



Leicester  
City Council

**WARDS AFFECTED: All**

**Overview and Scrutiny Management Board  
Cabinet**

**8<sup>th</sup> May 2008  
2<sup>nd</sup> June 2008**

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**LEICESTER CITY COUNCIL CLIMATE CHANGE ADAPTATION ACTION PLAN  
REPORT**

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**Report of the Corporate Director of Regeneration and Cultural Services**

**1 Purpose of Report**

1.1 This report describes the progress toward developing Part 2 of Leicester City Council's Climate Change Action Plan focused on adaptation. Climate change adaptation is the anticipation of, and preparation for, key impacts of climate change across the complete range of LCC services and estate. The plan will contribute towards the citywide adaptation plan, which is to be developed for Local Area Agreement Indicator 188. This is a local indicator for the Leicester Partnership.

**2 Summary**

2.1 Leicester's Sustainable Community Strategy, One Leicester, is a 25-year vision to make Leicester into Britain's sustainable city. The 6 priorities for action focus upon improving the quality of life for all residents, enhancing the prosperity of the city and develop Leicester into a vibrant, safe, clean and green city with world-class public services well adapted for the future. This action plan will help deliver those objectives by preparing LCC services, assets and infrastructure to adapt to future climate change.

2.2 The proposed action plan is for Leicester City Council services only. However, the proposed methodology and actions will inform the city wide Adaptation Action Plan for the Leicester Partnership, which is to be developed later in 2008 under the Local Area Agreement Indicator 188.

2.3 Leicester City Council has demonstrated a strong commitment to the environment, improving energy efficiency, CO<sub>2</sub> reduction and tackling global climate change at a local level for many years. Leicester's Climate Change Strategy was published in 2003, which set a 50% CO<sub>2</sub> reduction target from 1990 levels by 2025. The Council signed the Nottingham Declaration on 2nd November 2006. This committed the organisation to set a greenhouse gas emission reduction target to cut emissions from its' own operations and develop plans with partners and local communities to progressively address the causes and effects of climate change. The Council Adopted Part 1 of the LCC Climate Change Action Plan focused on Mitigation in March 2007.

2.4 The methodology used to develop the LCC adaptation action plan is a combination of the Leicester City Council Corporate Risk methodology, EMAS and best-practice guidance from UK Climate Impacts Programme (UKCIP). Widespread consultation with key officers from a range of service areas identified a diverse range and number

of Council services impacted by climate change. It is proposed that EMAS will be used to manage the negative aspects of the significant effects identified by the risk assessment. There are also some potential benefits or opportunities from future climatic change also described.

- 2.5 The consultation process to highlight potential risks to Council services from future climatic change identified 5 issues that scored 18 on the combined risk assessment. These included flash flooding of the road network, increasing temperatures in the urban area, 'climate proofing' future development of the built environment and subsidence risk to both LCC and private buildings and infrastructure (Appendix 2C).
- 2.6 These issues affecting LCC were grouped together under three significant effects. These new effects will be added to the EMAS significant effects register and managed within the EMAS system. The significant effects are listed below.

**Leicester City Council's role in managing the negative impacts to its services, assets and infrastructure from;**

- 1. Flood Risk**
- 2. Summer Heatwaves and Prolonged Periods of Increased Average Temperatures**
- 3. Water Availability**

Key objectives have then been set to tackle each of the significant effects. Each objective is divided into a series of service level actions or responses that have been identified from officer recommendations, case studies and best practice guidance. These are listed in the Adaptation Action Plan (Appendix 4).

### **3. Recommendations**

Members are recommended to:

1. Adopt the Leicester City Council Climate Change Adaptation Action Plan
2. Agree to commit the staff resources to the implementation of actions and annual reporting of progress as detailed in the Adaptation Action Plan
3. Develop a city wide Adaptation Action Plan through the Leicester Partnership
4. Note the next steps to be taken

### **4 Report Background**

- 4.1 Leicester City Council has demonstrated leadership and strong commitment to the environment, improving energy efficiency and CO<sub>2</sub> reduction at a local level over many years.

