



Climate Change Adaptation Action Plan

2011 - 2016

Wiltshire Council - Climate Change Adaptation Action Plan

September 2011

DRAFT

Contents

Executive Summary	4
1. Introduction	6
1.1 How this document is structured.....	6
1.2 Strategic context.....	6
1.3 Why we need to adapt to Climate Change	7
1.4 United Kingdom Climate Projections 2009 (UKCP09).....	10
1.5 Future Climate in the UK	11
1.6 Future Climate Change in Wiltshire.....	11
1.7 Definition of Climate Change Adaptation.....	12
1.8 The Different Types of Adaptive Actions	12
1.9 Key Drivers for Climate Change Adaptation	13
1.9.1 Climate Change Act 2008	13
1.9.2 National Indicator 188 (NI188)	14
1.9.3 Nottingham Declaration	15
1.9.4 Civil Contingencies Act (2004).....	16
1.9.5 Flood and Water Management Act (2010).....	16
1.9.6 Local Government Act 2000 – Well-being powers	16
1.9.7 Planning Policy Statements	16
1.10 Barriers to Adaptation.....	16
2.1 Introduction.....	18
2.2 Risk Assessment Methodology	18
2.2.1 Identifying areas of assessment.....	18
2.2.2 Emissions Scenario	19
2.2.3 Timescales.....	19
2.2.4 Weather and Climate Variables	19
2.2.5 Likelihood and Vulnerability	20
2.2.6 Assessing the risks with service managers.....	22
2.2.6 Peer Review within the council	25
2.3 Risk Categorisation and Reporting.....	25
2.3.1 Weather or Climate Specific Service Risks.....	25
2.3.2 Overall Service Area Risks	26
2.3.3 Weather or Climate Specific Department Wide Risks.....	26
2.4 Prioritising Risks and Opportunities for Wiltshire Council.....	26
3. Adaptation action plans.....	29
3.1 Risks and opportunities associated with each service.....	30
3.2 Themes used to structure action plans.....	32
3.3 Areas of cross cutting work	32
4. Implementation	34
4.1 Communications.....	34
4.2 Strategic Issues.....	34
4.3 Finance and Resources.....	36
4.4 Beyond the Adaptation Action Plan	37
5. Monitoring and continuous review.....	37

Executive Summary

Since Wiltshire Council was established in 2009 it has been committed to ensuring that services are properly prepared for the changing climatic conditions that are expected in the mid- to long-term in Wiltshire.

The council has followed a clearly defined process to establish an understanding of climate change in Wiltshire and to identify the actions necessary to adapt its services for the near term and for the future. The council's objective was to undertake a comprehensive risk-based assessment of current and future vulnerabilities to weather and climate and identify priority risks for its services.

The Adaptation Action Plan Process

In 2009, the council partnered with Climate South West, the SW Regional Improvement and Efficiency Partnership, and Student Force for Sustainability to employ a graduate student to carry out a **Local Climate Impacts Profile (LCLIP)** for Wiltshire. The LCLIP report, published in June 2009, used an established method of assessing the current vulnerabilities of the local authority as successfully implemented in around 100 other councils across the UK.

The six major **near-term** weather variables in Wiltshire identified by the LCLIP were: excessive rainfall & flooding; high wind speeds; snow, ice and freezing conditions; heatwaves and higher temperatures; droughts and water shortages.

The council also assessed the probability data of the United Kingdom Climate Projections 2009 (UKCP09), published in June 2009 by the Met Office Hadley Centre, to understand climate projections for Wiltshire for the mid and long terms. For the purposes of Wiltshire Council's risk assessment, the UKCP09 medium emissions scenario for the 2050's was selected as it provides a **mid range** estimate that is well within the life span of infrastructure projects that might be commissioned in the near future. The additional climate variables for the longer term are; hotter drier summers; and warmer wetter winters.

Using the probabilities from the UKCP09 data, the likelihood of weather variables was set and a risk assessment for every department was carried out for all services to identify the possible impacts against the weather variables, using a risk scoring matrix similar to the corporate risk assessment methodology.

The Adaptation Plan results

A total of 113 individual services from across all operational departments were involved in the risk assessment. This resulted in a total of 63 risks and opportunities being identified of which 29 were high risk. Adaptation measures were then identified for all the priority risks.

The majority of risks were identified against the Department of Transformation and Resources.

Key Implementation actions

An important element in the adaptation plan process has been to raise awareness and educate officers across the council about the effects of climate change in Wiltshire on their services. This awareness will be maintained through annual reporting on progress against the action plan.

The ECO Board will be responsible for ensuring that the identified actions are monitored and implemented on an annual basis. The adaptation plan risk assessment will be repeated every 5 years, in line with the national climate change risk assessment or when new climate change projections are released by the UK Climate Projections Programme.

In identifying council risks relating to our changing climate and obtaining nominated officers who will work to mitigate them, the ECO will undertake an annual assessment of how the council is preparing for Climate Change. Findings will be shared with the council's Risk and Assurance Team with appropriate action taken if progress is not as would be expected.

The majority of adaptation actions involve building adaptive capacity through embedding climate change into policies and plans and raising awareness. These will cost little and can be easily absorbed into existing business plans and budgets. Some actions, such as changing planting regimes to more climate-resilient species, modified maintenance regimes, or using existing communication techniques will also easily be absorbed into existing budgets.

Additional capacity-building costs such as training and information provision are likely to be small scale (under £20K). Medium-scale costs are likely to be incurred for projects involving changes to insurance premia, electricity and water use (e.g. for cooling and ventilation) and changes to Joint Venture contracts.

Large scale capital and revenue investment will be needed in the long term to ensure that buildings, infrastructure and services are resilient to climate change.

Beyond the Adaptation Plan

Wiltshire Council will work with other public sector bodies in Wiltshire to ensure that a joint approach is developed, and will also work with other neighbouring authorities to ensure the most efficient implementation.

1. Introduction

1.1 How this document is structured

Section 1 defines climate change adaptation and sets out the changes we are likely to face in the local climate of Wiltshire over the next century. It then goes on to explain what types of adaptive actions can be implemented to help us cope with these changes.

Section 2 sets out the methodology used by Wiltshire Council to meet level 2 of the 5 level adaptation process. Work undertaken in 2009 on the Local Climate Impacts Profile (LCLIP), which provided an initial assessment of current vulnerability of services to the weather, has been followed by the development of a comprehensive risk assessment to identify and prioritise service areas that are most at risk to future climate change.

This report presents the first assessment of both the highest level risks services face from individual weather¹ and climate² variables and the council services that have the highest overall vulnerability to climate change in both the near term up to 2015 and mid-term up to 2050.

Sections 3 and 4 approach adaptive actions within action plans and discuss implantation issues. Actions include existing measures the council is taking in the near term as well as long term actions that will help build greater resilience. The next steps will be to imbed a monitoring and review process of how climatic changes will impact priority services in the future and help identify further adaptive actions as well as recording progress on existing adaptive measures, this is covered in section 5.

1.2 Strategic context

Wiltshire Council has a key responsibility for addressing climate change through adaptation and mitigation both within its services and as part of its community leadership role.

This document is one of four action plans which form part of the council's [Energy, Change and Opportunity \(ECO\) Strategy 2011 – 2020](#), a framework document designed to identify how Wiltshire as a council and a community can act on climate change. The overarching framework document is to be supplemented by detailed action plans to set out more specifically how we are going to deliver our climate change ambitions.

The following four action plans that will be produced during 2011 and 2012 are:

¹ Weather is defined as the conditions in the air above the Earth such as wind, rain or temperature, at a particular time over a particular area. The duration of weather is short term and subject to frequent variation.

² The climate of an area is obtained by analysing the weather experienced, over a 30 year period. As a result the weather of an area can vary significantly from the climate.

- Carbon Management Plan for the council's emissions (published March 2011)
- **Climate Change Adaptation Plan for Wiltshire (this document)**
- Low Carbon Transition Plan for Wiltshire
- Renewable Energy Action Plan for Wiltshire.

