc.ch/publications_and_data/publications_and_data_reports.shtml

⁴ See appendix 1 for a summary of the key risks to Derbyshire County Council as identified through the risk assessment process.

The Derbyshire County Council Adaptation Action Plan contains two main sections, firstly the **Introduction to Adaptation**, outlining the agenda in a Derbyshire County Council context and finally an overview of the **Adaptation Actions** the Authority is taking.

Introduction to Adaptation

Adaptation – ‘adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects. Adaptive actions are those which can moderate harm or exploit beneficial opportunities’.

What is adaptation?

The IPCC suggests that increasing global temperatures relating to human fossil fuel activity is causing our climate to change⁵. The changing climate means that we will experience more extreme weather events, and changes in seasonal patterns. These changes in the natural environment will have an impact upon social and economic systems. Adaptation means increasing resilience and reducing vulnerability to future unavoidable climate change.

It is important to remember that adaptation is not just about reducing the potential threats of climate change but also embracing environmental, social and economic opportunities.

Adaptation has significant benefits beyond its primary purpose of increasing resilience to climate change. Many adaptive actions, particularly adapting through natural interventions⁶, can be described as ‘win-win’, or measures that provide additional environmental, economic and health paybacks as well as managing climate impacts. Actions such as rainwater recycling and intelligent building design can increase resilience to future climatic events, but also reduce our current consumption of resources, thus providing immediate financial returns.

Derbyshire County Council has engaged in the adaptation agenda using two key approaches:

Building Adaptive Capacity

- Raising awareness of climate change and its associated impacts. Providing training and educating both Council staff and the general public about the dangers of climate change and the possible methods to increase resilience to its impacts.

Delivering Adaptive Actions

- Implementing strategies that directly increase resilience to, or take opportunity of future climate change.

Uncertainty in predicting the level and impacts of future climate change presents a degree of risk associated with planning adaptation. Building adaptive capacity within the County Council and the wider Derbyshire community will mean key decision makers have an

⁵ See Appendix 2 for the IPCC global temperature projection graph

⁶ Climate East Midlands and AECOM report ‘Adapting through Natural Interventions’ available for download http://www.climate-em.org.uk/images/uploads/Adapting_through_natural_interventions_final_low_res.pdf

improved understanding of the risks and uncertainties of climate change and can implement adaptive measures effectively.

National policy on climate change

The **Climate Change Act 2008**⁷ provides a legally binding framework for ensuring that the UK Government meets its commitment to tackle climate change. The Climate Change Act sets the legal policy framework for climate change adaptation through the following:

1. Conduct a 5 yearly UK Climate Change Risk Assessment (CCRA) and National Action Plan (NAP). The first CCRA was released in January 2012.
2. The Government has the power to ask all organisations with a statutory obligation, including Local Authorities, to report on how they have assessed the risk of climate change and what measures they have taken to address the risks.

The Derbyshire Partnership Forum signed up to **NI 188**, as part of its 2008-2011 Local Area Agreement. In October 2010 all National Indicators were effectively 'localised' meaning that Local Authorities could govern their own progress on the agenda. Local Authorities working on NI 188 were encouraged to continue their work to embed adaptation into service delivery. Hence Derbyshire County Council along with other Authorities engaged in the Well Adapted East Midlands (WAEM) project which continues to use the defunct NI 188 as guidance.

In 2001 Derbyshire County Council became a signatory to the **Nottingham Declaration**⁸. The Declaration commits the Authority to reduce its carbon emissions, support Derbyshire communities to address the causes of climate change and become more resilient to its potential impacts. The Nottingham Declaration is set to be replaced by the new **Climate Local** Commitment. The Committee on Climate Change will provide advice on the role that Councils have in delivering national carbon budgets, identifying and quantifying where Councils can make the biggest difference. Through Climate Local, Councils can declare their support and set self-imposed carbon reduction targets and goals

The **Adaptation Sub-Committee** (ASC) was created in June 2009 under the Climate Change Act 2008. It is an independent body with a statutory obligation to advise the government on adaptation, its objectives are:

1. To develop an indicator framework.
2. To input into the government's economic analysis of adaptation and development of the NAP.
3. To review lessons for the next CCRA.