- 1990, Leicester being named the first 'Environment City'.
- 1994, Energy Action Plan. This set a target to reduce energy consumption by 50% from 1990 levels by 2025.
- LCC joined the International Council for Local Environmental Initiatives (ICLEI's) Cities for Climate Change Protection Campaign in the late 1990's.
- 1999, Eco-Management and Audit Scheme (EMAS) introduced to manage environmental performance.

- 2003 LCC and the Leicester Partnership adopted the city wide Climate Change Strategy for Leicester which set a 50% CO2 reduction target from 1990 levels by 2025.
- 2006, LCC signed the Nottingham Declaration.
- 2007, LCC adopted Part 1 of the LCC Climate Change Action Plan focused on mitigating emissions from the Council's own operational activities.
- 2007, LCC and Leicester Partnership Executive approved a report in to create a Climate Change Board. The Board will take responsibility for delivering citywide climate change targets and other climate change commitments under the Nottingham declaration and LAA/MAA process.
- 2008, Sustainable Community Strategy. 25 year vision to make Leicester Britain's sustainable city.

### **Summary of climate change impacts**

4.2 There is a general scientific consensus that anthropogenic greenhouse gas emissions have significantly contributed to rapid and potentially irreversible climate change. "It is now unequivocal that climate change is underway and that the consequences are likely to be severe" (Inter-governmental Panel on Climate Change, 2007). Due to the inertia of the climatic system, even if we were able to prevent any further greenhouse gas emissions (GHG) from this day, the greenhouse gases already in the atmosphere will result in a degree of change within our climate. There is a need not only to mitigate further emissions, but to adapt our assets, infrastructure and services to best cope with these inevitable changes.

4.3 The UK Climate Impact Programme (UKCIP) has developed future climate change scenarios, using a climate change model, to predict average temperatures, rainfall patterns and intensities, soil moisture content and storminess up to 2080 for a range of GHG emission scenarios. (Appendix 1) These highlight the significant changes in climate we will experience over the coming decades including:

- Hotter, drier summers
- Milder, wetter winters
- Changes to seasonality
- More frequent periods of extreme high temperatures
- More frequent localised storm events with more intense rainfall
- A significant reduction in summer soil moisture content
- Possible higher wind speeds

### **What is Adaptation?**

4.4 Adaptation is an adjustment in natural and human systems in response to actual or expected climate changes to limit the impacts and effects or take advantage of any beneficial opportunities. It involves a mixture of response strategies that include building climatic resilience into our assets and infrastructure through design, planning process and maintenance programmes and through contingency planning to increased preparedness to cope with extreme events and manage individual's expectations.

### **Why Adaptation is important?**

4.5 Cities are vulnerable to climatic changes as they concentrate people and buildings into a relatively small area and are dependent upon systems of transportation to move people and goods, communications infrastructure, water and energy distribution networks and sewers and waste removal systems. This concentration of people,

wealth and the dependence on such infrastructure make urban centres at risk from weather extremes.

- 4.6 The Stern Review, published in 2006, clearly states that climate change is now a mainstream economic and social issue, not simply an 'environmental problem'. The review highlighted the risks to the economy and economic growth from future climatic change and that strong early action now will prevent much greater costs in the future.

#### **Adaptation Action Plan Methodology**

- 4.7 The methodology used to develop this adaptation action plan follows a risk management approach and has drawn on the best-practice guidance from UK Climate Impacts Programme (UKCIP) and their risk based climate adaptation decision-making framework. This process follows several stages as follows:

- Establish the reasons for developing an Adaptation Strategy and Action Plan and who is to be involved in it's development
- Carry out a scoping study to identify and evaluate risks and opportunities
- The development of an Action Plan to adapt to these risks and to inform and link to existing action plans and strategies. One example would be the Transport Asset Management Plan.
- The implementation of the action plan and regular reporting of progress

- 4.8 An Adaptation Action Plan for Leicester City Council is of great importance as it will help us adapt our services and infrastructure, increase our level of preparedness and reduce future economic costs in the face of a changing climate. A series of presentations were held with Heads of Service and Team Leaders to introduce adaptation and name key officers to inform the risk assessment (see Appendix 6).

