

# Kingston upon Hull Climate change 2010-2020

**A low carbon framework for Hull**



## Forward

In 2001 the City Council produced the Local Agenda 21 Strategy for the city which set out how we would start to address sustainable development and ensure that the City could contribute to living within the environmental limits of the planet. Since this Strategy our understanding of the impact we are having on the planet has increased significantly and the key impact climate change has in this has become foremost. In the City Council signed the Nottingham Declaration on Climate Change committing itself as the largest employer in the City to take action on climate change. The Community Strategy for the City made a commitment to produce a Climate Change Strategy which was published in 2007. Following increased scientific understanding on future climate change, our impact on natural systems including natural resource depletion and developments in Government policy the Climate Change Strategy is being revised to provide a more holistic approach that addresses sustainable development and climate change. This Strategy takes account of this new knowledge of our impact on the planet and sets out the path the City will take to ensure that the cities development is sustainable and ensures a healthy and economically successful future.

Climate change is the single biggest threat to our ambitions for Hull expressed in the Community Strategy. Climate change, reducing natural resource availability over the next 100 years will fundamentally change the way we do business as a City and will affect every area of the City's life from what we teach our children in school, the environment that they play in, and the jobs and opportunities that they are able to pursue. In fact our whole quality of life will be affected by the impact of our changing climate.

We therefore need to work together, to build on our proud history, to ensure a successful future for the City by taking action today to reduce our impact on natural resources and the climate. This provides us with an opportunity to show how Hull can rise to this challenge and ensure that the City takes advantage of new economic opportunities that will arise as well as ensuring that the City is well adapted to the inevitable changes that will happen to the climate.

During 2007 we acknowledged how one of our own, William Wilberforce, through his belief and actions changed the way Britain and eventually the world thought about slavery. One person with a belief brought others together to take action that changed the world. Our fight against climate change is no less a challenge.

This Strategy requires all of us as residents, communities and businesses to understand how we are affecting the climate and then take action. It is not just a collective responsibility but also a personal responsibility. We hope you will join us in tackling climate change because tomorrow's climate is today's challenge.

Cllr Carl Minns  
Chair ONE HULL  
Leader Hull City Council

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## Executive Summary

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The threats to the natural environment and climate change are the biggest challenges we face as a City. Unsustainable use of natural resources and inbuilt climate change will have a significant impact on the City over the coming century. The key issue for Hull is what we do about these issues so that we can both protect the City and its residents and ensure that it is able to prosper.

This Strategy sets out how the City will take action on three Measures of Success covering mitigation and adaptation to climate change and the sustainable use of natural resources, these are arranged around five Priority Areas and fourteen Objectives. The Measures of Success set clear ambitions for the City so that Hull becomes a leader in carbon reduction action and environmental protection.

These measures are set against the background of the latest evidence on how our climate is changing. Increasing demand for natural resources through forestry, mining, oil extraction, farming and fishing are putting increased pressure on these ecosystems. Climate projections for Hull taken from the UK Climate Projections 2009 suggest that the annual temperature is likely to increase by between 1.4°C and 3.3°C by 2050 under a medium emissions scenario. We are likely to experience warmer wetter winters and hotter dryer summers but the probability of extreme weather events such as the floods of 2007 or prolonged periods of hot weather are likely to increase.

Based on the detailed evidence drawn from the UK Climate Projections we need to take action to reduce our carbon emissions and other greenhouse gases so that we can stop future climate change. Alongside this there is a need to ensure that the City has taken steps to adapt to the changing climate that are likely to happen during the coming century. Both of these issues provide the City with significant opportunities to improve the life of residents and enable inward investment and the development of the local economy

Our current use of natural resources is far outstripping that which is available on the planet. Although each resident in Hull, based on current consumption patterns, would need 5.02 global hectares for all their needs which is lower than the average for the country of 5.36 this would still mean that we would need three planets of resources for everyone in the world to live like us.

Linked to this is the increase in commodity prices as demand increases for natural resources as countries like China, India and Brazil develop. As competition increases for resources so does the price and thus the affordability of goods. This has most recently been felt through the increases in the wholesale gas prices which have increased significantly business and residents bills.

It is therefore important that the City uses resources efficiently and enables local business, organisation and residents to do the same to insulate the City from price fluctuations as well as to spur increased design and manufacturing innovation.

The Strategy sets out a clear direction for the City and through the Action Plan the steps that need to be taken by 2020 that will take the City significantly down the road to a sustainable and prosperous future.

## 1. Introduction

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The Environment & Climate Change Strategy has been produced by the Environment & Climate Change Standing Advisory Group (ECC SAG) of the ONE HULL Local Strategic Partnership (LSP) to develop city wide actions to tackle the threat of depleting natural resources and climate change. Climate change poses a significant risk to the City and it is agreed that city wide action must be taken if we are to successfully rise to the challenges ahead. The Strategy views the environment and climate change agenda within the context of sustainable development to achieve development that balances social, economic and environment issues.

There are not just negative impacts resulting from climate change but also opportunities arising from the switch to a low carbon economy, which the city of Hull is in a unique position to take advantage of. Renewable energy has been identified as a key growth cluster for the city demonstrating the opportunities within the green economy that will replace the current carbon economy.

### 1.1 The Aim of the Strategy

The Environment and Climate Change Strategy builds on the 2007 ONE HULL Climate Change Strategy and puts in place a strategically coordinated approach to tackling the environment and climate change agenda through a shared aim:

*“The City of Hull acknowledges that it has a responsibility to minimise its impact on the environment, reduce the causes of global climate change and adapt to future changes in the climate. These responsibilities it will tackle so that the City minimises the negative social, economic and environmental impacts whilst taking advantage of positive opportunities that arise from decoupling economic growth and carbon emissions.”*

The City understands that climate change is a global issue but acknowledges that it has ultimate responsibility for its own emissions which contribute to the global problem. The City has a community leadership role to champion actions to minimise carbon emissions and use natural resources sustainably through the delivery of effective citywide partnership actions.

In order to limit the impacts of climate change and the unsustainable use of resources, the ONE HULL ECC SAG is exploring opportunities where the biggest carbon savings and resource efficiencies can be made as part of its role in ONE HULL. It recognises that if the City is to be successful in meeting its ambitious targets then partnership working is vital not just within the City but also regionally, nationally and internationally. Every sector, large and small, can make a contribution to the challenge.