How will climate change affect Derbyshire and the County Council?

Prior to the development of the Adaptation Action Plan, Derbyshire County Council has undertaken two projects, **Local Climate Impact Profiles** and **Climate Change Risk Assessments** to identify the impacts of climate change.

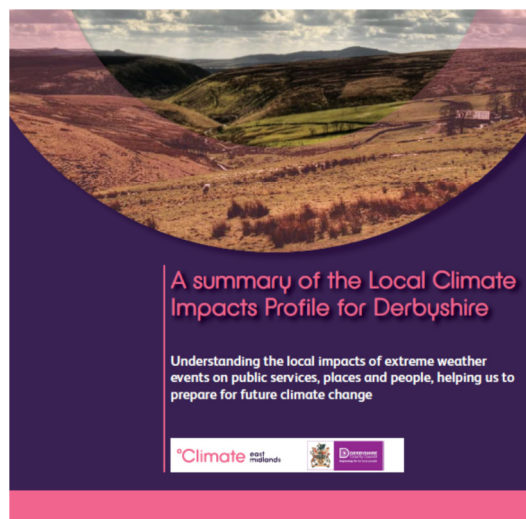
⁷ More information on the Climate Change Act 2008 is available from http://www.decc.gov.uk/en/content/cms/legislation/cc_act_08/cc_act_08.aspx

⁸ More information on the Nottingham Declaration available from http://www.local.gov.uk/web/10161/topic-climate-change/-/journal_content/56/10161/95708/ARTICLE-TEMPLATE

Derbyshire County Council has worked with Climate East Midlands to produce **Local Climate Impact Profiles**⁹ (LCLIP) for the Authority, LSP and District/Borough Councils. The Derbyshire LCLIP report was produced in 2010 (revised in 2012) as part of the Climate East Midlands WAEM Project. It identified the extreme weather events in Derbyshire over a 10 year period (2000-2010) and outlined how the County Council and LSP managed these events.

The key findings of the Derbyshire LCLIP are:

1. During the recorded period the County Council spent £6.7million on extreme weather events.
2. There was significant strain on County Council resources, in terms of both finances and staff time during periods of extreme weather events.
3. The Highways division was Derbyshire County Councils service most frequently affected by extreme weather events.
4. Geographical variation such as a prominence of pluvial (overland) flooding in the North, with (river) flooding in the South.



All services within Derbyshire County Council have produced **Climate Change Risk Assessments**. The risk assessment process, developed by Climate East Midlands as part of the 2009/11 Planning to Adapt Project involved each service identifying how climate change impacts will affect the County Council and service provision over the time slices 2020s, 2050s and 2080s.

Climate Change Projections

The Government funded UK Climate Impacts Programme, has used models to try to predict the effects climate change will have in the UK. The latest **UK Climate Projections 09** (UKCP09)¹⁰ provides information on how the UK's climate is likely to change based on various (high, medium and low) greenhouse gas emissions scenarios. Using UKCP09 data the Derbyshire Partnership Forum has commissioned its own Derbyshire Climate Projections¹¹ that the Authority has used to plan for future climate change.

Climate Variable	<u>1961-1990</u> (average)	<u>2020</u> (central estimate)	<u>2050</u> (central estimate)	<u>2080</u> (central estimate)
Average Summer Temp	15.1 °C	16.5 °C	17.6 °C	18.6 °C
Average Winter Temp	3.6 °C	4.9 °C	5.8 °C	6.5 °C
Average Summer Precipitation	1.78mm	1.8mm	1.5mm	1.5mm

⁹ Derbyshire Local Climate Impact Profile available from <http://www.climate-em.org.uk/images/uploads/Derbyshire-web.pdf>

¹⁰ UK Climate Projections UKCP09 <http://ukcp09.defra.gov.uk/>

¹¹ Derbyshire Climate Change Projections are available on CD by request climate.change@derbyshire.gov.uk

Average Winter Precipitation	1.62mm	2.2mm	2.4mm	2.5mm
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The table shows the climate projections for Derbyshire based on a medium emissions scenario.