- 4.9 Climate change risks and opportunities were then identified from widespread consultation with key officers from a range of service areas within the organisation and case studies and best practice guidance from existing literature. These risks were drawn together in an Adaptation Risk Register and each individual risk was rated to prioritise its significance. Leicester City Council's corporate risk matrix was used to determine the impact and probability giving a score between 1-9, 1 being of low risk and 9 being of greatest risk.

- 4.10 In order for the Adaptation Action Plan to be managed within the EMAS system, the degree of influence or control the Council has over each risk had to be included. Each risk was also assessed, using the EMAS scoring criteria, as to the Council's control over the outcome and scored between 1 and 3, 1 being little or no influence, 2 having a degree of control and 3 being completely within the Council's control. The two scores were then multiplied together to give an overall score. This Risk Register is shown in Appendix 2 A. The opportunities from future climate change are shown in the Opportunities Register (Appendix 2 B).

- 4.11 The consultation process and literature review highlighted 5 potential issues or risks, to Council services, assets and activities from future climatic change that scored 18 on the combined risk assessment. These were flash flooding of the road network, summer heatwaves and prolonged periods of increased temperature, 'climate proofing' future development of the built environment and subsidence risk LCC and private to buildings and infrastructure and are the issues most urgently in need of being addressed (See Appendix 2C).

4.12 To reduce the impact of these risks, three significant effects were developed. The significant effects are: Leicester City Council's role in managing the negative impacts to its services, assets and infrastructure from;

**1. Flood Risk**

**2. Summer Heatwaves and Prolonged Periods of Increased Average Temperatures**

**3. Reduced Summer Water Availability**

These 3 effects will be added to the EMAS significant effects register and managed within the EMAS system. For each effect, a series of objectives were then outlined to tackle these effects (Appendix 3).

**Proposed Actions**

4.13 The Adaptation Action Plan detailing service level actions or responses to meet the objectives was then developed. Each action was ranked according to expected implementation cost and resource requirement and a key officer or service area responsible for the delivery of that action identified (Appendix 4). The actions listed have taken account of existing LCC policies, programmes and reports. An example being the Local Environmental Works Programme to improve open and green space, which will be presented to Cabinet during summer 08, will reflect the findings of this report. The use of porous paving materials for verge hardening to reduce flood risk will be considered.

4.14 These actions ranged from no regret options which will deliver economic benefits regardless of the degree of climate change, through low regret options which will deliver economic benefits in the future as climate change develops, to win-win measures, which provide both mitigating and adaptive benefits but likely to have a higher implementation costs (See Appendix 5 for a more detailed explanation). The action plan also sets a timescale for the review of progress of each action along with recommendations to progress the objectives.

4.15 The most immediate risks to be addressed relate to the risks of flash flooding, the Urban Heat Island effect, managing water resources and ensuring that future development of the built environment considers the predicted climate change at the design stage. Whilst these effects and objectives do not cover all the issues that will impact upon Council services that relate to climate change, they are the most important risks at this time. As climate change develops, average temperatures rise and extreme events intensify, other issues may increase in importance and so the risk assessment will need to be revisited on a regular basis and the significant effects and objectives reviewed. The Environment Team will monitor and review the LCC Adaptation Action Plan annually.

4.16 Following the implementation of the LCC Adaptation Action Plan the methodology used will be adopted to develop a city-wide Adaptation Action Plan through the Leicester Partnership to better prepare the city for future climate change supporting the One Leicester's 25 year vision

**The Aims of the Adaptation Action Plan**

4.17 The Adaptation Action Plan seeks to reduce the risks associated with climate change on council services. However, target setting for risk reduction is difficult to establish at the outset, as this will be an iterative process. The extent of future climate change is

uncertain at this stage. Expert advice from UKCIP (Climate Impact Programme) recommends an incremental approach to adaptation rather than whole scale action at this stage.