The importance of addressing climate change is also recognised more widely by the Wiltshire community; the draft Community Plan 2011-26 identifies tackling climate change as one of its top three priorities. The Community Plan is the overarching strategic plan of the Wiltshire Assembly, setting out the long-term vision and priorities for the county to be delivered in partnership.

Addressing climate change adaptation is clearly a priority for both the council and the community and pre-dates the establishment of Wiltshire Council as a unitary authority. The Local Area Agreement 2008-2011 (the LAA) between central and local government identified a target for an adaptation plan to be produced by 2011. In 2009, the new Wiltshire Council re-committed itself to planning to adapt to climate change and began working through a process within set timelines to investigate how the impacts of climate change would affect services, staff, infrastructure, operations and the wider community and ensure that we are sufficiently prepared to manage the risks, build resilience and take advantage of any opportunities presented from the predicted climatic changes. An overview of the process based on the former national performance indicator NI188³, split into five levels, is outlined in section 1.8.2. Under the LAA, Wiltshire Council committed to achieve level 3 by the end of March 2011. Although this target was removed under the Comprehensive Spending Review in 2010 the council recognised the importance of this work and thus continued the work already set in process.

1.3 Why we need to adapt to Climate Change

The Fourth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC) in 2007 said that “it is very likely that anthropogenic (human) greenhouse gas increases caused most of the observed increase in global average temperatures since the mid- 20th century”.

The Royal Commission on Environmental Pollution suggests that substantial changes to our climate are now unavoidable. There is a compelling body of evidence indicating that current and historical anthropogenic greenhouse gas emissions (such as CO₂ from fossil fuel use in power stations, industry, manufacturing, transportation, and methane generated from landfill sites and agriculture) are increasing the concentration of greenhouse gases in the atmosphere. These gases enhance the natural process of the greenhouse effect, leading to increasing annual average temperatures. Globally, 2000 – 2009 was the warmest decade on record.⁴

³ Until 2010 Local Authorities reported their performance on adaptation against National Indicator NI188. From April 2011, however, the requirement to report on this indicator was removed. Wiltshire Council has continued to use the structure of the NI188 process in producing its adaptation action plan.

⁴ Noughties' confirmed as the warmest decade on record' ([Met Office](#))

The UK climate is changing to reflect these global patterns. Observations have shown that average Central England temperatures have risen by around 1.0°C since the 1970's. Winter precipitation rates have increased across the whole of the UK since the 1960's and snow cover has shown a strong downward trend over this time with the number of days of frost also decreasing. Sea levels around the UK have been rising by around 1mm per year during the last century and sea surface temperatures have also increased by 0.7°C over the past 30 years.⁵

Until recently the main political and scientific response to tackling climate change has been to develop mitigation measures to cut the levels of greenhouse gas emissions being released. Despite this drive to mitigate our emissions, both in the UK and around the world, the impacts from current and previous emissions will be experienced long into the future. This is due to the inertia of the global climatic system. Greenhouse gases, such as CO₂, can stay in the atmosphere for up to 100 years.

We need to adapt to climate change because even if all man-made greenhouse gas emissions ceased immediately, the influence of historical gas emissions already in our atmosphere will result in increasing temperatures, changing rainfall patterns, rising sea levels and more extreme weather events for the next 40 or so years up to the middle of the 21st century.

Decisions made now in regulating global emissions and the speed in which any reductions are implemented will influence the degree of climate change experienced from 2050 until the beginning of the next century.

⁵ Key Findings For Observed Data, UKCIP 2010

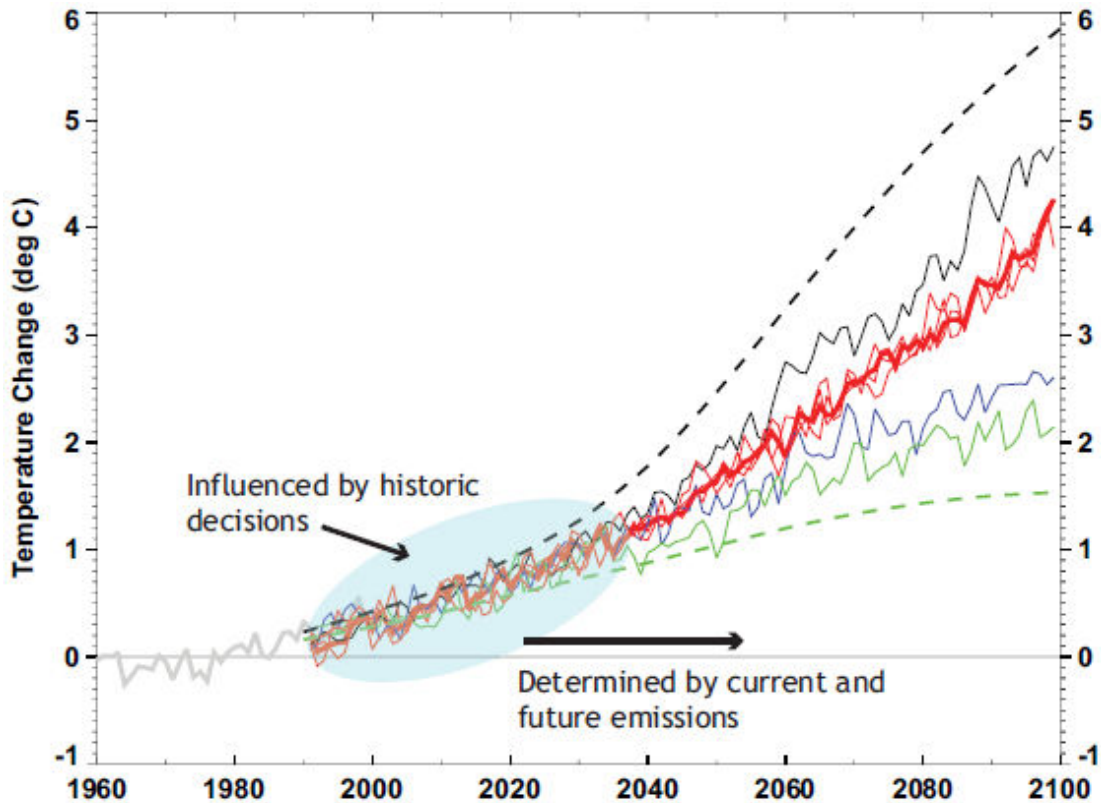


Figure 1.2: Climate change (UKCIP 2010)

The graph above illustrates the influence of historical emissions on the warming that will be experienced up until the middle of the 21st century. The shaded blue area denotes the amount of climate change to which we are already committed. The coloured lines show the possible increases in global temperature that may be experienced post 2050 depending on how much emissions are reduced.

Although individual weather events cannot be directly attributed to climate change, we are aware of the types of impacts faced from extreme weather incidences (which are predicted to increase as climate change develops) because we have already experienced many of these already, including heatwaves, droughts and flooding events.

Box 1: Examples of extreme weather impacts

In August 2003, a substantial heatwave across Europe caused over 30,000 additional deaths due to heat related illness or the exacerbation of existing conditions. In the UK there were around 2,000 premature deaths as a result of this heatwave yet the average summer temperature that year in the UK was only 2°C above the 1961-1990 summer average. *Defra 2010*

In 2007, severe weather affected many parts of the UK during June and July following the wettest May-July period since records began. On the 20th July, around one and a half times the average monthly rainfall for July fell across Gloucestershire in just one day. The resulting flooding destroyed homes, businesses and disrupted vital services including flooding of the Mythe water treatment works leading to the loss of clean drinking water to over 350,000 people for over a week and causing over 2 billion pounds worth of damage to property and infrastructure. *Severn Trent Water 2007& Met Office 2011*



1.4 United Kingdom Climate Projections 2009 (UKCP09)

In order to adapt our infrastructure and services, we have to know by how much the climate is likely to change and what temperatures and rainfall patterns we can expect. Making timely and proportionate changes to how we do things, to make sure that our investments, such as buildings and transport infrastructure, last for as long as they possibly can, makes good business sense. Effective decisions now can save money in the long term.

