



Report to Economic & Environmental Wellbeing Scrutiny & Policy Development Committee 21st March 2013

Report of: Andy Nolan, Director of Sustainable Development

Subject: Sheffield Climate Change Adaptation Strategy –
managing risks and increasing resilience

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Summary:

Our climate is changing globally with impacts experienced locally. Without global and local action to reduce our greenhouse gas emissions, we run the risk of significant changes to our climate that will dramatically impact on our quality of life and the economy.

Even if we reduce our greenhouse gas emissions significantly from now on, we will continue experiencing extreme weather events and a changing climate for decades to come (because of historic greenhouse gas emissions in the atmosphere). We therefore have to become more resilient and keep adapting to extreme weather events we are experiencing locally today.

As an estate manager, service provider and community leader, Sheffield City Council plays a vital part in ensuring that climate change adaptation is taking place at a local level.

Type of item:

Reviewing of existing policy	
Informing the development of new policy	X
Statutory consultation	
Performance / budget monitoring report	
Cabinet request for scrutiny	
Full Council request for scrutiny	
Community Assembly request for scrutiny	
Call-in of Cabinet decision	
Briefing paper for the Scrutiny Committee	X
Other	

The Scrutiny Committee is being asked to:

The Committee is asked to consider the approach taken and provide views, comments and recommendations to the following questions:

- How do we further improve the culture within SCC?
 - How do we make the business case for adaptation & resilience?
 - How do we engage & raise awareness with the public?
 - How can the Scrutiny Development Board be actively involved in shaping this strategy?
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Background Papers:

- UK Climate Change Risk Assessment: Government Report (2012):
<http://www.defra.gov.uk/publications/files/pb13698-climate-risk-assessment.pdf>
- Summary of the key findings from the CCRA analysis (2012):

Summary_of_Key_Findings (3).pd...
- Climate Ready – Local Government (Environment Agency)
<http://www.environment-agency.gov.uk/research/policy/132335.aspx>
- 'Resilient Sheffield' Arup methodology and report (2011):

Resilient Sheffield Report SCC...
- Sheffield's 'Local Climate Impacts Profile' (2009):
<https://www.sheffield.gov.uk/environment/climate-change/local-climate-impact-profile.html>
- Yorkshire and Humber regional adaptation study (2009):
<http://www.yourclimate.org/pages/regional-adaptation-study>
- The impact of climate change on health and health inequalities in the north west of England (2012):
<http://www.cph.org.uk/showPublication.aspx?pubid=775>
- Urban adaptation to climate change in Europe (European Environment Agency 2012)
<http://www.eea.europa.eu/publications/urban-adaptation-to-climate-change>

- Socially just adaptation to climate change (Joseph Rowntree Foundation 2012)
<http://www.jrf.org.uk/publications/socially-just-adaptation-climate-change>
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Category of Report: OPEN

Sheffield Climate Change Adaptation Strategy – managing risks and increasing resilience.

1. Introduction

- 1.1 Our climate is changing globally with impacts experienced locally. Without global and local action to reduce our greenhouse gas emissions, we run the risk of significant changes to our climate that will dramatically impact on our quality of life and the economy.

Even if we reduce our greenhouse gas emissions significantly from now on, we will continue experiencing extreme weather events and a changing climate for decades to come (because of historic greenhouse gas emissions in the atmosphere). We therefore have to become more resilient and keep adapting to extreme weather events we are experiencing locally today – in order to maintain critical infrastructure and service delivery.

As an estate manager, service provider and community leader, Sheffield City Council plays a vital part in ensuring that climate change adaptation is taking place at a local level.

In this document, ‘adaptation’ is used to define actions to -

- understand the risk and opportunities we face from extreme weather today and further changes to our climate in the future;
- identify, assess and prioritise the options to manage the risks and opportunities;
- develop, deliver and monitor actions to manage these risks and realise these opportunities.

- 1.2 Why adapt?