Broadly speaking the Derbyshire projections show that the county will experience **hotter drier summers** and **warmer wetter winters**.

Adaptation Actions

Actions within this Adaptation Action Plan were formulated through a combination of discussions between managers and the Climate Project Officer regarding the climate change risk assessments, and actions that services were independently planning and operating. This process started during the Climate East Midlands 2009-2011 Planning to Adapt Project, as such the Action Plan contains some actions that have already been completed, this is visible in the 'Progress' column. It is important that the Action Plan includes completed actions as it shows the time line of progress of work on adaptation within the County Council and will help to maintain momentum on this agenda.

Minimising Flood Risk

River (fluvial) flooding and increasingly flash (pluvial) flooding, pose a threat across Derbyshire. Flooding has impacted upon the county on numerous occasions in recent years, with two of the more severe recent floods occurring in Hatton in November 2000, and in Chesterfield in June 2007. In addition to these events, the Climate Change Risk Assessment process identified flooding as the climatic variable posing the most significant threat to Council services within the 2020s time slice (2010-2039). Much of the work within this Action Plan relating to flood risk is driven by the Flood Water Management Act 2010. As the Lead Local Flood Authority (LLFA) within Derbyshire, the County Council coordinates a number of partner organisations with various responsibilities. Key partners include the Environment Agency, District and Borough Councils, Parish Councils, water companies, emergency services and land owners. District and Borough Councils play a vital role in planning flood risk management and they are also responsible for authorising most planning applications in Derbyshire, which can directly shape the resilience of our future landscape.

Infrastructure

There are two key aspects of national infrastructure that the County Council has the opportunity to influence at the local level – transport infrastructure and green infrastructure. Our transport infrastructure is of vital importance to many aspects of life – from a free-flowing road network that is relied upon by emergency services responding to call-outs, to the daily commute to work and public transport. Our green infrastructure, including parks and open spaces, provide social, economic and environmental benefits to our communities, and in addition, provides opportunities for the implementation of natural interventions to minimise the impacts of climate change.

Building Resilience within Service Delivery

The Comprehensive Risk Assessments undertaken by each of the County Council's key services identified several vulnerabilities to the likely impacts of climate change. These vulnerabilities range in importance and severity, with some requiring early action to ensure Council services can continue to be delivered without climate related disruption.

Adapting the Built Environment

County Council properties are used for an array of purposes, including the provision of care homes for the elderly and schools for children. Projections suggest that our climate is likely to have changed considerably by the end of the twenty-first century; hence it is important to ensure that buildings are designed, retrofitted and rationalised in a way that ensures resilience to a changing climate for their whole lifetime.

Community and Business Resilience Planning

The County Council is committed to supporting Derbyshire communities and businesses to increase their resilience to the threats that climate change poses. This includes effectively communicating the threat of severe weather events to residents before they occur, and providing advice and support to residents to increase their resilience. Derbyshire County Council will also work with partner organisations such as Climate East Midlands and the Environment Agency who have direct experience in developing business resilience. It is important that businesses in Derbyshire are made aware of the opportunities as well as threats that a change climate presents.

What's next for Derbyshire?

In order to progress the adaptation agenda and increase resilience Derbyshire County Council will continue to work with regional partners and research organisations to develop an evidence base for the social and financial gains that can be achieved by adapting to climate change. This evidence base will be used to legitimise future investment of resources into building climate change resilience.

Work has already begun to develop adaptation indicators for both Derbyshire County Council and at regional level in association with Climate East Midlands and the Environment Agency. Developing an indicator set will be important not only to monitor the Authorities progress on adaptation, but also to provide a framework for continual development and improvement of the adaptation agenda across Derbyshire.

Through the Environmental Sustainability Group the Adaptation Action Plan will be monitored and updated quarterly in line with progresses within the Authority, changes in climate science and advice from research organisations and Central Government.