[The United Kingdom Climate Projections 2009 \(UKCP09\)](#) is the latest cutting edge climate modelling tool to help us plan and prepare for a future with climate change. It builds upon earlier modelling work (UKCIP02), and has been developed by the Hadley Centre, based at the Met Office in Exeter, in conjunction with the United Kingdom Climate Impacts Partnership (UKCIP) which is funded by Defra.

Unlike previous models which gave a single estimate of future change for a given climate variable (such as temperature or rainfall etc), UKCP09 provides probabilistic projections which show the potential range of possible changes. It also gives a clear indication of what is most likely within that range giving us a greater confidence of the local temperatures or precipitation patterns we are likely to experience in the future. More information and detail of UKCP09 and the range of outputs are provided in *Appendix 4*.

1.5 Future Climate in the UK

The results from UKCP09 Projections suggest a broad trend of **hotter, drier summers** and **warmer, wetter winters** across the whole of the UK by the end of the century with significant regional variations that will see average **summer temperatures rise** between 2.5°C in those areas least affected and 4.5°C in those areas most affected. Winter temperatures are expected to increase between 2°C and 3°C. This does not mean that cold winters and snow and ice, such as the 2009/10 winter, will become consigned to the past, as there will still be natural variability within our climate, they will just become less frequent.

Total annual precipitation rates will remain about the same. However, there is likely to be an increase of between 10 - 40% in winter rainfall and conversely a similar expected decrease in summer rainfall. Alongside these trends, we are expected to experience more **extreme weather events** with an increase in the frequency and intensity of **heavy rainfall**, leading to **flash flooding in summer** and saturated soils leading to **flooding in winter**. More frequent **heatwaves** are also expected along with continuing **sea level rise**. Appendix 2 describes projected changes to the UK and Wiltshire climate in more detail.

1.6 Future Climate Change in Wiltshire

According to the UKCP09 projections, by 2050 Wiltshire will experience hotter summers with an increase in average summer temperature of between 1.1 – 5.4 °C on the current average summer temperature. The hottest summer days could rise by as much as 9.5°C although it is more likely to be around 1.2-2°C. Average winter temperatures are also set to rise with an expected increase of between 0.9 - 3.8 °C on that which is currently experienced.

Total annual rainfall is unlikely to change, however, the patterns of rainfall could shift with total summer rainfall likely to decrease by around 20% and winter rainfall predicted to rise by around 15%.

A range of projections is presented in *Appendix 3* which shows how the county's climate (temperature, precipitation and humidity) will have changed by 2050. A series of maps is also presented in *Appendix 3* which shows the comparison between extreme weather events.

1.7 Definition of Climate Change Adaptation

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as “adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploit beneficial opportunities”.

Adapting to climate change is the process of building the resilience of businesses, industry, agriculture, natural environment, infrastructure, public services, households and vulnerable parts of our society. It will help us to prepare for the expected impacts of climate change, such as flooding, heatwaves, droughts and extreme weather events, and gives us the best chance to take advantage of any opportunities which may be presented as a result of these changes.

1.8 The Different Types of Adaptive Actions

The UK Climate Impacts Programme (UKCIP) helps organisations and local authorities adapt to climate change. It categorises adaptation as measures or strategies that contribute to one of the following:

- **Building Adaptive Capacity** - by gathering information (collecting data, conducting research, producing reports, monitoring and raising awareness), creating a network of likeminded organisations to work together and providing regulations, legislation and guidance to enable adaptation actions to take place.
- **Delivering Adaptive Actions** – implementing adaptive actions that help to reduce our vulnerability to climate risks both now, and in the future or take advantage of any benefits that these changes may bring. These actions can be illustrated by physical examples, such as increasing the height of a flood defence wall or installing external shading above south-facing facades of buildings or non-physical actions, such as changing the school calendar to reduce the exposure of schoolchildren to heatwave conditions, or installing early warning systems for local flooding (see the box below).

Recognising the threat that climate change adaptation poses to the county of Wiltshire, the council will be working to build adaptive capacity and to deliver adaptive actions. For the former this action plan serves as the foundation for future work with other public sector organisations in Wiltshire. For the later, council departments will be encouraged to adopt mitigating measures to reduce the risk a changing climate poses to services.

The scale and nature of the adaptation actions required will be dependent upon future levels of greenhouse gas emissions and how these changes in climate affect the environment, economy and wider society.

Box 2: Example of a potential adaptive action

An example of an adaptive action would be to prevent some of Wiltshire's road surfaces across the county from melting during high summer temperatures. This could take the following steps:

- Identifying sites across the county where rural road surfaces have been melting during hot summer days
- Reviewing the current materials and techniques used to surface our roads
- Making any changes necessary to the composition or colour of the surface dressing to prevent road surfaces from melting as temperatures rise in the future
- The possible use of trees or vegetation to provide shade for particularly vulnerable roads which face due south.

1.9 Key Drivers for Climate Change Adaptation

There are many reasons, including financial, social and environmental benefits, why we should choose to adapt to changes that may arise from climate change.

In 2006, the Stern Review on the Economics of Climate Change drew the conclusion that the benefits of strong, early action on climate change considerably outweigh the costs and suggests that climate presents a unique challenge for economics.

Sir Nicholas Stern, the Review's author, was quoted as saying "Adaptation to climate change, that which is taking steps to build resilience and minimise costs, is essential. It is no longer possible to prevent the climate change that will take place over the next two to three decades, but it is possible to protect our societies and economies from its impacts to some extent."⁶

A number of legislative drivers and policy commitments also encourage action on climate change adaptation in the UK.

1.9.1 Climate Change Act 2008

In 2008, the Climate Change Act was passed making the UK the first country in the world to introduce a legally binding emissions reduction target of an 80% cut in national

⁶ [Stern Review](#) Final Report, 2006

greenhouse gas emissions from 1990 levels by 2050. Although the Climate Change Act's main focus is on mitigating emissions, it also provides a statutory framework for planning and implementing adaptation and includes the establishment of the Adaptation Sub-Committee (ASC). The Act also identifies a range of organisations (water and energy companies etc, but not including Local Authorities) that have a duty to prepare adaptation reports that outline the key impacts of climate change upon the functions of their organisation and develop proposals and policies for how to prepare for these risks.

The ASC has interpreted its statutory remit broadly, and describes its role as “to advise on the development of a UK Climate Change Risk Assessment, to assess the preparedness of the UK to meet the risks and opportunities arising from climate change, and to promote effective actions to adapt to climate change by society as a whole”.

A UK-wide Climate Change Risk Assessment, to identify which key assets and infrastructure are most at risk and begin to formulate plans to cope with these impacts is being developed by DEFRA for January 2012. Subsequent assessments will be published every five years after that.

1.9.2 National Indicator 188 (NI188)

Local authorities were not included in the reporting powers of the Climate Change Act because until November 2010 local authorities had to report through the Local Government Performance Framework and National Indicator 188: 'Planning to Adapt to Climate Change'. In 2009 Wiltshire's Local Strategic Partnership (LSP) adopted National Indicator 188 within its Local Area Agreement.

In November 2010 central government announced that performance monitoring through Local Area Agreements and the National Indicator Set was to come to an end, removing the council's requirement to report its work on adaptation to Defra. However, with the importance of adaptation acknowledged by Wiltshire Council it was considered the best course of action was to continue using the framework for the indicator and self assess on progress.

The framework aims to ensure local authorities identify and manage weather and climate related risks to service delivery, assets and infrastructure and the wider community and are in a position to make the most of new opportunities presented by these changes.

The framework is process based and sets out a five-stage process for climate change adaptation, including making a public commitment, undertaking a climate change risk assessment of service delivery infrastructure and assets, developing an action plan to address the risks and implementing that plan. The framework also identifies the need to include the Local Strategic Partnership in the forming and delivery of any adaptive actions. The levels are shown in Table 1.8.