The Strategy is an overarching document that sits just below the Community Strategy and informs Strategy and investment decisions of the City as illustrated below:

## 1.2 How has the Strategy been developed?

Throughout the development of the Strategy, a wide range of partners have been consulted with. This includes partners from Hull City Council, Hull and East Yorkshire Hospitals, Hull Primary Care Trust, the Environment Agency, Hull Forward, Hull Business Forum, Humberside Police, the North Bank Forum, Amey plc, Government Office of Yorkshire and Humber (GOYH) and Local Government of Yorkshire and Humber (LGYH). Alongside this a Conference was held in October 2009 with representatives from the public, private and voluntary sectors to contribute to the development of the priority areas.

Following this the draft Strategy was produced which has been out for further consultation between and 10<sup>th</sup> May to 10<sup>th</sup> September 2010. During this period the Strategy has been available on the ONE HULL website and has been taken to the Strategic Delivery Partnerships of ONE HULL and the Area Committees of the City Council.

## 1.3 Measures of Success

The Environment and Climate Change Strategy for Hull is framed around three Measures of Success with five Priority Areas and fourteen Objectives. The Measures of Success have been established to ensure that there is long-term thinking at the heart of the City's growth that enables it to effectively respond to the challenges of climate change and depleting natural resources. The Priority Areas and Objectives (Section 5) provide further areas of focus for the development of action to meet the Measures of Success.

The Measures of Success have been established around three key issues:

- Carbon dioxide emission reduction (Mitigation)
- Adaptation to future climate change
- Sustainable use of natural resources

Our key performance targets for these Measures of Success are detailed below.

<b>Carbon Dioxide Emissions Reduction</b>	
<b>2011</b>	
	Establish Hull carbon emission reporting process
<b>2015</b>	
	Reduce carbon emissions by 23.6% to 30% from a 2005 baseline
<b>2020</b>	
	Reduce carbon emissions to between 34% to 45% from a 2005 baseline

<b>Adaptation</b>
<b>2011</b>
Produce Adaptation Risk Assessment Tool and identify key areas for assessment
Complete Sub-Regional Local Climate Impact Project
<b>2012</b>
Produce Adaptation Strategy and Action Plan for the City
<b>2014</b>
Adaptation embedded in working of ONE HULL

<b>Sustainable Use of Natural Resources</b>
<b>2012</b>
Hold Sustainable Procurement Conference to share best practice in the City
<b>2011-2020</b>
Hold inter-business events to link innovation, design and production businesses for manufacturing/ providing services with less resources
<b>2020</b>
Businesses and organisations adopted sustainable procurement processes

The carbon dioxide emissions targets have been taken from current national targets. However, the baseline has been taken from 2005 and not 1990 as detailed in the Climate Change Act 2008. This is because no data is available for Hull before 2005. However, comparing the national trend from 1990 to 2005, carbon emissions have decreased over that time. It seems reasonable to assume that carbon emissions for Hull will have also decreased between 1990 and 2005. Through setting targets identical to national targets but with a baseline from 2005, Hull's targets exceed national ones and the stretch target will position Hull as a national leader in carbon reduction.

Hull is one of the most at risk cities from flooding in the UK and it is vital that our actions adapt to the risks we face not just from flooding but also heat and air quality related risks. To ensure that we are effectively addressing adaptation to climate change as a City we will use National Indicator 188 which places the City Council and ONE HULL as the key bodies responsible for ensuring effective City response to adaptation.

There are also increasing pressures on natural resources as a result of increased expectations of residents and growth in the global economy. Our current standards of living are resource intensive and therefore we need to be able increase standards of living while using fewer natural resources. We therefore need to invest in more effective procurement processes in the City and support product innovation, design and production in the City to grow the economy and position the City for a world with reducing natural resources.

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## 2. Climate Change – The Strategic Context

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### 2.1 What is Climate Change?

The climate of Planet Earth has been in a constant state of change over millennia. The big global events such as the ice age are a result of changes in the climate over long periods of time triggered by a series of events that occur naturally that lead the world into and out of ice age periods.

This natural variation in the climate is a result of the complicated interactions between the oceans and atmosphere, the Earth's orbit, variations in the energy received from the sun and volcanic eruptions. Since the industrial revolution the human influence on these factors has increased significantly with the greatest impact being on the planet's atmosphere.

The atmosphere that surrounds the Earth is crucial to life it protects us from the cold of space and regulates the temperatures that we feel on the surface. Changes in the atmosphere can have dramatic effects upon surface temperature and weather patterns globally. The atmosphere ensures that at the earth's surface we have a mean temperature of around 15°C. This temperature is regulated by the gases in the atmosphere and the process known as the greenhouse effect. The atmosphere contains four main naturally occurring gases- water vapour, carbon dioxide, methane, nitrous oxide, and man made gases such as CFC's, HFC's etc. These gases regulate the effects of the sun (solar radiation) on the earth's temperature.

However, the rapid increase in the release of carbon dioxide through the burning of fossil fuels such as coal and oil into the atmosphere since the industrial revolution has upset this process and created what scientists have called an "enhanced greenhouse effect". Our increased use of fossil fuels is increasing the concentration of carbon dioxide, methane and nitrous oxide in the atmosphere and this is causing more of the sun's heat to be trapped inside our atmosphere and not escaping into space. This has had the effect of increasing global temperatures by as much as 0.6°C over the last century.

### 2.2 Why do we need to use natural resources more efficiently and adapt to and mitigate climate change?

It is widely agreed amongst the scientific and political communities that climate change is taking place and the latest report from the United Nations indicates that there is a 95% confidence that humans are causing this change. In terms of the use of natural resources if everyone in the world lived as we do in the UK then we would need three planets worth of resources. Climate change and the unsustainable way we currently use natural resources will and is affecting every single person on this planet in some way. Changes in temperature and precipitation will have a profound effect on the operational capability, development and prosperity of the City.

The floods of 2007 caused hundreds of millions of pounds worth of damage and stress for those that had to move out of their homes. Extreme weather events, such as the floods,

are predicted to happen more often over the next hundred years alongside other extreme events such as heat waves. The climate is predicted to sustain greater periods of high temperatures which may have significant impacts particularly on old and vulnerable people. The City needs to prepare itself better for these events by having plans in place to minimise their impacts.