Theme	Key Tasks and Actions	Priority	Timescale	Resources	Progress	Responsibility
Minimising Flood Risk						
Ensure an effective approach to flood risk management is taken	Continue to maintain and facilitate the Derbyshire Strategic Flood Board as the coordinating body for work on this agenda.	Medium	Ongoing	Officer time		Lead: Derbyshire Strategic Flood Board (SFB) Others: Emergency Planning; Highway Asset/Flood Risk Management
	Support the Derbyshire Local Resilience Forum to maintain and review the multi-agency flood contingency Plan, following experience gained from exercises or actual flooding incidences.	Medium	Ongoing	Officer time		Lead: Emergency Planning Others: Local Resilience Forum Member Organisations.
	Support the Technical Officers Flood Risk Group in promoting collaborative working with numerous Risk Management Authorities.	Medium	Ongoing	Officer time		Lead: Highway Asset/Flood Risk Management
	Produce Derbyshire's Preliminary Flood Risk Assessment, in accordance with European Directives.	High	May 2011	Officer time	Completed	Lead: Highway Asset/Flood Risk Management
	In line with the requirements of the Flood and Water Management Act, Develop a Local Flood Risk Management	High	Dec 2013	Officer time		Lead: Highway Asset/Flood Risk Management Others: Emergency Planning

	Strategy.					
	Consider the management of >10,000 m ³ reservoirs in line with changes to FWMA	Medium	Ongoing	Officer time; Funds to be identified		Lead: Countryside Service, Emergency Planning
	Derbyshire County Council to act as SUDs approval body for Derbyshire		October 2013	Officer time		Lead: Highway Asset/Flood Risk Management
Raise awareness on responsibilities related to flooding, and possible adaptive responses, in preparation for the implementation of the Flood and Water Management Act.	Deliver two workshops on 'Building Resilience to Climate Change through Water Management.'	Medium	February 2011	Officer time; RIEP funds for delivery of event	Completed	Lead: Policy and Research Division Others: Environment Agency; Derbyshire Partnership Forum (DPF); SFB
	Use issues raised at water management workshops to determine future Plans and prioritise early action.	Medium	Ongoing	Officer time		Lead: Policy and Research Division; Emergency Planning Others: Environment Agency; DPF; SFB
Carry out flood studies to improve knowledge of vulnerabilities across Derbyshire	Commission detailed modelling (in partnership with the Environment Agency) of surface water flooding, 'flood	High	June 2012	Officer time	Completed	Lead: Highway Asset/Flood Risk Management Others: Environment Agency, Emergency

	hotspots' within Derbyshire					Planning; SFB
	Map historical flood events using GIS.	Medium	In line with 3CAP Action Plan	Officer time	Ongoing	Lead: Highway Asset/Flood Risk Management
	Produce a Derbyshire flood risk register.	Medium	In line with 3CAP Action Plan	Officer time	Ongoing	Lead: Highway Asset/Flood Risk Management
	Carry out pilot drainage schemes, in Chesterfield and South Derbyshire.	Medium	In line with 3CAP Action Plan	Officer time; Funds to be identified		Lead: Highway Asset/Flood Risk Management
	Continue the flooding research already being carried out by DCC, with input from a range of partners.	Medium	Ongoing	Officer time		Lead: Highway Asset/Flood Risk Management Others: District Authorities, including Land Drainage Officers, Environmental Health Officers and District Planners.
Developing our Infrastructure						
Develop potential FRM schemes for Surface Water, Ground Water and Ordinary Watercourses	Promote schemes for funding through partnership, FDGIA and Local Levy	High	2013/17	Officer time	Ongoing	Lead: Highway Asset/Flood Risk Management Others: Emergency Planning
Raise awareness about ways of adapting Derbyshire's green infrastructure to increase	Deliver the 'Adapting through Natural Interventions' project findings in a workshop to officers from the County	Medium	October 2010	Officer time; RIEP funds for facilitation of workshop	Completed	Lead: Policy and Research Division Others: AECOM; DPF