Appendix B – Climate Change Adaptation Action Plan

Level	Description/ Requirement
0	Getting Started
0.1	Initial Project Planning
0.2	Engagement of Community, Service Users and Key LSP Partners
0.3	Scoping Project Resources
0.4	Identifying a Baseline
0.5	Supplementary Aim - Developing a Vision
1	Public Commitment and Impacts Assessment - Assembling an Evidence Base
1.1	Include other Expertise, Leadership and Public Commitment
1.2	Understanding Current Vulnerability
1.3	Identifying Some Significant Potential Impacts from Future Weather and Climate
1.4	Sharing the Load and Ongoing Project Planning
1.5	Supplementary Aim - Monitoring Future Impacts
1.6	Supplementary Aim - Weather and Climate Database
2	Comprehensive Risk Assessment
2.1	Comprehensive Assessment of Potential Impacts
2.2	The Risk-Based Assessment Revealing Priority Issues
2.3	Identify Priority Actions
2.4	Implement Priority Actions
2.5	Integrate LSP Partners
2.6	Supplementary Aim - Monitor New Business
2.7	Supplementary Aim - Monitor Effectiveness of Early Adaptation Measures
3	Comprehensive Action Plan (and prioritised action plan in priority areas)
3.1	Developing a Comprehensive Adaptation Action Plan
3.2	Embedding Climate Risks into Decision Making
3.3	Implementing Adaptation Responses
3.4	Supporting LSP and Partner Organisations
4	Implementation, Monitoring and Continuous Review
4.1	Monitoring Implementation of Plan
4.2	Monitoring Performance of Adaptation Actions
4.3	Review and Updating of Plans

Table 1.8: Adapting to Climate Change 5 level process

Wiltshire council reached Level 1 in April 2010 and completed the Local Climate Impacts Profile (LCLIP) in June 2010. This study reviewed the current vulnerability of council services assets and infrastructure to extreme weather events over the past 10 years.

In December 2010 Wiltshire Council reached Level 2 with the completion of the comprehensive risk assessment as detailed in this report. Under the former Local Area Agreement, Wiltshire's LSP had committed to reach Level 3 during 2011.

1.9.3 Nottingham Declaration

The Nottingham Declaration is a voluntary pledge by local authorities to address the issues of climate change. It is a high-level, broad statement of commitment that over

90% of English councils have signed⁷, including Wiltshire Council, which demonstrates public support for action to reduce carbon dioxide emissions from our own activities and those within the community that contribute to climate change. It also requires signatories to assess the risks associated with future climate change, identify the implications for their services and communities and develop plans and policies to adapt accordingly to these changes.

1.9.4 Civil Contingencies Act (2004)

The Civil Contingencies Act 2004 places a responsibility upon local authorities to develop plans for dealing with emergencies including extreme weather events.

1.9.5 Flood and Water Management Act (2010)

The 2010 Flood and Water Management Act requires upper tier local authorities to create local flood risk management strategies, carry out flood risk management work and develop a register of structures or features which may have a significant impact on local flooding.

1.9.6 Local Government Act 2000 – Well-being powers

The Local Government Act 2000 introduced the well-being power. It increased a Council's capability to act on behalf of its area and allows the Council to do anything that it considers likely to enhance the economic, social or environmental well-being of their area unless expressly prohibited elsewhere in legislation.

1.9.7 Planning Policy Statements

Two pieces of planning legislation which require adaptive actions include: i) the Planning Policy Statement: Planning and Climate Change – Supplement to Planning Policy Statement 1, requiring applicants for planning permission to consider mitigation and adaptation when considering new developments or refurbishments; and ii) Planning Policy Statement 25: that requires flood risks to be taken into account to avoid inappropriate development in areas of high flood risk.

1.10 Barriers to Adaptation

Despite a high degree of certainty that most, if not all, businesses, local authorities, and wider communities will be affected by changes in our climate, their willingness and ability to adapt are often impaired by both real and perceived social, financial, political and psychological barriers, including;

⁷ Energy Saving Trust, 2011

1. Limited understanding and recognition of climate risks and vulnerabilities – both now and in the future
2. Climate change is not seen as a significant problem at present - the temptation exists to wait for the impacts to occur and then react
3. Lack of financial support or limited budget
4. The short-term nature of decision making
5. Lack of support in regards to policies, legislation, regulations and standards and design guidance
6. Lack of technical expertise available to implement adaptation
7. Lack of fully appraised pilot projects
8. Social, political and cultural conflicts

Other barriers relate to uncertainty that exists within the climate projections as to how great or small these climatic changes will be and the fear of '*Mal-adaptation*' – that is to implement an adaptive action which turns out to be inappropriate in scale or cost.

To overcome these barriers it is important to first raise understanding of the future projected changes in temperature and precipitation. Then we need to relate how these changes will impact local residents, businesses and the natural environment and instigate more collaborative working to help find local solutions to problems faced.

2. Assessing the Risks for Wiltshire Council

2.1 Introduction

In section 1.9.2, above, the five stages of the adaptation process were outlined. This report forms stages 2 and 3 of the NI188 five-stage process as restated below;

- Level 0 Getting started
- Level 1 Public commitment and impacts assessment
- **Level 2 Comprehensive risk assessment**
- **Level 3 Comprehensive adaptation action plan**
- Level 4 Implementation, monitoring and continuous review

2.2 Risk Assessment Methodology

There is no national or regional agreed methodology for the completion of the level 2 Comprehensive Risk Assessment. However the Central Government national guidance provided by LRAP (LRAP - Adapting to Climate Change Guidance Notes) on NI188 states that the objectives of Level 2 must achieve the following:

“The Authority has undertaken a comprehensive risk based assessment of vulnerabilities to weather and climate, both now and in the future, and has identified priority risks for its services”.

It goes on to say that from this comprehensive assessment of potential impacts it will be possible to identify priority areas for action and that these priorities must be established using a rigorous (repeatable) risk-based approach in order to ensure that impacts are dealt with in a proportionate way. The guidance also suggests that the risk assessment should be informed by the risk procedures that are generally used by the local authority.

In order to achieve this and to ensure council-wide engagement and that the climate and weather risks were dealt with in a proportionate way, Wiltshire Council adapted an approach originally used by Dorset Council combining it with Wiltshire Council’s risk assessment methodology.

2.2.1 Identifying areas of assessment

The initial stage in developing the risk assessment methodology was to identify how the council’s services at risk from future climate change could be approached for assessment. Wiltshire Council’s five departments were assessed for the production of the adaptation action plans as follows:

- Department of Transformation and Resources
- Department of Adult Social Services

- Department of Children Services
- Department of Public Health and Protection

The Chief Executive's Office and did not complete the risk assessment. At this stage it was decided that this comprised of internal services which did not incur independent risks from those covered by the other 4 departments.

The 4 departments were broken down into meaningful service areas. Each Head of Service was then briefed and asked to supply names of appropriate key officers for each of their service areas identified. These officers were subsequently interviewed in order to complete the risk assessment.

Following the determination of service areas, the technical criteria to be used within the assessment methodology were established.

2.2.2 Emissions Scenario

UKCP09 established three emissions scenarios; low, medium and high. Wiltshire Council has selected the medium emissions scenario for our adaptation work. A full explanation is given in Appendix 4.

2.2.3 Timescales

The aim of the Comprehensive Risk Assessment is to consider service vulnerabilities to weather and climate both now and in the future. Therefore the risk assessment was formed in two parts; a near term and a mid term analysis. The near term, from 2010 to 2015 considered existing weather variables. This is because the UKCP09 projections can only be used with greater confidence after 2015. Before this time historical weather data is used to predict what likely weather patterns we will experience.

The mid term assessment views the period up to 2050 and considers likely changes in the climate as modelled by UKCP09. This timescale was selected as the most significant risks from climate change are likely to occur in the longer term, and would not be captured if simply assessed in the short term up to 2015.

2.2.4 Weather and Climate Variables

Once the timescales for the risk assessment were established, it was important to develop a set of weather and climate variables against which risks would be scored. As previously stated, UKCP09 identifies the longer-term climate change trends from 2015 onwards including, hotter summers and warmer winters. However, prior to this period it is important to acknowledge that these trends are less obvious and the use of existing weather variables is most suitable.