Not only does the City need to adapt to the changing climate, it also needs to play its part in mitigating the causes of climate change by reducing carbon dioxide emissions. Climate change and unsustainable use of resources affects the most vulnerable in this country for example through higher fuel bills and in other countries through soil degradation affecting farming and the reduction in the availability of water. Hull recognises the inherent inequality of climate change. Those countries least able to respond to the challenges are the ones that suffer the most from it. We as a city contribute to the global emissions which affect these countries the most and we acknowledge that we have a duty and responsibility to minimise our contribution to the global problem.

While there are actions we need to take to use resources more efficiently and combat climate change these open up new opportunities in economic development and in the way we govern and create a more equitable society. This Strategy provides the basis upon which Hull can grab these new opportunities and ensure continued growth for the City and its current and future residents.

### **2.3 International Commitment**

Following the discovery of a hole in the ozone layer in the 1980s by the British Antarctic Survey there was increased research into how human development was affecting the global climate. This represented a shift away from research into the impact of humans on the availability of natural resources and the destruction of ecosystems.

This research led in 1992 to the first Earth Summit in Rio de Janeiro to look at sustainable development. This led to the signing of two key agreements. The United Nations Framework Convention on Climate Change (UNFCCC) as a response to human impact on the climate and the need to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous climate change. Alongside the Local Agenda 21 agreement this was a recognition that action on wider social, environmental and economic issues needed to be addressed at a local level.

The Local Agenda 21 programme became a key tool in addressing sustainable development and formed the basis for agreements on desertification, deforestation, environmental and trade accreditation schemes and biodiversity action plans.

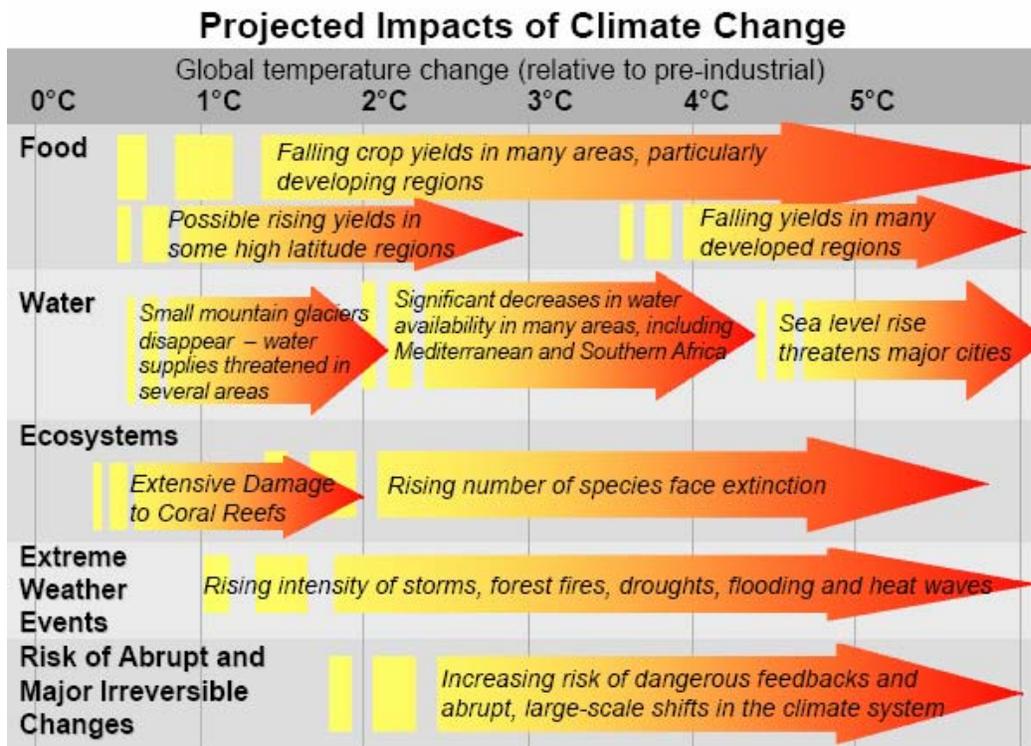
The UNFCCC led to the development of the Kyoto Protocol in 1997, which was adopted by 184 Parties. Under this treaty, 37 industrialised countries and the European Community committed to reducing their emissions by an average of 5% by 2012 against 1990 levels. Industrialised countries could take action domestically or abroad through market based mechanisms to meet their commitments.

In October 2006, the UK Government commissioned Nicholas Stern, a former economist at the World Bank, to examine the economic impact of climate change based on existing scientific evidence. The Stern Review sought to put financial costs to the impact of climate

change and the costs of mitigation. It concluded that whilst climate change is inevitable, there is still time to avoid the worst impacts if strong action is taken now. It stated that action today would only require 1% of global GDP each year. In contrast inaction now would cost as much as 20% global GDP in the future.

The Report identified the potential climate impacts resulting from temperature increases of between 1°C to 5°C summarised in the diagram below. Following this leading countries in the United Nations agreed to limiting global temperature increase to 2°C to reduce the worst effects of climate change.

**Figure 1: Stern Review Projected Impacts of Climate Change**



Source: Reproduced from the Stern Review – The Economics of Climate Change (2006)

While climate change became the key driver of international action it had at its heart the strong sustainable development thread. Effective delivery of mitigation and adaptation activity internationally addresses the joint social, environmental and economic impacts. The transition to a low carbon economy requires a new form of development that is sustainable and lives within the planets capacity.

The Kyoto Protocol was seen as the beginning of the process for addressing climate change and economic transition but recognised that it did not take account of the two fastest growing economies of China and India. In December 2009 countries met to discuss an ambitious and effective climate change deal which would supersede the Kyoto Protocol and redefine the global response as many developing countries had become industrialised including China, India and Brazil. Even though it did not establish an agreed timetable for a new legal treaty, the Copenhagen Accord, agreed by a group representing 49 developed and developing countries that together account for 80% of global emissions, agreed to limit global temperature increase to 20c and for all major economies to set domestic policy goals.

## 2.4 European Commitment

Sustainable Development Strategy of the European Union adopted in 2006 creates a long term vision for sustainability in which economic growth, social cohesion and environmental protection go hand in hand and are mutually supportive. The Strategy set a series of objectives which include action on climate change.