resilience to climate change	Council and other DPF organisations.					
Support an increase of tree coverage across Derbyshire communities.	Promote and deliver the 'Free Tree Scheme,' providing schools and community groups the opportunity to Plant within appropriate areas.	Medium	Ongoing	Officer time		Lead: Countryside Service
Invest in asset management and location reviews, carry out drainage surveys, and improve the knowledge of drainage assets, hydraulic capacity and ownership	Require the logging of officer knowledge of drainage assets. Produce Register of "Flood Critical" assets as required by FWMA.	Medium	In line with 3CAP Action Plan	Officer time		Lead: Highway Asset/Flood Risk Management
	Carry out a pilot study to determine the nature of gully improvements required.	Medium	In line with 3CAP Action Plan	Officer time	Completed	Lead: Highway Asset/Flood Risk Management
Improve Highways Division budget management arrangements during periods of extreme winter weather.	Create a £2 million winter maintenance reserve to cover extremes of winter weather.	High	Active from April 2011.	Funds required to establish the reserve.	Completed	Lead: Environmental Services
Ensure improvement to the transport infrastructure place an emphasis on resilience to climate change.	Strengthen the policy objectives on climate change adaptation and the improved resilience of the transport network within the next Local Transport Plan (2011-2026)	Medium	April 2011	Officer time	Completed	Lead: Highways Division

	Monitor and evaluate progress with adaptation in line with 3CAP report through LTP Programme Development and Programme Management Groups	Medium	Ongoing	Officer time		Lead: Highways Division
Building Resilience within service delivery						
Further develop the County Council's corporate approach to tackling climate change.	Add climate change to Council committee report considerations.	High	September 2011	Officer time	Completed	Lead: Environmental Sustainability Group Other: Policy and Research Division
	Departmental Service Plans to include a commitment to reduce carbon emissions and adapt to the impacts of climate change.	Medium	March 2012	Officer time	Completed	Lead: Environmental Sustainability Group Other: Policy and Research Division
	Provide assistance to departments to consider the impacts of climate change in developing Service Plans.	Medium	Ongoing	Officer time	Completed: To be reviewed annually	Lead: Policy and Research Division Other: All departments
	Develop adaptation indicators sets to monitor the progress and effectiveness of adaptation	High	March 2013	Officer time		Lead: Policy and Research Other: Climate East Midlands, Environment

	within Council services.					Agency
Raise awareness about the threats posed by climate change, and the need to embed climate change in decision-making processes.	Produce a Climate Change Projections report for Derbyshire, using the UKCP09 data.	Medium	January 2011	Officer time; RIEP funds for research and production of report	Completed	Lead: Policy and Research
	Distribute copies of the Climate Change Projections report to relevant Council departments, and to partner organisations.	Medium	April 2011	Officer time; RIEP funds to distribute report	Completed	Lead: Policy and Research Division
	Delivery of 2 Sustainability Training sessions for DCC employees. (A further 8 sessions could be available if the training contract is re-let).	Medium	September 2013	Funds for delivery of training sessions through Council Sustainability budget.	Three sessions completed Further sessions Planned	Lead: Policy and Research Division Other: PDNPA Learning and Development team
Ensure that all County Council departments have policies and procedures in place to deal with the threats of severe weather. Develop improved “early warning” link with the MET Office.	Review relevant departmental Business Continuity Plans to ensure they allow scope for responding to all emergency situations caused by severe weather.	Medium	Ongoing	Officer time		Lead: Emergency Planning Division Other: All departments
Work in partnership to ensure the efficiency and	Continue sharing resources and knowledge with regional	High	Ongoing	Officer time; Funding through	Completed WEAM	Lead: Policy and Research

effectiveness of actions are maximised	counterparts as part of the Well Adapting East Midlands project (WAEM).			EM Climate Change Skills Fund for Project Officer	project. Continuing engagement with CEM	Division Other: Climate East Midlands
	Provide the Independent care sector with knowledge of flood risk and support them with Action Planning. Develop a pilot project in a residential home.	Medium	Ongoing	Officer time		Lead: Adult Social Care Other: Policy and Research
	Direct all existing and new care contractors to 'Weathering the Storm' and the Energy Monitoring loan scheme.	Medium	Ongoing	Officer time		Lead: Adult Social Care
	Utilise the DPF's new governance arrangements, to deliver a partnership approach to building resilience to climate change within Derbyshire.	Medium	Ongoing	Officer time		Lead: Policy and Research Division Other: All DPF CC Sub Group reps.
Adapting the Built Environment						
Raise awareness about adapting the built environment to climate change	Provide bespoke climate change adaptation workshops for Planners, Surveyors and Designers.	Medium	Ongoing	Officer time		Lead: Policy and Research Division Other: Corporate Property; Environmental Services
Work to increase resilience of building stock through property rationalisation and	Explore the possibility of including adaption indicators in service property review questionnaires.	Medium	Ongoing	Officer time		Lead: Policy and Research Division Other: Corporate Property