In the near term assessment (2010-2015), five weather variables were specified. These were determined using basic projections of local weather data and the findings from the LCLIP which identified several actual extreme weather events.

The six variables are:

- Excessive rainfall & flooding
- High wind speeds
- Snow, ice and freezing conditions
- Heatwaves and higher temperatures
- Droughts & water shortages

In the mid term assessment seven climate and weather variables were identified; all five of the weather variables from the near term scenario, plus two climate variables identified from UKCP09 which are indicators of regional, national and global climate change impact.

The additional climate variables are:

- Hotter drier summers
- Warmer wetter winters

2.2.5 Likelihood and Vulnerability

Once the council services, timescales and the weather and climate variables had been identified it was time to consider how to score the impact of these variables on a particular service. Guidance suggests that the risk assessment should be informed by the risk procedures that are generally used by the local authority and so the starting point was the Wiltshire Council corporate risk scoring matrix.

Both *Likelihood* and *Impact* parameters are based on the council's 1-4 scale (see figure 2.2). Likelihood uses the following rankings; rare, unlikely, possible, almost certain. Impact uses insignificant, minor, moderate, and significant - (see Appendix 5 *Risk Scoring Criteria*). This gives a score between 1 and 16 for each variable. Any score between 1 and 4 is considered a low risk; 6 to 9 is considered medium risk and anything exceeding 12 is considered a high risk.

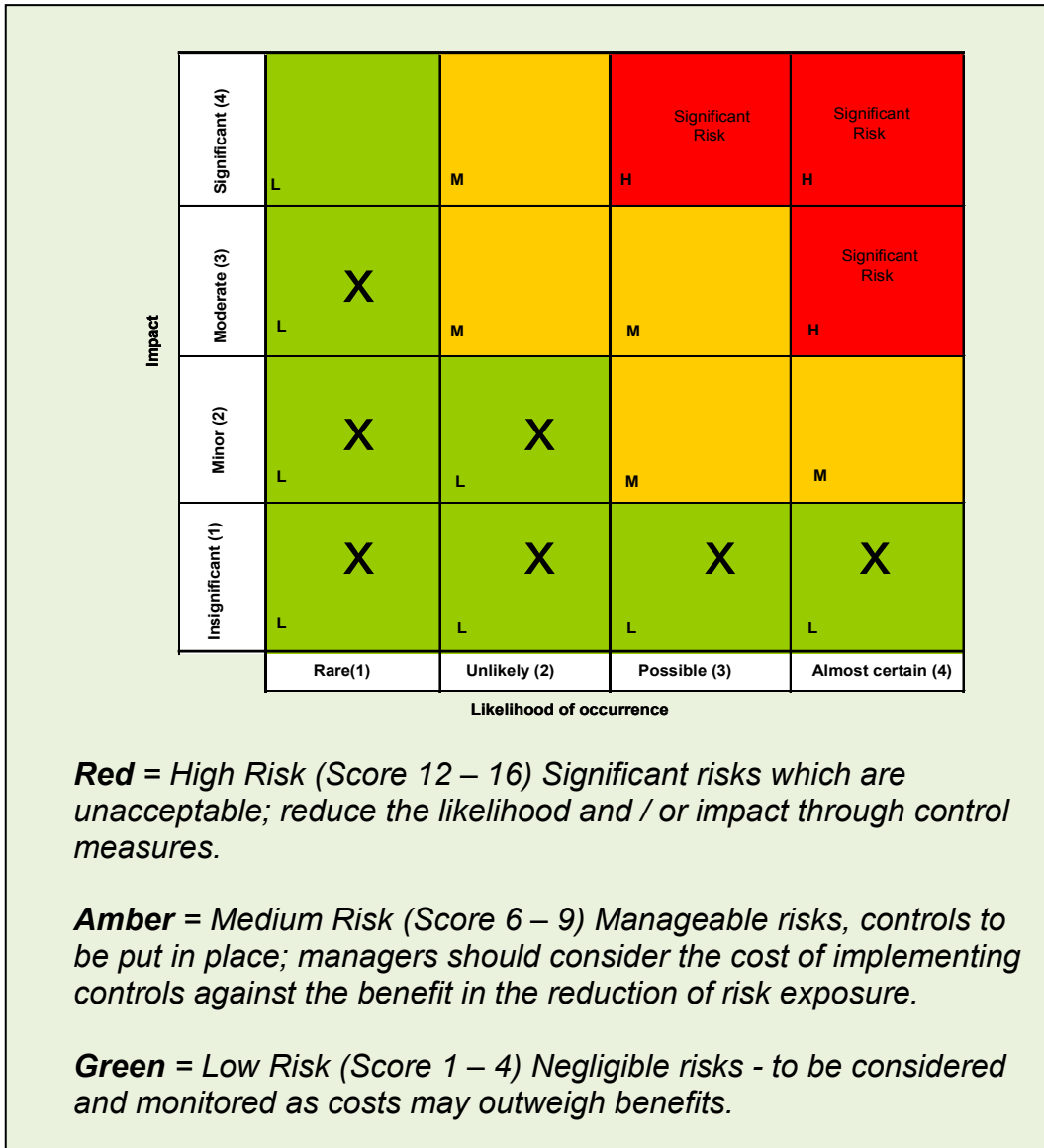


Figure 2.2: Risk Scoring Matrix

In order to ensure consistency and reduce subjectivity, the Likelihoods were fixed in advance rather than scored by officers. These decisions were based on weather and climate data using the near term historical weather information for Wiltshire and the mid-term risk assessment data from the UKCP09 medium emissions scenario.

Vulnerabilities were scored by the key officers interviewed, who represented each service area. To help them determine a consistent level of impact the information in *the Impact Assessment Matrix* in Appendix 5 was used. This required officers to take into account nine considerations:

- Effect on service
- Reputation
- Personal Safety
- Personal Privacy Infringement
- Failure to provide statutory duties/ meet legal obligations

- Financial
- Effect on project objectives schedule deadlines
- ICT
- Environmental

These are the same considerations used in the current Wiltshire Council assessment of corporate risks.

The Adaptation Plan risk methodology includes an additional overall risk rating for services areas that is not part of the corporate risk methodology. This is achieved by totalling together the single risk score for each of the individual weather and climate variable scores in a particular service area.

Despite this slight difference between the Climate Change Adaptation Risk methodology and the corporate risk methodology, the overall risk ratings are comparable.

2.2.6 Assessing the risks with service managers

It was decided that group work was not conducive to a deep understanding of each service area. Consequently interviews were carried out one-to-one or in pairs. The outcomes of these risk assessment interviews formed the basis for the adaptation action plans and an example is shown in Figure 2.2.6. Prior to the interviews, an awareness raising exercise was carried out through two half-day workshops on climate change adaptation. These were delivered to a total of 56 managers and officers from across the council and 7 representatives from partner organisations during summer 2010. The aim of the workshops was to explain the necessity for adapting to a changing climate.