In the UK, we expect a shift towards generally wetter winters, and a greater risk of heavy rainfall (or snow) events. The UK Climate Projections published in 2009 (UKCP09) suggest that there is a greater likelihood that summers will be drier but future patterns of rainfall are less certain than changes in temperature.

Adaptation must be built into local planning and management to increase the resilience of vital services and infrastructure, ensuring that local communities and businesses are not disrupted severely during severe weather events.

"More of this extreme weather will exacerbate many of the problems that we already deal with including flooding and water scarcity, so taking action today to prepare and adapt homes, businesses, agricultural practices and infrastructure is vital."

Chris Smith, Chairman of the Environment Agency (March 2013)

The economic and social benefits of early adaptation are significant in reducing the cost of climate change impacts over the long term.

Climate change will create opportunities as well as risks for local authorities, local communities and the economy.

2. Why adapt & how to structure the approach for Sheffield?

2.1 Why adapt - objective and approach of adaptation:

The objective of adapting to climate change is to sustain and even improve our quality of life. Because the climate will keep changing over time, our responses will have to change with it. Therefore adaptation responses have to evolve and be reviewed regularly. Adaptation should be seen as a 'journey', rather than a 'destination'.

2.2 Legislative Framework

The current Climate Change Act 2008, introduced by the previous government, makes the UK the first country in the world to have a legally-binding long-term framework to cut greenhouse gas emissions and a framework for building the UK's ability to adapt to a changing climate.

The first UK Climate Change Risk Assessment (CCRA) was published in January 2012. [A copy has been provided to the Scrutiny Board with this paper] The CCRA will be followed by the first National Adaptation Programme (NAP) (summer 2013), setting out Government proposals and policies for responding to the most pressing climate change risks identified in the CCRA.

From 1 October 2011, the Environment Agency took on a new role as the Government's delivery body for climate change adaptation in England. The new 'Climate Ready' programme will complement the Environment Agency's existing roles and responsibilities and is being developed closely with the Government's National Adaptation Programme for the UK.

2.3 UK Government's rationale

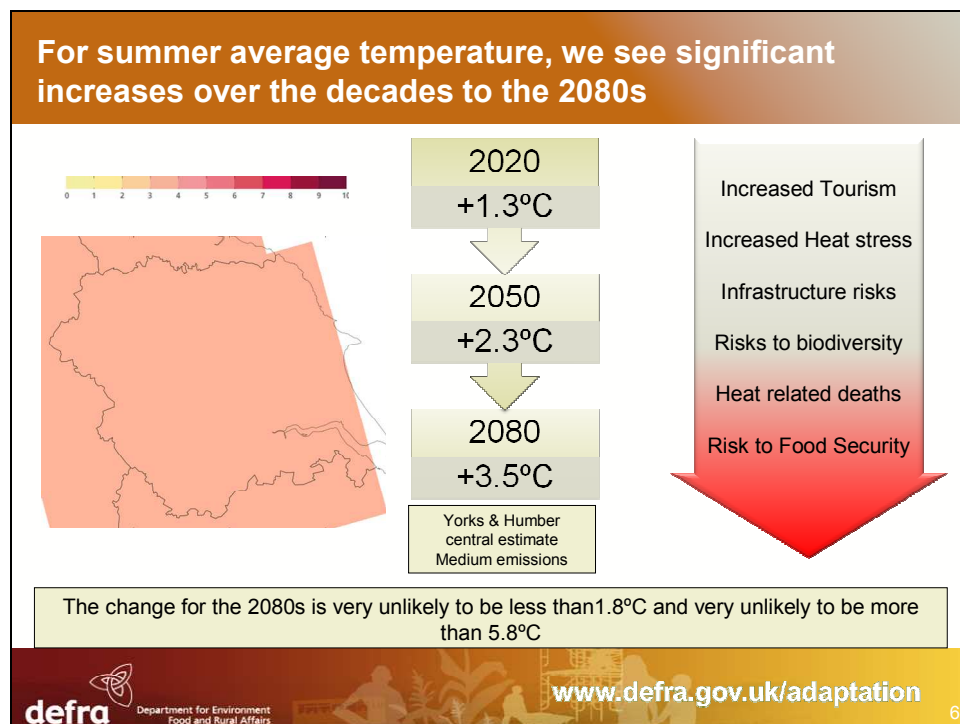
The UK is at the forefront globally of climate science. Whilst the future is highly uncertain, we know that the world's climate and weather is continually changing, resulting in both long and short-term variability – and that these natural variations often have significant effects on our lives.