The Action Plan will:

1. Ensure that contingency planning is in place to manage extreme climatic events
2. Ensure that the economy is prepared for the challenges and opportunities presented by climate change
3. Ensure that new development is located, designed and constructed for the climate change it will experience over its design life
4. Raise awareness and understanding of climate change and positively influence behaviour
5. Enable the adaptation of existing development
6. Reduce social inequality and improve public health
7. Develop the natural environment to help deliver adaptation objectives

### **Next Steps**

4.18 The next steps are as follows:

1. The proposed action programme will be implemented from May 2008.
2. Introduce and roll out the plan to service areas
3. Establish (cross service) working groups to assist with delivering required actions
4. Implement no cost options followed by low cost and win-win measures
5. Review progress and update action plan with new innovations, best practice guidance and officer recommendation
6. Annual reporting to Cabinet - Members will receive the next annual report on progress towards the targets in May 2009.
7. In addition to the internal actions listed above, a city-wide action plan, led by the Leicester Strategic Partnership, will be developed to identify a city-wide adaptation action plan

## **5. FINANCIAL, LEGAL AND OTHER IMPLICATIONS**

### **5.1. Financial Implications**

The actions listed in the Adaptation Action Plan related to reducing the risk of flooding across the highway network (1.1.1 - 1.1.10) will be supported from the growth bid of £50,000, rising to £150,000 in future years, to improve the cities flood defences. These actions are reflected in the Flood Risk Strategy that is currently under development. Those actions described which relate to Property and Planning Policy and Design, will be met from existing staff resources as agreed by the key officers and service areas listed. The Adaptation Plan will be supported by officers across the council and the Environment Team will assist in the co-ordination, delivery, monitoring and review of the actions listed.

*Martin Judson, Head of Finance, Ext. 29 7390*

### **5.2 Legal Implications**

Existing powers permit the actions listed in the attached Adaptation Action Plan. The Plan includes the procurement of goods and services, which will need to take place in accordance with EU Procurement Rules (when contract value thresholds are exceeded) and the Council's CPRs.

*Greg Surtees, Senior Solicitor, Ext. 29 6453*

## **6. Other Implications**

<b>OTHER IMPLICATIONS</b>	<b>Yes/No</b>	<b>REFERENCES WITHIN THE REPORT</b>
Equal Opportunities	Yes	Climate change will have greatest impact upon vulnerable and disadvantaged groups including those on low incomes, those suffering with poor health, those in poor quality accommodation and the elderly and very young.
Policy	Yes	Nottingham Declaration, Leicester Climate Change Strategy, EMAS is the Management system used to implement the corporate environmental policy.
Sustainable and Environmental	Yes	EMAS is the Management system used to implement the corporate environmental policy.
Crime and Disorder	No	
Human Rights Act	No	
Older People on Low Income	Yes	Climate change will have greatest impact upon vulnerable and disadvantaged groups including those on low incomes, those suffering with poor health, those in poor quality accommodation and the elderly.

## 7. Risk Assessment Matrix

<b>Risk</b>	<b>Probability L/M/H</b>	<b>Impact L/M/H</b>	<b>Control Actions (if necessary/or appropriate)</b>
1 – Major disruption to the road network due to localised ‘flash flood’ events.	M	H	
2 – Urban Heat Island effect in city centre area	M	H	
3 – Design of future developments within the built environment	M	H	
4 – Subsidence risk to buildings and infrastructure	M	H	
5 – Insufficient resources, including financial, knowledge and expertise and staff time, to deliver objectives	H	H	
6 – Lack of co-operation from partners outside of the organisation	M	H	

L - Low  
M - Medium  
H - High

L - Low  
M-Medium  
H - High

## 8. Background Papers –

- Leicester Partnership Climate Change Strategy 2003
- Report to Cabinet - Leicester City Council’s Climate Change Mitigation Action Plan part 1 12<sup>th</sup> March 2007
- Nottingham Declaration on Climate Change (signed by LCC 2/11/06)
- Report to Cabinet - Eco-Management and Audit Scheme (EMAS) Review of 2006/07
- Report to Cabinet - Climate Change – The Next Steps
- Transport Asset Management Plan
- Planting 10,000 Trees