- Climate change and clean energy
- Sustainable transport
- Sustainable consumption and production
- Conservation and management of natural resources
- Public health
- Social inclusion, demography and migration
- Global poverty.

Flowing out of the Sustainable Development Strategy in 2000 it established the European Climate Change Programme (2000-2004) to create a clear focus for activity within Europe to meet the Kyoto Protocol targets. It set specific national targets as well as a target of an 8% reduction across the whole of the then 15 member states.

In October 2005 the second European Climate Change Programme (ECCP II) was agreed. This aims to continue to develop cost effective approaches to reducing greenhouse gases whilst increasing the economic prosperity of Europe. It has also established new working groups to consider some of the issues that have become more pressing over the life of the first programme:

- Carbon capture and geological storage (CCS);
- CO<sub>2</sub> emissions from light duty vehicles;
- Emissions from aviation;
- Adaptation to the effects of climate change.

In March, 2007 the EU endorsed a proposal to undertake a unilateral 20% reduction in emissions by 2020 from 1990 levels with a 20% increase in energy from renewable sources. Following the Copenhagen Summit the EU proposed a 30% reduction in emissions in the future if other major countries followed suit. In December 2008, the European Parliament and Council reached an agreement on the package that will help transform Europe into a low carbon economy and increase its energy security.

In December 2009, the EU Renewable Energy Directive requires the EU to increase the proportion of renewable energy from its current level of 8.5% to 20% by 2020. The UK target is 15% from 1.3% in 2005.

## 2.5 UK Commitment

The previous UK Government set out its aims and targets to address sustainable development and address climate change in 1999 and refreshed these in 2005 in the document "Securing the Future". This set four priority areas of sustainable production and consumption, climate change and energy, natural resource protection and environmental enhancement and sustainable communities.

Flowing out of this document has been the UK Climate Change Programme, published in 2000, and updated in 2006. However, in recent years the Government sought to enshrine its commitment in legislation and position the country as a world leader in carbon reduction.

In July 2007, the Government's "*Building a Greener Future: Policy Statement*" announced that all new publicly funded homes built from 2016 had to be zero carbon. This was followed up in the Budget 2008, with the ambition that all new domestic buildings should be zero carbon from 2019 with earlier targets for schools and other public buildings.

The Climate Change Act published in 2008 became the world's first long term legally binding domestic framework to tackle climate change. It set a target to reducing carbon dioxide emissions by 32% by 2020 and 80% by 2050 based on 1990 levels. Alongside this it published the Energy Act and Planning Act to create a focus on increasing energy security and the availability of renewable energy and amending the planning system to ensure that the commitments in the Energy Act could be realised through the Planning process.

In July 2009, the UK Government launched a suite of four plans which laid out the route map to achieve the 2020 targets for carbon reduction;

- UK Low Carbon Transition Plan.
- The UK Renewable Energy Strategy;
- The UK Low Carbon Industrial Strategy;
- UK Low Carbon Transport – A Greener Future

The UK Low Carbon Transition Plan is the overarching document containing five key themes;

1. Protecting the public from immediate risk;
2. Preparing for the future;
3. Limiting the severity of future climate change through a new international climate change agreement;
4. Building a low carbon UK;
5. Supporting individuals, communities and businesses to play their part.

It plots how the UK will meet a 34% cut in emissions by 2020 and establishes a vision for 2020 where:

- More than 1.2 million people will be in green jobs;
- 7 million homes will have benefited from whole house makeovers, and more than 1.5 million households will be supported to produce their own clean energy;
- Around 40% of electricity will be from low carbon sources;
- The average car will emit 40% less carbon than now;
- Smart meters in every home.

A key element of the Low Carbon Transition Plan in achieving the 34% reduction by 2020 was the launch in April 2010 of the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), a mandatory carbon trading scheme for business and organisations consuming over 6,000 MWh per year (equal to about £500,000 per annum).

The new Coalition Government has endorsed the Climate Change Act and the implementation of the CRC. It has also made a commitment to establish the current Government as the greenest with a renewed emphasis on delivering a low carbon future.

## **2.6 Regional and Sub-Regional Context**

Following the General Election Local Government Yorkshire and Humber and Yorkshire Forward established the Yorkshire and Humber Independent Sustainability Board to take forward the sustainable development agenda in the region. The Chair of this Board is also Chair of the regional Climate Change Board as this is a key element of the sustainable development agenda.

The new Board is responsible for the Regional Sustainable Development Strategy and the Climate Change Plan for Yorkshire and the Humber. The Boards also oversee the Regional Efficiency and Improvement Programme and the Regional Climate Change Officers Group.

In April 2009, officers from the four Local Authorities of the Humber sub-region set up the Humber Climate Change Partnership. The Partnership is working together to address adaptation and mitigation and identify potential opportunities or synergies in the work that each authority undertakes.

## **2.7 Climate Change Policy in Hull**

The City recognised the importance of climate change within the wider concept of sustainable development in the Sustainable Community Strategy of ONE HULL produced in 2006. This built upon the programme developed as part of the Council's Local Agenda 21 Strategy in 2000. The Sustainable Community Strategy committed the City to producing a Climate Change Strategy which was published in 2008.

While these documents relate to the wider sustainable development and climate change agenda the City Council and the City has embedded the need to address these through its other key documents as shown in Appendix C.

## 3. Projected Change in Climate for Hull

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### 3.1 The United Kingdom Climate Projections 2009

In June 2009, the United Kingdom Climate Projections 2009 (UKCP09) were published and attempted to predict the level of future climate change based on the past climatic period 1961-1990. This is the fifth generation of climate information for the UK, and is the most comprehensive package produced to date. For the first time it provides probabilistic values of climate change based on quantification of the known sources of uncertainty and does this over a series of emissions scenarios; low, medium and high.

### 3.2 What do the emission scenarios mean?

In 2000, the Intergovernmental Panel for Climate Change (IPCC) in their Special Report on Emissions Scenarios (SRES), developed a series of 40 greenhouse gas and aerosol emission scenarios.