Appendix B – Climate Change Adaptation Action Plan

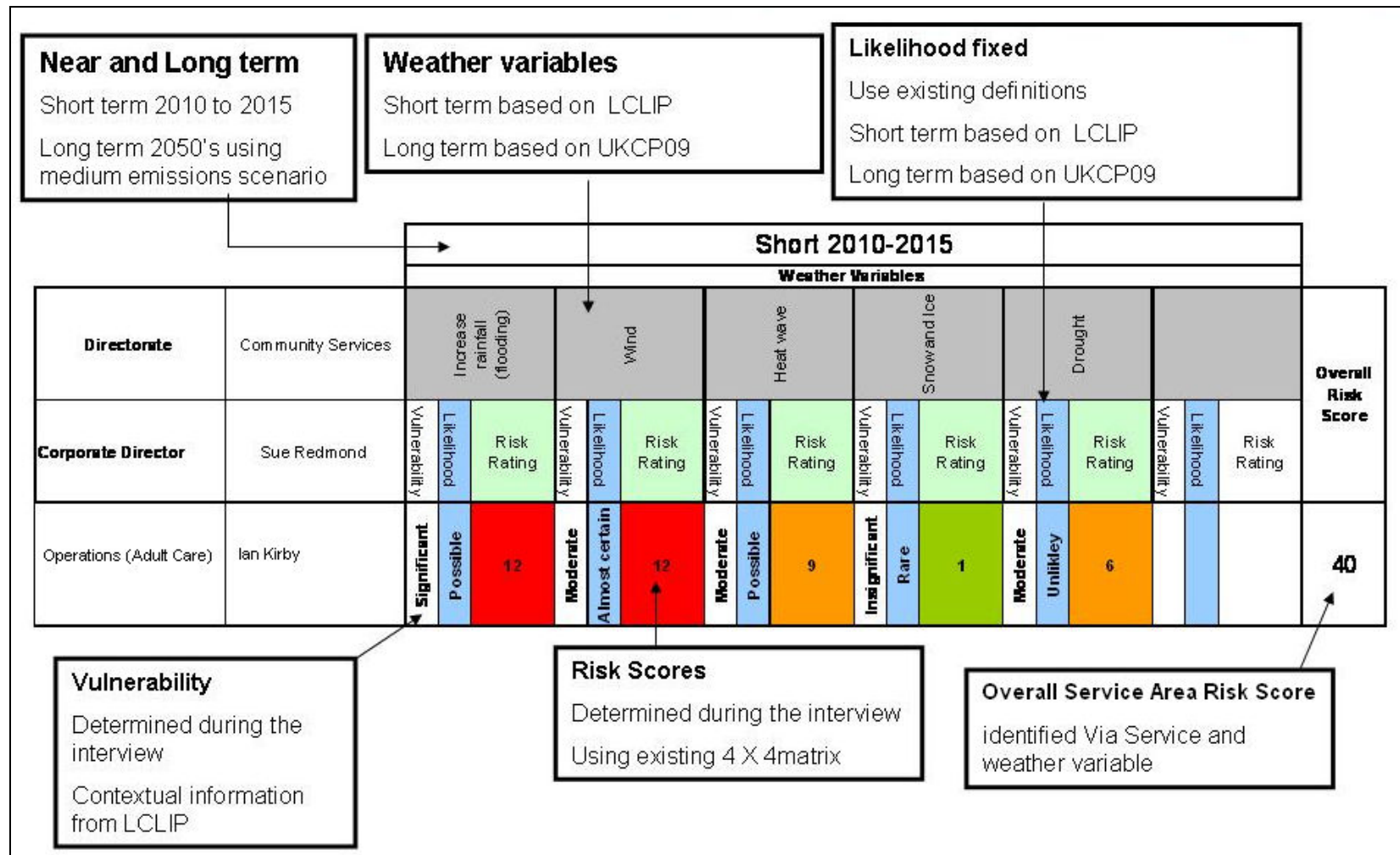


Figure 2.2.6 - Example of the risk assessment process

2.2.6 Peer Review within the council

The Resilient Council Group (RCG) is made up of performance and risk managers and risk leads, council insurance, emergency planning and business continuity representatives. The approach to the Comprehensive Risk Assessment was presented to the RCG in May 2010. The RCG were asked to approve the methodology to ensure that the risk assessment work would fit within the council's existing risk assessment systems.

The corporate likelihood scoring criteria included in Appendix 5 is based on a description of occurrence and timeframe indicators.

The timeframe indicator considers an occurrence of an event *rare* unless it has happened within the last 3 years. If future climatic risks are assessed using the 3 year logic, the likelihood of the risk occurring can be expected to reduce to irrelevant. For the purpose of the Adaptation Plan Risk Assessment, risk likelihood is categorised against the UKCP09 occurrence percentages so that the importance of impacts for the council can be understood.

For this reason the risks identified through the climate change adaptation risk process are for the purposes of the adaptation action plan only. Otherwise the methodology was considered sound and appropriate and was endorsed. As well as approving the amended methodology, the RCG acted as a '**critical friend**' during various stages of the process and received regular updates on progress.

2.3 Risk Categorisation and Reporting

In order to ensure that all risks identified have been effectively reported, three approaches have been used;

1. The first considers individual high level risks from a single weather or climate variable for a particular service area
2. The second looks at overall service area risks (which relate to an overall total risk from the complete range of weather or climate variables)
3. The third identifies weather or climate related risks to the whole department or Local Authority (this is a summary across a number of assessments). These are explained further below.

2.3.1 Weather or Climate Specific Service Risks

A weather or climate specific service risk is the vulnerability of a single service to a particular weather or climate variable multiplied by the likelihood of that

one particular weather or climate variable occurring. Any risk score above 12 was considered high based on the 1-4 risk matrix described in 2.2.5 above. This shows an acute and specific vulnerability that a service may suffer from and is therefore important to highlight separately from any overall service area risks described below. Once identified within the risk assessment procedure, weather and climate risks were incorporated into the departmental action plans in section 3.

2.3.2 Overall Service Area Risks

This is the overall risk score for a particular service area and is the accumulated total of all the individual weather and/or climate specific risk scores for each timescale.

2.3.3 Weather or Climate Specific Department Wide Risks

The final method of assessing risk is the total of the scores for each climate or weather variable against all service areas within a department. These were totalled for each timescale. For example, in the mid-term in the Department of Transformation and Resources the scores show that hotter drier summers pose a significantly higher risk to all services than any other variable.

2.4 Prioritising Risks and Opportunities for Wiltshire Council

Within the Council, over 60 officers and service managers were briefed and interviewed on the risk assessment process. A total of 113 individual services from the 4 departments were considered; 72 in Transformation and Resources, 9 in Public Health and Protection, 12 in Adult Social Services and 20 in Children Services.

The outcome of this process was a long list of potential impacts and opportunities across all parts of the authority. It was important to keep this list proportionate (by not including what appeared to be trivial impacts) so a brief summary report for each department was drafted which established only high level risks associated with a specific service from either a weather or climatic variable and moderate or high level overall risks for a service area.

From this comprehensive assessment of potential threats and opportunities it was possible to identify priority areas for action. These priorities were then input into an action plan template and a range of adaptation measures were considered by the original identifier. The action plan templates are informed by the council's risk assessment procedure ensuring they were dealt with in a proportionate way and also allows for the process to be repeated in a continuous cycle. See *Figure 2.4* overleaf.

This process generated five themed action plans for which a range of adaptation responses were developed. In some cases only a few sensible options existed - in others serious consideration was required to assess the benefits of different adaptation responses. Some issues require immediate practical adaptation responses whilst others require more extended periods of investigation including research and cost-benefit appraisal.