## 9. Consultations

**Consultees**

Individual officers named in the action programme (Appendix 6)  
Climate Change Shadow Board

**Date Consulted**

Oct- Dec 2007

February 2008

**10. Report Author**

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**Appendices**

- Appendix 1 - UKCIP 02 Climate Change Scenarios': East Midlands
- Appendix 2 A - Adaptation Risk Register
- Appendix 2 B - List of Potential Opportunities
- Appendix 2 C - Justification of the significant effects and Objectives
- Appendix 3 - Corporate Significant Effects and Objectives
- Appendix 4 - Adaptation Action Plan
- Appendix 5 - Description of Adaptation Options
- Appendix 6 - List of Consultees

<b>Key Decision</b>	Yes
<b>Reason</b>	Is significant in terms of its effect on communities living or working in an area comprising more than one ward
<b>Appeared in Forward Plan</b>	Yes
<b>Executive or Council Decision</b>	Executive (Cabinet)



## Appendix 1: UKCIP 02 Climate Change Scenario's: East Midlands

Changes in climate hazards	Relative confidence level	Low emissions scenario	High emissions scenario
Increasing summer temperatures	High	2020s: 0.5 to 1.5°C 2050s: 1.5 to 2.0 °C 2080s: 2.0 to 3.0 °C	2020s: 1.0 to 1.5°C 2050s: 2.5 to 3.5 °C 2080s: > 4.5°C
Increasing winter temperatures	High	2020s: 0.5 to 1°C 2050s: 1 to 1.5°C 2080s: 1.5 to 2°C	2020s: 0.5 to 1°C 2050s: 1.5 to 2°C 2080s: 3 to 3.5°C
More frequent extreme high temperatures The urban heat island effect currently adds up to a further 5 to 6°C to summer night temperatures and is expected to intensify in the future	High	Increase of up to 14 'extremely' <sup>(a)</sup> warm days in summer by the 2080s <sup>(b)</sup>	Increase of up to 30 'extremely' <sup>(a)</sup> warm days in summer by the 2080s <sup>(b)</sup> Daily maximum temperatures of 33°C, which currently occur about 1% of summer days. By 2080s could occur up to 20% of summer days <sup>(b)(c)</sup>
Less extreme low temperatures	High	Fewer frosts, long runs of snow less winters Snow fall 60-90% decrease	
Increasing winter rainfall	High	2020s: 0 to 10% 2050s: 10 to 15% 2080s: 10 to 20%	2020s: 0 to 10% 2050s: 15 to 20% 2080s: 25 to 30%
Reducing summer rainfall	Medium	2020s: 10 to 20% 2050s: 10 to 30% 2080s: 20 to 30%	2020s: 20 to 30% 2050s: 20 to 40% 2080s: 40 to 50+%
Increases in winter precipitation intensity	High	By the 2080s, 10 to 20% increase in the daily precipitation amount which can be expected, on average, once every 2 years <sup>(b)</sup>	By the 2080s, 20%+ increase in the daily precipitation amount which can be expected, on average, once every 2 years <sup>(b)</sup> Heavy winter rainfall could occur twice as often by the 2080s <sup>(b)(c)</sup>
Potentially an increase in frequency of winter storms	Low	Increase in the number of winter deep depressions crossing the UK from 5 (1961-90) to 8 by the 2080s Mean winter wind speeds could increase by as much as 10% by the 2080s <sup>(b)</sup>	
Reduction in soil moisture content	High for summer changes	In summer, reduction of 20-30% by the 2080s <sup>(b)</sup>	In summer, reduction of 30% to 50% by the 2080s <sup>(b)</sup>
<p>(a) 'Extremely' warm days are defined using the 90<sup>th</sup> percentile daily average temperature modelled for the baseline period 1961-1990, i.e. the daily average temperature which is exceeded, on average, on 10% of days</p> <p>(b) Data only available for the 2080s in the UKCIP02 Climate Change Scenarios</p>			
Data taken from 'The potential impacts of climate change in the East Midlands' 2004			