The amount of greenhouse gasses emitted into the atmosphere over the next few decades could follow a number of pathways, depending on global mitigation efforts. The emissions scenarios provided in UKCP09 give three possible future pathways, low, medium and high, for emissions that do not include planned mitigation measures, though they do include technological and economic change. The three scenarios, low, medium and high emissions, predict an average increase in temperature of 2°C, 3.2°C and 4°C respectively. However, while the Projections contain these three separate scenarios it is expected that they are considered together.

Therefore under the UKCP09 the three scenarios predict the following broad changes for Hull by 2080;

#### **Low emissions scenario (+2°C)**

- Annual temperature is very unlikely to increase by less than 1.6°C and more than 3.8°C with a 50% chance of a 2.0°C increase;
- Summer temperature is very unlikely to increase by less than 1.2°C and more than 4.3°C with a 50% chance of a 2.5°C increase;
- Winter temperature is very unlikely to increase by less than 1.4°C and more than 3.8°C with a 50% chance of a 2.5°C increase;
- Annual precipitation is very unlikely to decrease by more than 3.4% and increase by more than 7.1% with a 50% chance of a 1.7% increase;
- Summer precipitation is very unlikely to decrease by more than 29.9% and increase more than 9.1% with a 50% chance of a 11% decrease;
- Winter precipitation is very unlikely to increase by less than 3.1% and more than 33.5% with a 50% chance of a 15.6% increase.

#### **Medium emissions scenario (+3.2°C)**

- Annual temperature is very unlikely to increase by less than 2.0°C and more than 4.6°C with a 50% chance of a 3.2°C increase;

- Summer temperature is very unlikely to increase by less than 1.7°C and more than 5.4°C with a 50% chance of a 3.3°C increase;
- Winter temperature is very unlikely to increase by less than 1.6°C and more than 4.5°C with a 50% chance of a 2.9°C increase;
- Annual precipitation is very unlikely to decrease by more than 5.2% and increase by more than 6.7% with a 50% chance of a 0.5% increase;
- Summer precipitation is very unlikely to decrease by more than 38% and increase more than 5.1% with a 50% chance of a 17.4% decrease;
- Winter precipitation is very unlikely to increase by less than 3.1% and more than 42.1% with a 50% chance of a 19.2% increase.

#### **High emissions scenario (+4°C)**

- Annual temperature is very unlikely to increase by less than 2.6°C and more than 5.7°C with a 50% chance of a 4.0°C increase;
- Summer temperature is very unlikely to increase by less than 2.2°C and more than 6.7°C with a 50% chance of a 4.0°C increase;
- Winter temperature is very unlikely to increase by less than 1.9°C and more than 5.5°C with a 50% chance of a 3.6°C increase;
- Annual precipitation is very unlikely to decrease by more than 6.9% and increase by more than 9.5% with a 50% chance of a 0.7% increase;
- Summer precipitation is very unlikely to decrease by more than 45.1% and increase more than 4.2% with a 50% chance of a 21.6% decrease;
- Winter precipitation is very unlikely to increase by less than 6.3% and more than 56% with a 50% chance of a 25.4% increase.

### **3.3 Which scenario does the Strategy follow?**

The medium emissions scenario is used for predicting future climate for this Strategy, as this scenario is the most likely to occur based on the current global course of action taken. A medium emissions scenario assumes:

- Global population peaks at almost 9 billion before falling to around 7 billion by 2100;
- The global economy grows during the 21<sup>st</sup> Century at a similar rate (2.9% per year) as experienced during the 20<sup>th</sup> Century (2.7% per year). Some reductions in income equalities are achieved as a by-product of economic growth;
- Total global energy demand continues to grow and is around six times greater in 2100 than 1990;
- There is a balanced emphasis on all energy sources.

Having said this global agreements and the UK Climate Change Act are focused on delivering the low emissions scenario but current progress globally makes the medium scenario more likely.

### 3.4 Hull's Projected Climate Change

Following the medium scenario and the data from the UKCP09 we have been able to establish a series of more detailed climate projections for Hull up to 2099.

### 3.5 Hull's Projected Climate 2020

#### Key Findings:

- The mean **annual temperature** is very unlikely to increase less than 0.7°C and is very unlikely to increase more than 2.0°C. There is a 50% chance that the temperature will increase by 1.3°C.
- It is very unlikely that the mean **summer precipitation** will decrease more than 19.7% and increase more than 10.5%. There is a 50% chance that summer precipitation will decrease by 5.2%.
- It is very unlikely that the mean **winter precipitation** will decrease more than 3.6% and increase more than 16.4%. There is a 50% chance that winter precipitation will increase by 5.6%.
- It is very unlikely that the temperature change of the **warmest day** will be decrease more than 2°C and is very unlikely that it will increase by more than 4.2°C. There is a 50% chance that the temperature of the warmest day will increase by 1°C.
- It is very unlikely that precipitation on the **wettest day** will decrease more than 5.7% and increase by more than 17%. There is a 50% chance that the precipitation on the wettest day will increase by 5%.

### 3.6 Hull's Projected Climate 2050

#### Key Findings:

- The mean **annual temperature** is very unlikely increase less than 1.4°C and is very unlikely to increase more than 3.3°C. There is a 50% chance that the temperature will increase by 2.3°C.
- It is very unlikely that the mean **summer precipitation** will decrease more than 31.4% and very unlikely it will increase more than 5.3%. There is a 50% chance that summer precipitation will decrease by 13.9%.
- It is very unlikely that the mean **winter precipitation** will increase less than 1.8% and very unlikely it will increase more than 30.3%. There is a 50% chance that winter precipitation will increase by 13.9%.
- It is very unlikely that the temperature change of the **warmest day** will decrease more than 1.5°C and is very unlikely that it will increase by more than 4°C. There is a 50% chance that the temperature of the warmest day will increase by 2.1°C.

- It is very unlikely that precipitation on the **wettest day** will decrease more than 0.1% and very unlikely it will increase by more than 28%. There is a 50% chance that the precipitation on the wettest day will increase by 12.2%.