DRAFT

Appendix B – Climate Change Adaptation Action Plan

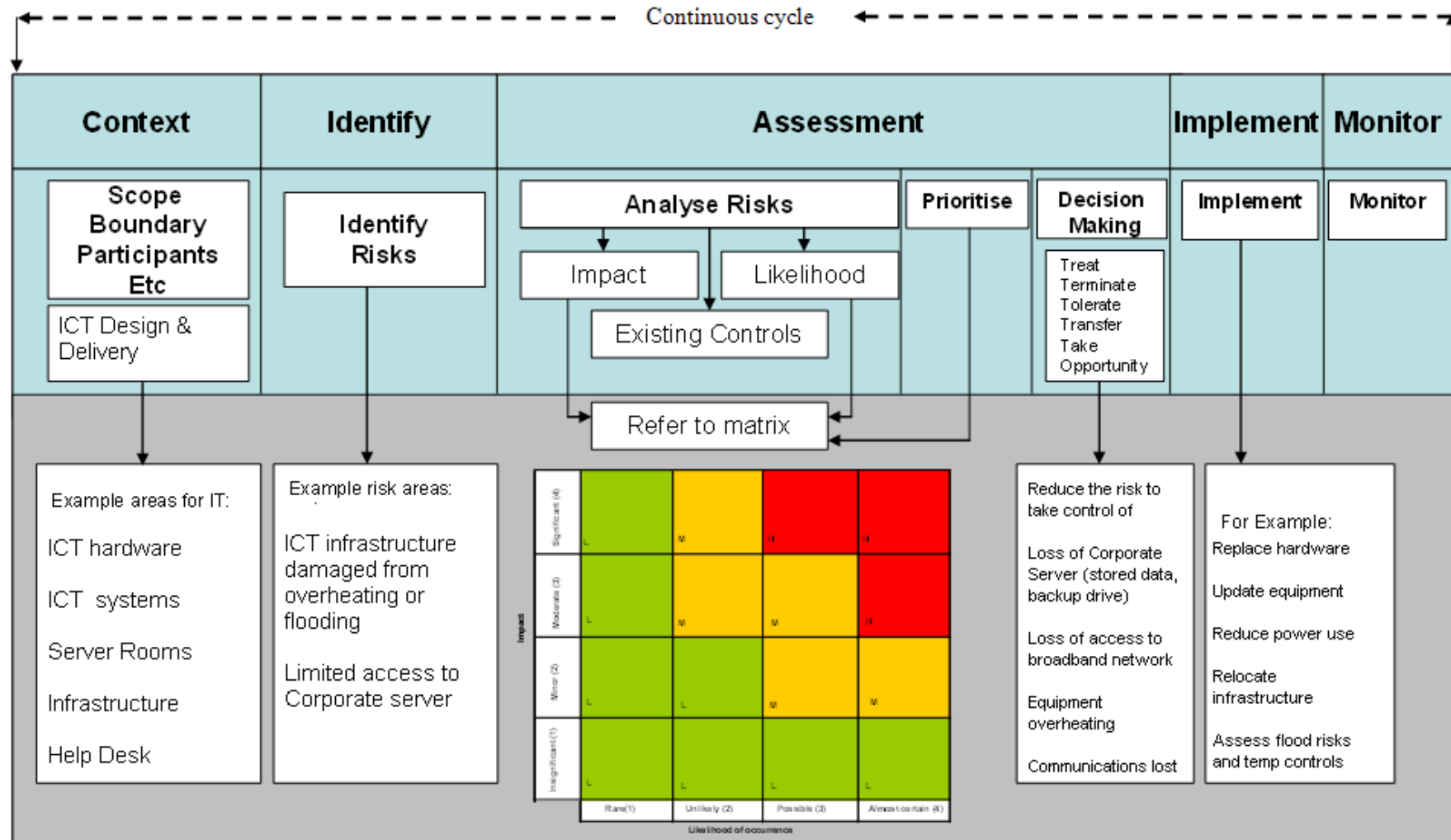


Figure 2.4: - Example for the overall process

3. Adaptation Action Plans

3.1 Risks and opportunities associated with each service

Climate change will directly affect Wiltshire Council and its services. The adaptation action plans set out Wiltshire Council's approach to tackle these affects. Table 3.1 below details the number of risks and opportunities found within each service area assessed.

Department or service area	Risk			Opportunity
	H	M	L	
Transformation and Resources				
Economy & Enterprise				
Spatial Planning	6	2	2	1
Economic Development & Regeneration	1	1		1
Energy, Change and Opportunity (ECO)				
Housing				
Private Sector Housing	1			
New Housing	1			
Homes 4 Wiltshire				
Housing Options				
Housing Management	2			
Strategy & Support				
Development Services				
Development Control (Planning Enforcement)	1			
Building Control				
Conservation Built Environment		1		
Neighbourhood Services				
Weather Emergencies	3	1		1
Streetscene				1
Highways Area offices		3		1
Drainage	3			
Car Parking				1
Countryside Services	2	3	1	
Leisure				
Rights of Way				
AONB's	2	2	1	
Markets and Fairs				
Corporate Vehicles, plan and equipment				
Gypsy and Traveller services				
Strategic Services				
Passenger Transport- operations		1	1	
Passenger Transport- policy				
Transportation policy		1		
Highways Development Control				
Traffic Orders				
Highways Asset Management	2	1	2	1
Bridges and Structures	1			
Highways and Transport Construction	2		2	1
Waste Management Services	1			
Waste Contract				
Landfill				
Waste collection				
Shared Services & Customer Services				
Occupational Health & Safety				
Shared Finance				
SST HR & Payroll			1	
SAP Support				
Registration & Statutory Support Services				
Customer Access				

Appendix B – Climate Change Adaptation Action Plan

Department or service area	Risk			Opportunity
	H	M	L	
Finance & Procurement				
Budget Reporting				
Revenues & Benefits				
Internal Audit				
Pensions				
DO Finance				
DCE Finance				
DCS Finance				
Project Management				
Strategic Financial Planning & Procurement				
HR & Organisational Development				
Learning & Development				
Strategic HR	1			
HR Project Management, Pay Harmonisation				
HR Advisory Service				
Business Transformation, ICT and IM				
Business Transformation		2		
Information Management		2		
Business Support and Customer Liaison				
ICT Programme		3		
ICT Design & Delivery		2		
Applications				
Legal & Democratic Services				
Democratic Services				
Electoral Services				
Governance & Coroner		1		
Legal Services				
Performance and Risk	1			
Business Arrangements				
Performance Manager				
Strategic Property Services	1			
Corporate Maintenance	5	3	2	2
Facilities Management	8	2	1	3
Estates & Valuation		1		
Strategic Property & Developments	1		2	1
Rural Estates	2	4	2	
Adult Social Services				
Strategy and Commissioning				
Mental Health				1
Social Care Policy				
Commissioning (OP/PI)	2	1	1	1
Transformation				
Commissioning (LD)				
Libraries				
Community, Libraries, Heritage & Arts Learning & Development				
Heritage & Arts				
VCS Strategy				
Equalities				
Community Governance & Innovation				
Children Services				
Children and Families / Social Care Services				
Area Social Care Services	1			
LACHES / HT - Looked After Children, Virtual Head Teacher				
Disability Teams				
Fostering & Adoption				
Family Support				
Aftercare				
Corporate Parenting Care Matters				
Schools and Learning				
School Buildings & Places	1	1		

Appendix B – Climate Change Adaptation Action Plan

Department or service area	Risk			Opportunity
	H	M	L	
Early Years				
School Improvement			1	1
Special Educational Needs				
Collaborative Partnerships				
Business & Commercial Services				
Targeted Services				
Youth Offending Team				
Connexions				
Educational Psychology Services	1			
Development Service for Young People				
Children's Commissioning & Performance				
Performance Management and Co-ordination				
Staff Development				
Finance				
Dept. of Public Health & Protection	1	1	1	
Public Protection & Community Safety				
Environmental Protection	4	2		
Licensing				
Pest & Dog Control				
Food Safety				
Health & Safety				
Consumer Protection	1			
Business & Operational Support				
LAIO / Out of Hours				
Community Safety	1	1		

Table 3.1: Number of risks and opportunities (Op) identified within each department's service area.

3.2 Themes used to structure action plans

Five key themes have been used to structure the adaptation action plans. Appendix 1 summaries the adaptation action plans within each of the five themes.

Social

Whilst climate change will impact on everyone there are vulnerable groups who will be most at risk from the adverse impacts. Ensuring that our response takes account of people's well-being will be vital. In implementing adaptation actions, the council will identify those groups most at risk from climate change and respond appropriately. Our social response will ensure that we take account of issues such as health – a major issue in a changing climate.

Financial and Economic

In the long run the costs of not adapting to climate change will far exceed any potential benefits from climate change. The council and the local economy will need to adapt, not only to the risks, but also to the potential opportunities a changing climate can bring.

Environmental

Both the built and natural environments must complement each other. Wiltshire is working hard to develop solutions that ensure this through

innovative approaches that also adapt to a changing climate. Our Green Infrastructure Strategy is an example of this, setting out new grounds-maintenance practices and new plant types that are more resilient to drought. We will make the most of the built and natural environment to ensure that they can work with each other to increase resilience to climate change.

Emergency planning and business continuity

The safety of the local community is dependent on comprehensive emergency planning strategies. A proactive response to changes in climate, as well as ensuring the council is prepared for the risks, will minimise the effects on business continuity and our local economy as a whole. Working closely with the council's Emergency Planning Unit will be key in delivering comprehensive responses to climate events and ensuring that services can still be delivered in the event of an extreme weather event.