retrofit	Explore the potential for including adaptive options derived from the Corporate Property comprehensive risk assessment in to the Asset Management Plan.	Medium	Ongoing	Officer time		Lead: Policy and Research Other: Corporate Property
Work to increase resilience of new developments	Produce an adaptation checklist for Planners, Surveyors and Designers. E.g. Adopt SUDs	High	March 2013	Officer time		Lead: Policy and Research Other: Corporate Property, Environmental Services
Community and Business Resilience Planning						
Provide the public with advice about severe weather forecasts, and recommendations for appropriate action	Promote Derbyshire Prepared website to include information on severe weather forecasts, and to provide advice to the public on resilience measures. Develop flood risk information available on County Website	High	Ongoing	Officer time		Lead: Highway Asset/Flood Risk Management Other: Local Resilience Forum
	Upload the Derbyshire Projections Report on to the County Council website and make available for public loan via libraries.	Medium	March 2013	Officer time		Lead: Policy and Research Division Other: Cultural and Community Services; EContent
Engage businesses in the climate change agenda	Upload 'Weathering the Storm' (a business guide to climate change adaptation) onto the Derbyshire Prepared and County Council websites.	Medium	Ongoing	Officer time	Completed for Derbyshire Prepared	Lead: Emergency Planning Other: Policy and Research Division; EContent

	Provide copies of 'Weathering the Storm' to local businesses through the SME Energy Monitor loan scheme.	Medium	Ongoing	Officer time; RIEP funding for printing of document.		Lead: Policy and Research Division Other: Cultural and Community Services
Ensure organisations delivering Council contracts consider developing resilience to climate change within their business continuity Plans.	Include climate change adaptation as a criterion within the Commercial Questionnaire, which forms part of the tendering process for contracts with the County Council.	Medium	Ongoing	Officer time.		Lead: County Procurement Other: Policy and Research Division
	Ensure each tenderer to the County Council is signposted to 'Weathering the Storm.'	Medium	Ongoing	Officer time.		Lead: County Procurement Other: Policy and Research Division

Appendix 1 – Summary of Derbyshire County Council Departmental Climate Change Risk Assessments

© East Midlands NI 188 Planning to Adapt Project							
NI 188 Planning to Adaptation to Climate Change: Summary Risk Assessment of the impacts of future climate change on the delivery of Derbyshire County Council's services							
Ref No.	Future climatic condition	Impact	Identified Risk and / or Opportunity	Consequence	Service Area Affected	Current Risk Rating (2020s)	Future Risk Rating (2050s)
	Increasing summer	Higher summers	Maintaining thermal comfort in summer months is more of a challenge - higher temperatures in classrooms / workplaces / DCC-run homes	Complaints from members of staff about working conditions and reduced employee productivity due to thermal gain	All Departments	Medium	High
				Closure or partial closure of Council buildings, particularly temporary accommodation and accommodation for vulnerable people	All Departments, particularly Corporate Property and Adult Care. Possible disruptions to service users	Medium	Very High
				People suffering from increased heat related conditions (e.g. heatstroke)	All Departments	High	High
			Overheating of transport infrastructure	Structural damage to infrastructure eg. Buckling train tracks / melting roads with possibility of injury and death	All Departments, particularly Public Transport, Highways Fleet and Emergency Planning	Medium	High
			More uncomfortable living / working conditions	Increased frequency of dehydration / heat stroke among vulnerable groups	All Departments, particularly Emergency Planning and Adult Care	High	Very High
			Damage to buildings through increasing populations of insects (e.g. Longhorn beetle, termites, and a potential increase of tropical insects) - particular concern for historical buildings.	Closure or partial closure of Council buildings, particularly temporary accommodation and accommodation for vulnerable people	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	High
			Degradation of building materials	Closure or partial closure of Council buildings (if severe degradation)	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High