### 3.7 Hull's Projected Climate 2080

#### Key Findings

- The mean **annual temperature** is very unlikely to increase less than 2°C and is very unlikely to increase more than 4.6°C. There is a 50% chance that the temperature will increase by 3.2°C.
- It is very unlikely that the mean **summer precipitation** will decrease less than 38% and very unlikely it will increase more than 5.1%. There is a 50% chance that summer precipitation will decrease by 17.4%.
- It is very unlikely that the mean **winter precipitation** will increase less than 3.1% and very unlikely it will increase more than 42.1%. There is a 50% chance that winter precipitation will increase by 19.2%.
- It is very unlikely that the temperature change of the **warmest day** will increase less than 0.6°C and is very unlikely that it will increase by more than 5.5°C. There is a 50% chance that the temperature of the warmest day will increase by 2.8°C.
- It is very unlikely that precipitation on the **wettest day** will increase less than 2.7% and very unlikely it will increase by more than 36.5%. There is a 50% chance that the precipitation on the wettest day will increase by 17.6%.

The predictions understandably become more uncertain the further into the future we are forecasting and the ranges become wider. This does make planning for future change difficult for policymakers, residents and businesses. However, the weather in Cumbria from October 2009 to July 2010 shows that such ranges are not without evidence. In the later part of 2009 Cumbria experienced heavy rainfalls resulting in flooding and damage to bridges that cut off some towns. However, between January and June 2010 the country as a whole including Cumbria experienced the driest period since 1926 resulting in parts of the canal system in the North West being shut down, hosepipe bans and the lakes in the Lake District being significantly lower than would be expected.

### 3.8 The Implications of Future Climate Change on Hull

The information contained in the future climate projections above show that Hull will experience changes in its climate. The City therefore needs to identify what these likely impacts will be so we can anticipate changes and adapt to them minimising the negative outcomes for the City. These impacts fall into two areas that of extreme weather events such as the floods in 2007 and the heat wave in 2003 and incremental change brought about as we move towards warmer wetter winters and hotter dryer summers which will see changes in plant and animal habitats and the demands for services and goods. These local changes are set within global environmental, social and economic changes linked to climate change that will see natural resource depletion and increased population movement.

### **3.9 General Impacts of Increased Temperatures**

Increases in annual mean temperature in particular summer mean temperature will have a significant impact on Hull. Thermal comfort in offices will be compromised particularly in old buildings as a result of increased temperatures leading to decreased productivity and an increase in heat-related illness. Building design will have to consider increased temperatures in their specification. It is likely that there will be an increase in demand for cooling systems to operate alongside heating systems which will increase energy costs and carbon emissions. Therefore, there is a significant challenge for architects to design new buildings which are as heat efficient as possible and promote natural air ventilation as well as retrofit solutions.

An increase in temperatures may result in greater levels of sunburn and heat stress as witnessed in the summer heat wave of 2003 in Europe which caused 20,000 deaths. This will put increased pressure on health services, care home providers and office and factory workers. Higher temperatures will also lead to more cases of food related illness and spread of diseases. A warmer climate will also encourage the survival rates of pests, the migration north of flora and fauna and loss of existing habitats.

Hotter days during the summer could cause disruption, particularly during sustained periods of high temperatures. In extreme conditions, roads can begin to degrade and rail tracks can begin to buckle which would cause significant disruption to the city especially as it has several bottlenecks on the highways and rail infrastructure where demand for capacity is high, particularly for industrial transport.

However, we must recognise that there are opportunities which the City could exploit. An increase in temperatures could aid the development of tourism in the city, new product development and opportunities for building retrofit and renewable energy.

### **3.10 General Impacts of Increased Precipitation**

The increased level of precipitation during winter, decreased levels during summer and increase in the frequency and intensity of precipitation events are likely going to put additional pressure on Hull's drainage system, flood defences, watercourses and ground conditions.

The intense weather event and conditions which caused the flooding in Hull in 2007 are likely to occur more frequently meaning that the existing flood defences and drainage system will be at risk more often. The City must examine new measures to alleviate pressures on current defences and adaptations such as ongoing work on developing an aqua green in the east of the City. In addition, organisations can be encouraged to install rainwater systems which retain water locally and reduce the flow of surface water run off within the Hull and Humber river basins as well as reduce demand for water.

As precipitation in the summer is predicted to decrease, this will lead to increased risk of water shortages and residents and businesses will need to increase water efficiency. Alongside this low river levels will lead to issues with water quality with implications for the natural environment in terms of biodiversity along the River Hull and River Humber. Reduced precipitation alongside increased heat will affect the rural hinterlands of Hull as

growing seasons will fluctuate and soil degradation may occur leading to wider food security challenges.

Water issues are not limited locally and work is being undertaken with the Environment Agency to look at river basin activity which requires authorities to work together over significant geographical areas.

At the heart of both increased temperatures and variations in precipitation is the need to use natural resources more efficiently. These natural changes are likely to result in increased costs for these resources for the consumer which will hit the most vulnerable members of our City disproportionately as well as business that are energy and water intensive. How we adapt to these changes will be critical to the future success of the City.

### 3.11 Potential Impacts of Climate Change on Hull

Hull’s projected climate change can be summarised as wetter milder winters and drier hotter summers with a steady increase in mean annual temperature. Figure 2 identifies some of the potential impacts, both positive and negative, for the city of Hull which also provides the basis for thinking on adaptation and the integration of sustainable development in long term growth for a low carbon economy.

**Figure 2: Potential Issues for Hull**

<b>Health and Wellbeing</b>
<ul style="list-style-type: none"> <li>▪ Increase in cases of heat-related illnesses and deaths during summer;</li> <li>▪ Heat stress to the old, poor, young and vulnerable communities and people likely to increase;</li> <li>▪ Increase in cases of sun exposure related illnesses and deaths;</li> <li>▪ Increase in cases of illness resulting from poor air quality;</li> <li>▪ Increase risk of injuries and deaths due to greater incidences of extreme weather events and flooding;</li> <li>▪ Increase in cases of pathogen related diseases;</li> <li>▪ Increase in cases of food poisoning.</li> <li>▪ Increased temperatures may result in increased participation in leisure activities in parks and public spaces resulting in improved health, lower obesity and improved quality of life.</li> </ul>
<b>Flood Risk</b>
<ul style="list-style-type: none"> <li>▪ Greater risk from greater tidal, pluvial and fluvial flooding throughout the city;</li> <li>▪ Increase of flood risk will lead to a change in insurance provisions for flood damage;</li> <li>▪ Capacity of waste water treatment plants and sewers may need increasing;</li> <li>▪ Flood defences may need to be upgraded to cope with new parameters;</li> <li>▪ New development may need to be restricted or climate proofed.</li> </ul>
<b>Biodiversity</b>
<ul style="list-style-type: none"> <li>▪ Temperature increases could result in migration of species or even loss of habitats;</li> <li>▪ Reduction of summer precipitation could have an impact on flora growth and diversity.</li> </ul>
<b>Housing and Buildings</b>
<ul style="list-style-type: none"> <li>▪ Increased drought and flood risk will result in poor soil quality which will lead to</li> </ul>