Global temperatures are projected to continue rising, which is very likely to cause continued changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather events.

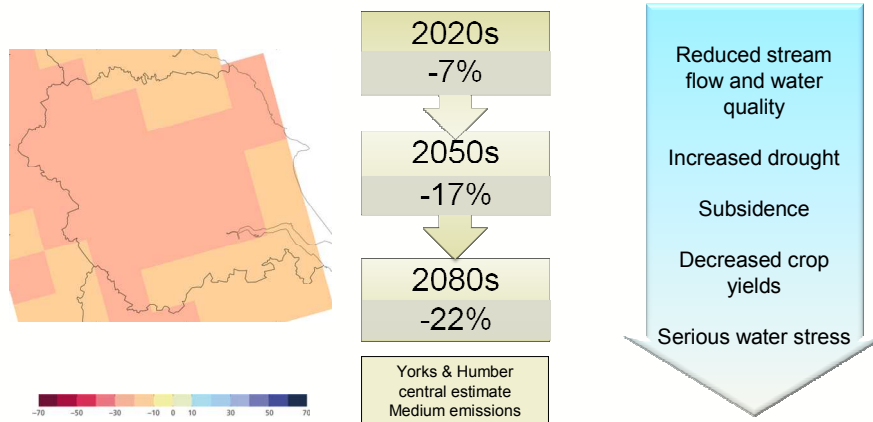
2.4 Climate change projections for the UK & Yorkshire & Humber

The UK currently has the most advanced climate projections in the world. The UK Climate Impact Programme (UKCIP) and the Met Office have produced the UK Climate Projections (UKCP09). They project that the UK will experience warmer, wetter winters and hotter, drier summers in the future. Extreme weather, such as heatwaves and very heavy rainfall will become more frequent and intense. Very cold winters will still occur, though they will become less frequent. Sea levels are expected to continue to rise for centuries to come.

Climate Change Projections for Yorkshire & Humber (DEFRA)

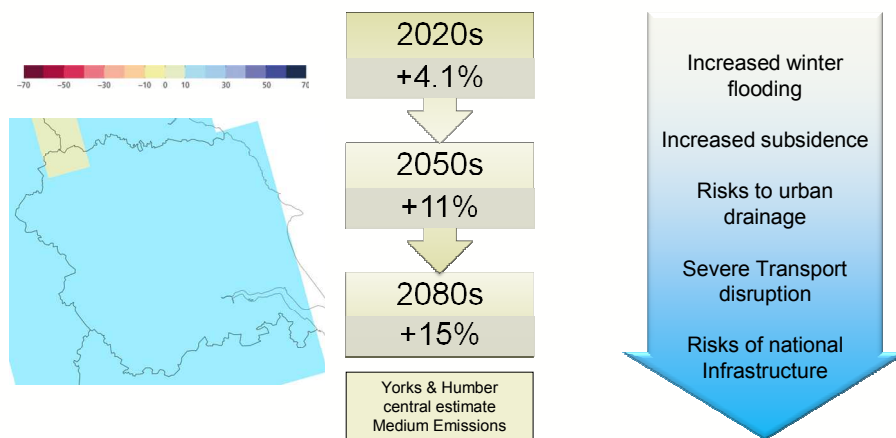


For rainfall we could see significant summer decreases



For the 2080s the change is very unlikely to be lower than -43% and very unlikely to be higher than +1%

For rainfall we see significant winter increases



For the 2080s the change is very unlikely to be lower than +2% and very unlikely to be higher than +33%