	temperature	temperatures and heatwaves	Increasing hours of sunshine	People suffering from increased sun related conditions (e.g. sunburn, sunstroke)	All Departments, and risks to public health	Medium	High
			Changes to subsoil conditions affecting foundations leading to structural damage	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High
				Health and safety risks (e.g. structural damage)	All Departments, and risks to public health	Medium	High
			Fire	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High
				Health and safety risks to service users	The Countryside Service, and risks to public health	High	High
			Temperatures in care homes could become too hot (day and night-time temperatures)	Potentially very serious health consequences for service users	Adult Care, Emergency Planning and Corporate Property	Very High	
				Could also affect health of staff	Adult Care, Emergency Planning and Corporate Property	High	
			Temperatures in houses for vulnerable adults supported to live in their own homes could become too hot.	Potentially very serious health consequences for service users	Adult Care and Emergency Planning	High	
				Could also affect health of staff	Adult Care	High	
			Hot indoor temperatures; temperatures too high in server rooms	Servers going down - failure to respond effectively to a major business interruption and social workers unable to open files	All Departments, particularly CAYA and Adult Care	Very High	Very High
			Increased hospital admissions	Pressure on care services	Adult Care, Emergency Planning and risks to public health	Medium	High
			Change in exotic species ranges	Increase in blue green algae affecting water supply	Emergency Planning and Countryside Service	Medium	High
			Increase in animal diseases e.g. Blue tongue / avian flu / foot & mouth	Need for mass vaccination of livestock	Emergency Planning	Medium	High

			Reduced flow rates of water courses	Severe low flow or drying up of water courses	Land Drainage	Medium	High
	Increasing winter temperature	Milder winters	Increase in pest species	Agricultural losses	Emergency Planning	Medium	High
		Frost / Ice / Snow	Disruption on the roads by frost snow and ice causing hazardous driving conditions	Increased need for fleet gritters to grit roads in icy conditions	Highways Division	High	Medium
				Increased workload for gritter drivers	Highways Division	High	Medium
				Increased demand for resources such as salt to grit the roads	Highways Division, Emergency Planning	High	High
				Increased demand for snow ploughs	Highways Division	High	Medium
				Increased incidents of RTCs	Highways Division, Emergency Planning, and risks to public health	Very High	High
				Services may become unable to deal with periods of frost snow and ice if winter maintenance is downgraded as a result of milder winters	Highways Division	High	High
				Decreasing summer precipitation	Drought	Changes to subsoil conditions affecting foundations leading to structural damage	Closure or partial closure of Council buildings to allow remedial repairs
	Health and safety risks (e.g. structural damage)	All Departments, and risks to public health	Medium			High	
	Less water for agriculture	Loss of food supply	Emergency Planning		Medium	High	
	Drier soil conditions leading to structural damage	Increased subsidence leading to damage / collapse of buildings	All Departments, particularly Corporate Property and Emergency Planning and possibly risk to public		Medium	High	
		Damage/collapse of mineral workings/ disused landfill sites leading to potential methane release	Emergency Planning		Medium	High	
			Structural damage of property as a result of flooding	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	High	Very High