<p>erosion and subsidence;</p> <ul style="list-style-type: none"> <li>▪ Wetter winters increase issues of damp in buildings and housing;</li> <li>▪ Increase in the demand for air conditioning which results in an increase of carbon dioxide emissions.</li> <li>▪ Issue of cost of retrofitting existing housing</li> <li>▪ Disruption in learning if education buildings not adapted to changes</li> </ul>
<p><b>Industry and Commerce</b></p> <ul style="list-style-type: none"> <li>▪ Deterioration of working conditions due to increased temperatures;</li> <li>▪ Limitation on the use of water for chemical and food and drinks industry;</li> <li>▪ Environmental health issues associated with food leading to increased costs and emissions to maintain food standards due to increased temperatures;</li> <li>▪ Increased risk from climate related issues leading to higher cost premiums for business such as energy costs and threats to premises from flooding which may in turn increase financial costs and risk;</li> <li>▪ Growth of the renewable energy sector will provide employment opportunities in Hull;</li> <li>▪ Challenge for businesses to decouple carbon emissions from economic growth and use natural resources more sustainably;</li> <li>▪ Higher temperatures encourage an increase in tourism to the City.</li> </ul>
<p><b>Transport and Highways</b></p> <ul style="list-style-type: none"> <li>▪ Risk of rail tracks buckling due to increased temperatures;</li> <li>▪ Road surface melting more frequently;</li> <li>▪ Flooding of roads and railways;</li> <li>▪ Increased rainfall intensity affecting embankments and washing more debris into gullies leading to blockages and increased flood risk;</li> <li>▪ Higher temperatures may increase the likelihood of road surface damage and subsidence.</li> </ul>
<p><b>Environmental Services</b></p> <ul style="list-style-type: none"> <li>▪ Loss of trees, shrubs and plant life due to drier summers and wetter winters;</li> <li>▪ Waste will decay more rapidly in higher summer temperatures which may require more frequent waste collections;</li> <li>▪ Higher summer temperatures and higher more intense precipitation may affect landfill design and operation;</li> <li>▪ Climate change will have an effect on our green space conditions and natural corridors.</li> </ul>
<p><b>Awareness</b></p> <ul style="list-style-type: none"> <li>▪ Increased flood risk and higher sustained temperatures will mean that our communities need to be better prepared and aware of emergency response arrangements;</li> <li>▪ A change in climate means we need to lead and inform our communities of the actions they can take to minimise their impact and how they can adapt;</li> <li>▪ Climate change provides an opportunity for the city to learn about environmental issues and exploit the learning opportunities which could facilitate the transition to a low carbon economy and economic development;</li> <li>▪ Learning about the impacts of climate change could improve the quality of life and address sustainability issues from a young age;</li> <li>▪ Migration as a result of climate change will increase the diversity of the city.</li> <li>▪ The likelihood of anti-social behaviour in public spaces may increase as a result of population pressures and tensions within communities.</li> </ul>

Source: Adapted from "Climate Change and Local Communities – How Prepared Are You?" (2003)

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## 4. The Ecological and Carbon Footprints of Hull

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### 4.1 Introduction

In measuring sustainable development the use of ecological footprinting provides the best tool. This measures the amount of land in global hectares (gha) that are used to achieve our standard of living taking into account the area of land needed to feed, provide resources, produce energy and soak up pollution generated and associated with the goods and services that we consume. In January 2008, a study was undertaken by URSUS Consulting Ltd for ONE HULL to provide an ecological and carbon footprinting analysis for Hull as at 2000 as well as examining how the carbon footprint is likely to change by 2026. A carbon footprint identifies the amount of carbon consumed by a particular lifestyle using the same measures as for ecological footprinting.

The URSUS Study uses the concept of “One Planet Living” which says that we should have a standard of living that can be sustained with the resources available on the Earth. The UK is currently consuming resources that mean that if everyone on the Earth lived like us we would need three planets worth of resources.

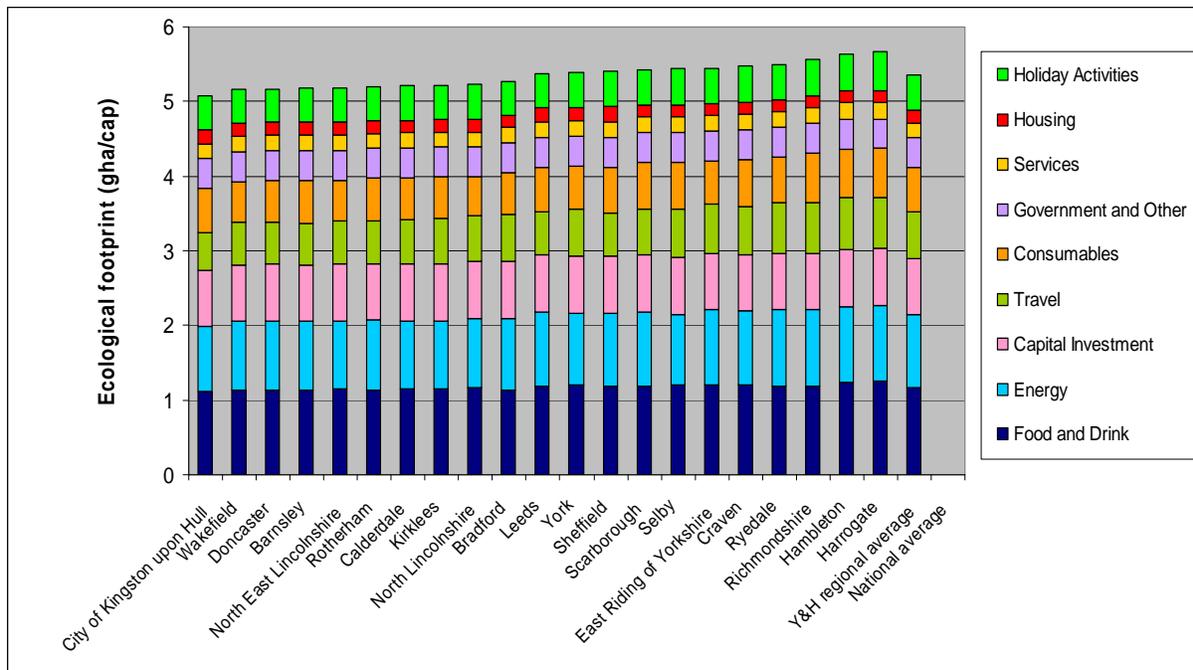
The Study shows that there is a strong link between levels of income and the size of the footprint. Therefore the de-coupling of economic growth and increasing use of resources to achieve prosperity is fundamental and is at the heart of sustainable development and the move towards a low carbon future.