2.5 Risks and opportunities – need for early action

Although considerable uncertainty remains about the specific impact of future climate change risks, there is sufficient evidence to start planning adaptation actions. Overall, the UK Government's CCRA has produced preliminary findings indicating that the greatest need for action within the next five years is needed in the following areas:

2.5.1 Risks:

- **Overheating of buildings** (impact on people) **and other infrastructure** in the urban environment;
- **Risks to health** (e.g. from heatwaves and flooding) and impacts on NHS, public health and social care services;
- **Flood risk management** (and coastal erosion);
- Management of **water resources** (particularly in areas with increasing water scarcity);
- Aspects of **natural ecosystems** (e.g. managing soils, water and biodiversity);

2.5.2 Opportunities:

- **Health**: fewer winter / cold weather related premature deaths;
- **Economic opportunities**, especially to develop adaptation products and services (advanced manufacturing) and opportunities in the leisure and tourism industry.

2.6 Sheffield City Council's role & approach

As an estate manager, service provider and community leader, Sheffield City Council plays a vital part in ensuring that climate change adaptation is taking place at a local level.

The Corporate Plan 2011-14 "Standing Up for Sheffield" made a clear commitment for Sheffield to be "an Environmentally Responsible City".

Besides the commitment to reduce carbon emissions and to improve energy security and affordability for homes and businesses in the city, the Council also aims to make the city more resilient to future climate change. This is about making sure that infrastructure and services of the city are able to cope with the impacts of climate change in the future.

The Council's role and approach will be more explicitly set out in the Adaptation Strategy that is currently being developed. The Scrutiny

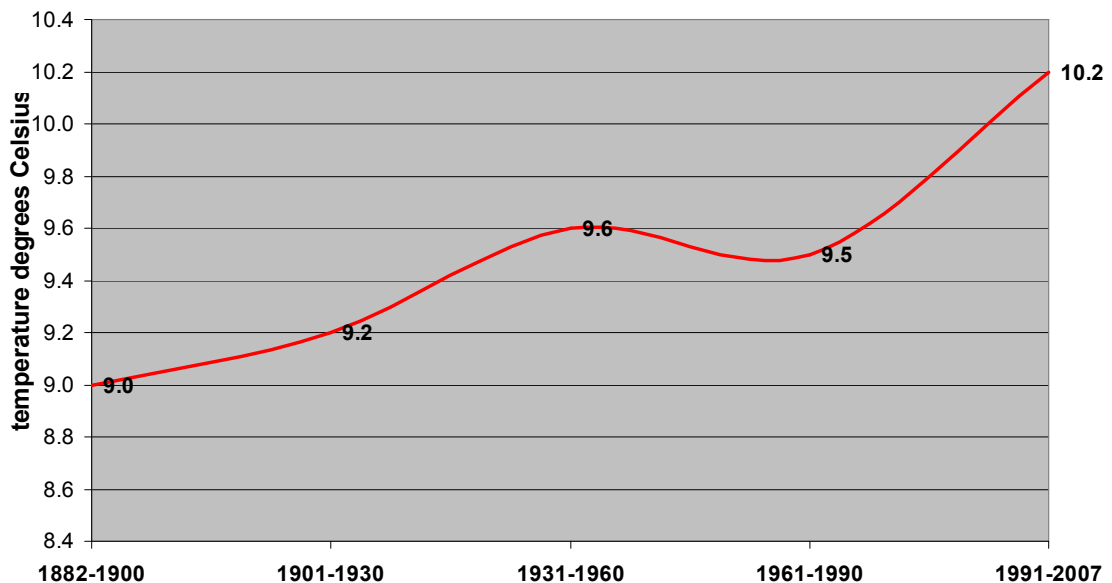
Board is invited to comment further on the appropriate role and approach for Sheffield City Council.