3.3 Areas of cross cutting work

During the risk assessment process a number of impacts were identified that covered more than one of the themes outlined in section 3.2. For the council to successfully mitigate these a co-ordinated response from a number of different service areas will be required.

Those impacts identified that require a response from a number of different services have been highlighted in table 3.1.

4. Implementation

4.1 Communications

This comprehensive action plan focuses on delivering business continuity across all council services and requires both the building of adaptive capacity by raising awareness and implementing adaptive actions. It is therefore critical that the importance of adapting to a changing climate is communicated to all areas of the council.

Internally, there is already a strong message for the importance of acting on climate change issues. This plan will be disseminated by the Corporate Leadership Team to all service areas across the council as one of the four action plans that are included in the overarching ECO Strategy.

4.2 Strategic Issues

The process of working through the adaptation framework and developing the adaptation action plans raises a number of strategic issues for future implementation of adaptation responses.

In particular, the effectiveness of implementation depends on leadership on climate change issues; the extent to which climate change issues are embedded within decision-making and delivery; and the continued need to build the adaptive capacity of Wiltshire Council. Finally, the resources with which actions will be delivered are an important issue and are considered in section 4.3.

Leadership

Strategic ownership and oversight of the climate change adaptation plan is undertaken by the ECO Board. Chaired by the Cabinet Member for the Environment, it includes directors from across the council. The full membership is presented in below.

- Cllr Toby Sturgis, Cabinet member for Environment (Chair)
- Carlton Brand, Corporate Director for Transformation and Resources
- Alistair Cunningham, Economy & Enterprise Director (Project Sponsor)
- Parvis Khansari, Strategic Services Director
- Laurie Bell, Director of Policy & Communications
- Michael Hudson, Chief Finance Officer
- Mark Stone, Transformation Programme Director
- Jacqui White, Business Services Director
- Tracey Carter, Waste Management Services Director
- Mark Smith, Neighbourhood Services Director
- Stephanie Denovan, Schools and Learning Director
- Niki Lewis, Communities, Libraries, Heritage & Arts Director
- Ariane Crampton, Head of Climate Change

The Board's Terms of Reference are as follows:

WILTSHIRE COUNCIL ECO BOARD

Terms of Reference

The Board will:

- Champion and provide leadership on climate change work
- Set and review strategic direction and targets
- Own the scope of the climate change programme and prioritise carbon reduction projects
- Monitor progress towards objectives and targets
- Remove obstacles to successful completion of climate change projects
- Review and champion plans for financial provision of climate change projects
- Ensure there is a framework to co-ordinate climate change projects

The Board will meet on quarterly basis or more often if deemed necessary. Minutes and action points from the meeting will be recorded and distributed to members.

There is an excellent level of engagement of senior council officers on climate change issues and this is accompanied at grass roots levels with the introduction of the Green Champion network.

The Green Champion network aims to increase environmental awareness amongst staff and reduce the environmental impact of the council. It achieves this through monitoring environmental performance, staff engagement and delivering practical initiatives. The network was launched in October 2010 and currently comprises more than 50 members at council sites across the county. These include the principal office hubs, libraries, leisure centres and depots. Work to date includes campaigns to reduce the environmental impact of staff travel and a switch off campaign to reduce the energy consumption of our offices.

The network is an obvious and effective mechanism for reminding Council staff of the commitments to climate change adaptation.

Embedding

The risk-based approach developed for this adaptation action plan has been a large exercise led by the ECO team. As discussed within section 5 the intention is to revisit the process in the future to ensure an appropriate action plan is maintained.

The initial intention for the individual risks identified was to include these in service risk registers ensuring ownership and regular monitoring by the service in question. However, as the council's risk assessment process does not project as far ahead as the climate change adaptation risk assessment, it is not appropriate to incorporate adaptation risks into departmental risk registers. For this reason the Corporate Leadership Team should ensure that all forward business plans for teams consider and incorporate adaptation issues with a view to mitigating risks.

The inclusion of climate change considerations at a cabinet level should also ensure that climate change issues are considered at key stages of decision-making within the council. Embedding climate change in key policies, plans, programmes and projects will continue to be a priority. There are big opportunities to influence the delivery of adaptation measures across Wiltshire through the Local Development Framework and through procurement.

Some of the council's partners are already considering climate change-related risks within their organisations, such as Wessex Water who are involved in the Local Resilience Forum, along with Fire & Rescue and the Police. An action during 2011/12 will be to work more closely with these and other partners to share experience, co-ordinate action and encourage other partners to follow in their lead.

Building adaptive capacity

A county-wide awareness raising and behaviour change programme will be developed to extend the work carried out on council services. The ECO team are working with the Communications team to establish a climate change communications plan. This will work towards ensuring that the council is embedding climate change messages within all appropriate communications campaigns. There is an opportunity to develop a co-ordinated programme and campaign with partners such as the primary care trust (PCT).

Wiltshire Council has already made considerable efforts to raise awareness of climate change through the adaptation workshops for officers (section 2.2.6). Further training and guidance will be considered for external partners with specific focus on the private sector, third sector and businesses.

4.3 Finance and Resources

There are few extra resources for climate change adaptation actions, which will need to be built into existing work programmes across all departments of the council. However, new budgets can present opportunities for building in adaptation measures to save money in the long term. The Stern report highlighted that it will be cheaper to adapt now than be forced to adapt later.

The majority of adaptation actions which involve building adaptive capacity through embedding climate change into policies and plans and raising awareness will cost little and can be easily absorbed into existing business plans and budgets. Some actions, such as changing planting regimes to more climate-resilient species, modified maintenance regimes, or using existing communication techniques will also easily be absorbed into existing budgets.

Low costs (under £20K) may be incurred for additional capacity building such as training and information provision.

Medium costs are likely to be incurred for projects involving changes to insurance premia, electricity and water use (e.g. for cooling and ventilation) and changes to Joint Venture contracts.

Large scale capital and revenue investment will be needed in the long term to ensure that buildings, infrastructure and services are resilient to climate change. For example delivering adaptation responses through the Housing Market Renewal Initiative programme may be costly, as will building more resilient schools and buildings, and improving and maintaining the condition of highways and transportation infrastructure. But it is important to remember that increased flood resilience, passive ventilation and more resilient structures will produce substantial savings in the long term.

4.4 Beyond the Adaptation Action Plan

To meet the requirements of Level 4 of the former NI188 (implementation, monitoring and continuous review), Wiltshire Council will need to work with partners to develop a comprehensive adaptation action plan for the whole local authority area and also to develop effective monitoring and reporting systems

To date, key strategic partners and statutory agencies have been involved with only limited input in developing the Adaptation Framework and this Adaptation Action Plan. This Action Plan focuses on the council's work, and therefore a wider-reaching action plan is needed for the future which focuses on priorities agreed by all organisations on Wiltshire's Public Service Board. This work will start with an initial scoping exercise of responsibilities for the various organisations and public bodies in Wiltshire.

It is the intention to establish an adaptation action plan group to work through the same adaptation framework process that has been completed here to produce an adaptation action plan for the whole of Wiltshire. Wiltshire Council will also continue to develop relationships with neighbouring authorities, such as Gloucestershire and Swindon to develop closer co-ordination of climate change adaptation and mitigation activities.

5. Monitoring and Continuous Review

Regular and continual monitoring and reporting of progress is a requirement of the adopted adaptation framework and essential to effective delivery of adaptation responses. Monitoring and reporting procedures will need to be developed and agreed during 2011/12.

Monitoring of progress against the actions identified in the action plans will be an annual process carried out by the ECO team with the risk leads within each service area.

The Adaptation Action Plan exercise will be reviewed every 5 years in line with the national climate change risk assessment or when new climate change projections are released by the UK Climate Projections Programme. With this approach the council can ensure that the risk assessments will be based on the most accurate data for which it can develop the most appropriate responses.

DRAFT