	Increasing winter precipitation	Periods of heavy and / or persistent rain leading to Pluvial flooding (flash floods from rainfall) / Fluvial flooding (river flooding) / Damp and / or water logged soils	Pluvial flooding (flash floods from rainfall) and fluvial flooding leading to soil erosion of cover systems (contaminant specific)	Contaminants are mobilised resulting in risk to human health and environment	Contaminated Land	High	High
			Flooding of residential properties	Displaced people	Emergency Planning, Adult Care	High	Very High
				Contamination of residences and need for increased waste collection after event	Emergency Planning	Medium	High
			Pluvial flooding (flash floods from rainfall)	Industrial technical failure e.g. substation / sewerage pumping station	Emergency Planning	Medium	High
				Structural damage to roads and flood defences e.g. Erosion / landslides	Emergency Planning, Highways Division, Public Transport	Medium	High
				Potential flooding and erosion of agricultural land leading to loss of livelihood and sustainability	Land Drainage	Medium	High
			Flooding of roads and other transport networks	Limited access for emergency vehicles	Emergency Planning, Highways Division	High	Very High
				Erosion/destruction of river banks / flood defences	Emergency Planning	Medium	High
				Agricultural losses affecting food supply	Emergency Planning	Medium	High
				Traffic Strandings	Emergency Planning, Highways Division	High	Very High
			Damage to structures such as bridges, culverts, road signs and street lighting as well as damage to road and pavement surfaces	Decreased road safety for fleet vehicles	Highways Division, Emergency Planning	High	High
			Patches of standing water on roads	Increased RTCs as a result of drivers aqua Planning or swerving to avoid standing water	Highways Division, Emergency Planning	High	High
			Lack of capacity in the storm/sewer and highway drainage system due to lack of maintenance and cleaning of inadequate size causing roads to flood	Severely flooded roads may need to be closed	Highways Division, Public Transport, Emergency Planning	High	High
			Infection from flooded workplaces / homes/	Workplace / homes unsuitable for occupancy until thorough clean-up has taken place (closure of Council	All Departments, particularly Corporate Property and possibly disruptions to service	Medium	Very High

			schools	buildings)	users			
			Damp or waterlogged soils causing land movements / affecting building foundations	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High	
			Insufficient time to complete repair work due to prolonged damp or wet periods	Repair works are delayed or cannot be completed	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High	
	Combined climatic effects	Storms / High winds	Inefficient building materials and fixing methods leading to structural damage (increasing wind loadings due to the effect of wind pressure or suction), e.g. damage to roofs, chimneys and external envelope	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property, and possibly disruptions to service users	Medium	Very High	
					Cause injury (Injury rates dependent on time of day storm occurs morning and evening commuting time highest no of injuries and deaths)	Risks to Council staff and public	High	High
					Cause death (Death rates dependent on time of day storm occurs morning and evening commuting time highest no of injuries and deaths)	Risks to Council staff and public	High	Very High
				Increasing damage to trees with potential for damage to property	Cause injury due to falling trees and/or damage to property	Risks to Council staff and public	High	Very High
				Falling trees	Events postponed or called off	All Departments, particularly Countryside Service, Cultural and Community Services, Adult Care	High	High
				Trees blown onto transport networks / infrastructure	Disruption to food supplies	Emergency Planning	Medium	High
					Disruption to transport network e.g. Bridges/railways/roads	Emergency Planning, Highways Division, Public Transport	Medium	High
				Scour and damage to transport infra structure such as roads and bridges	Decreased road safety for fleet vehicles	Highways Division	High	High
				Disruption to waste disposal	Articulated vehicles transporting waste will be at risk	Waste Management	High	High

				to high winds, this may prevent them being used.				
			Power disruption	Servers going down & computer systems failing - failure to respond effectively to a major business interruption and social workers unable to access files	All Departments, particularly CAYA and Adult Care	Medium	High	
				Loss of telecommunications and electricity supply	All Departments and risks to public	Medium	High	
		Lightning	Structural damage	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High	
			Damage to electrical equipment and electrical circuits	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High	
			Fire	Closure or partial closure of Council buildings to allow remedial repairs	All Departments, particularly Corporate Property and possibly disruptions to service users	Medium	Very High	
			Falling trees	Events postponed or called off	All Departments, particularly Countryside Service, Cultural and Community Services, Adult Care	High	High	
			Lightning strike	Loss of telecommunications	All Departments, particularly Emergency Planning	Medium	High	
			Fog / Mist / Low cloud	Barriers to sun penetration	Stop land areas from drying out (land needs less additional precipitation to exacerbate the problem)		Medium	High
			Driving rain (rainfall, wind speed, direction)	Weathering on buildings (e.g. performance of sealing products and materials)	Increased inspection and maintenance leading to increasing costs	Corporate Property	Medium	High
		Increased water ingress to buildings		Increased inspection and maintenance leading to increasing costs	Corporate Property	Medium	High	

Appendix 2 – IPCC graph indicating future global warming based on various carbon emissions scenarios <http://ipcc.ch/>