2.7 Evidence from the Sheffield 'Local Climate Impacts Profile' study (2009)

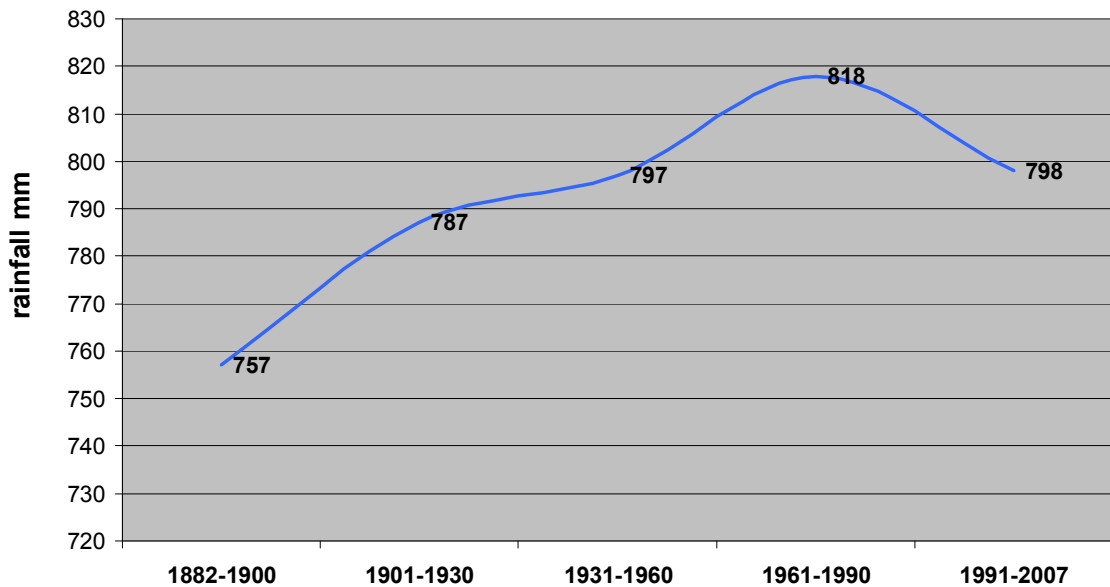
Overall the data revealed that Sheffield's climate is changing now faster than it has at any time in the last 125 years. The study highlighted a number of trends:

- Average annual temperatures are increasing, with almost half the increase occurring since 1990;
- The warmest years (1990 & 2006), the warmest month (July 2006) and the highest temperature (34°C/94°F) recorded have all occurred since 1990;
- A general trend of increasing rainfall but a reduction over the last 20 years.

Mean annual temperature (30 year averages) Weston Park:



Mean annual rainfall (30 year averages) Weston Park:



Sheffield's Extreme Weather Timeline (1998-2008) shows that there have been:

- major flooding events (including the 2 major episodes in June 2007) causing loss of life, destroying homes and businesses, damaging public transport infrastructure, delaying services and causing major traffic disruption;
- 2 heat waves in 2003 and 2006 (although known to cause excess deaths, no data is available for Sheffield);
- 9 episodes of strong winds and 4 lightning storms causing damage to housing and schools and disrupting traffic and public transport;
- episodes of snow and ice causing disruption to public transport and traffic, schools closures and a surge in hospital A&E admission.

2.8 Economic Impact of the floods in 2007 in Sheffield

The overall costs to the city were an estimated £135 million, with an estimated:

- £9.9 million damages to highways infrastructure
- £225,000 damages to parks & countryside
- £2.1 million of claims for damages to council properties
- 21,000 of claims for damages to council vehicles

2.9 Findings from 'Resilient Sheffield' Risk Assessment project 2010

In 2010 SCC and Arup conducted a stakeholder engagement and workshop project. The aim was to look at existing and future climate change impacts for Sheffield by adopting a systems approach. This methodology aimed to highlight interdependencies and 'knock-on effects' of climate change impacts on different services. Key Council officers and external stakeholders took part in this climate change risk assessment process.

Key findings and areas of Sheffield's vulnerability to climate change ('Leading Systems'):

Table/ Focus Area	Leading System	Cluster
1	Transport	Business Flood Control Food Energy
2	Energy	Water Transport Housing ICT
3	Housing	Energy Water/ Sewerage/ Flood Control Transport
4	Water/ Sewerage/ Flood Control	Habitat and Biodiversity Health Services Housing Food

[More detailed information about the methodology and findings can be found in the 'Background Papers' section]

2.10 Key messages for Sheffield

- Sheffield is **already vulnerable** to extreme weather, in the form of floods, droughts, heatwaves and very cold weather. Without action, further climate change will **increase the risk** of severe impacts.
- Sheffield has **already experienced some changes** to its climate and we should expect more extreme weather, such as heatwaves and very heavy rainfall. These are expected to become more frequent. Very cold winters will still occur, though they should become less frequent.
- Preparing for extreme weather and further climate change is about **managing risks and increasing our resilience** – it is therefore as

much about the economy, quality of life and social equality, as about the environment.

- Early action today will not only manage current and future risks, but **save money and create jobs for people in Sheffield**, e.g. by making buildings and homes more energy efficient and encourage investment in 'low carbon' sector economy.
- Many of our vulnerabilities to climate impacts stem from Sheffield's 'urbanisation' and industrial past. Maintaining and **restoring greenspaces** and **building community capacity** will increase our resilience and improve our quality of life.
- Sheffield's topography and geography also contributes to our vulnerability. The **catchment of Sheffield's rivers** has steep upper reaches to the west and very flat lower reaches to the east, leading to rapid reaction to rainfall and resulting flood events.

2.11 Identifying key climate change risks and responsibilities for adaptation in Sheffield

No single authority or organisation can be entirely responsible, or capable, of increasing our resilience to climate risks. To effectively sustain and even increase Sheffield's resilience, we need to routinely consider climate change in all significant decisions the Council takes. A more joint-up working approach across the public, private and voluntary sectors is also necessary.

The strategy we are developing will set out the framework and actions to make this happen.

2.12 Strategy proposal & approach

This report sets out the ambition to develop a 'Climate Change Adaptation Strategy' for Sheffield City Council and the City. The Strategy will be crafted by

- Gathering a climate change evidence base
- Consolidating existing work and reports
- Mapping other Strategies and Plans affected by climate change (e.g. Flood Risk Management Strategy, Food Plan, GOSS etc.)
- Mapping climate risk & priorities
- Mapping responsibilities & partners
- Mapping response & action

2.12 Suggested key/priority climate risks and responses for Sheffield:

- Flooding
 - Spatial Planning
 - Flood Defence & Draining System
 - Flood water storage & redirection
- Drought
 - Water supply/resources
 - Water management
- Overheating
 - New design & retrofitting
 - Spatial Planning
 - NHS / Public Health

Additional areas of impact which will also be addressed:

- Health
- Environment
- Infrastructure
- Economy

As the council can't adapt Sheffield on its own and needs the support of other agencies, businesses, the Voluntary, Community & Faith sector and Sheffield's people.

Through a 'Climate Change Adaptation Strategy' the Council can provide a framework for collective action, identifying where the Council is uniquely placed to act and where other organisations (e.g. NHS, Environment Agency, Yorkshire Water etc.) can lead or facilitate action.

3 What does climate change and adaptation mean for people in Sheffield?

- Without adaptation local communities and businesses may experience severe disruptions during severe weather events, e.g.
 - Disrupted service delivery, including to vulnerable people
 - Disrupted energy supply
 - Disrupted food & water supply
- With a changing climate and more server weather events projected, people's health & wellbeing and quality of live will be affected
 - Affecting the most vulnerable groups in society

- Financial and economical implications
 - Accessing house/home or business insurance may become more difficult or very costly
 - Increased costs for replacement and repairs through damages

4 Recommendation

The Committee is asked to consider the proposal and provide views, comments and guidance to the following questions:

- How do we further improve the culture within SCC?
- How do we make the business case for adaptation & resilience?
- How do we engage & raise awareness with the public?
- How can the Scrutiny Development Board be actively involved in shaping this strategy?