### 4.2 Hull’s Ecological and Carbon Footprint in 2008

#### Ecological Footprint

Hull’s ecological footprint in 2000 was 5.02gha per capita. This compares with the UK average of 5.36gha per capita and the Yorkshire and Humber average of 5.3gha per capita. Figure 3 below shows that Hull has the lowest ecological footprint of all districts in the region, reflecting levels of prosperity and household income with 60% of Hull’s ecological footprint accounted for by housing, energy, travel and food and drink consumption.

**Figure 3 – Ecological Footprints by District in Yorkshire and the Humber**



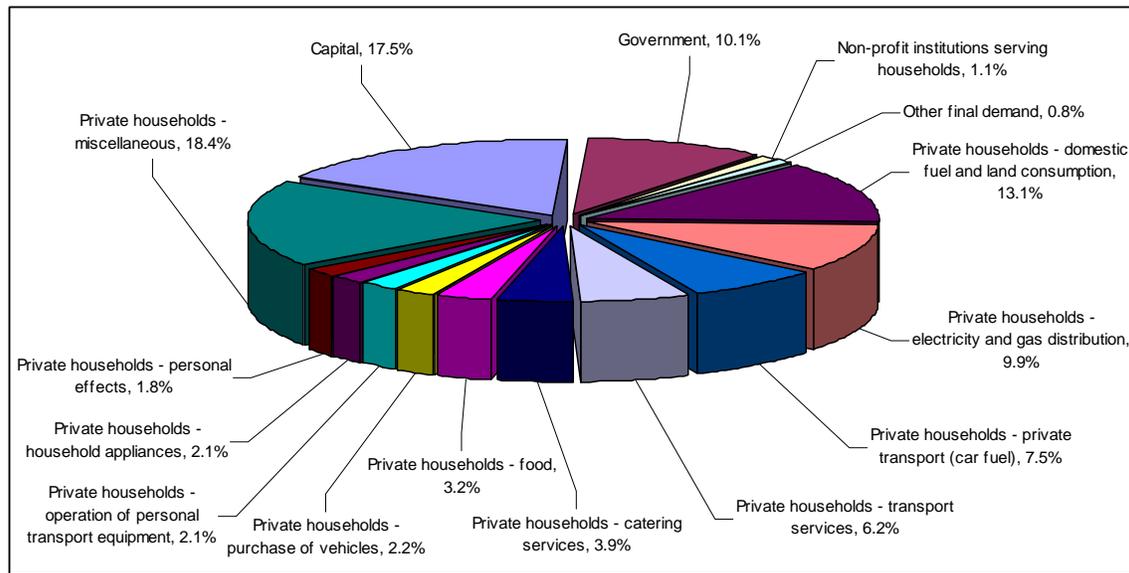
Source: URSUS Carbon Footprint Report for Hull 2008

**Carbon Footprint**

Hull’s carbon footprint based on carbon emissions in 2000 of 2,629,618 (2,629 kilotonnes-kw) is 10.74 tonnes per capita, compared to a UK average of 11.8 tonnes per capita. Figure 4 shows that when broken down by end user, 70.5% of total carbon dioxide emissions are accounted for by private households. The household consumption activities which result in the greatest carbon dioxide emissions include domestic fuel and land consumption (13.1%), electricity and gas distribution (9.9%), car fuel (7.5%) and transport services (6.2%). This highlights the need to target domestic households around fuel efficiency and transport.

Analysis of Hull’s carbon footprint highlights that Government makes a significant contribution to carbon emissions with 10.1%. This is likely to be higher if we include partners within ONE HULL. This means there is an opportunity for partners to make a significant contribution to the reduction of city wide carbon dioxide emissions through reducing their own emissions.

**Figure 4 – Breakdown of Hull’s Carbon Footprint by Consumption Activity**



Source: URSUS Carbon Footprint Report for Hull 2008

### 4.3 Hull’s Future Carbon Footprint

However, since the URSUS Study, measurements of the contribution of sectors to carbon dioxide have moved on. The scenario element of the study which looked at the impact of policy changes around transport use, house improvements (retrofitting), new build and energy mix have been overtaken by more up to date data. The use of effective carbon modelling though and the impact of policy actions to forecasting future carbon reduction are crucial to the City planning a route to a low carbon future.

To achieve effective modelling the City is part of a region wide study into different carbon modelling software that will support future policy development. However, the data published for National Indicator 186 in September 2010. Figure 5 shows that there has been a reduction of 9.1% in total carbon dioxide emissions over 2005-2008. Taking into account population figures there has been a reduction per capita of 10.8% over the period.

**Figure 5 – National Indicator 186**

Year	Emissions Actual (National Indicator 186 in kilo tonnes)	Carbon Dioxide Reduction/ increase from 2005 baseline (%)	Carbon Dioxide per capita emissions (%)
2005	1909	0	7.4
2006	1842	-3.5%	7.1
2007	1768	-7.3%	6.8
2008	1734	-9.1%	6.6

Source: DEFRA

## 5. The Way Forward – Hull’s Commitment

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This part of the Strategy outlines in more detail the strategic direction for the City in its response to the challenge of climate change and depleted levels of natural resources. It provides the framework for what the City identifies as its Measures of Success and key Priority Areas which will contribute to the achievement of the Strategy.

### 5.1 Measures for Success

#### 5.1.1 Carbon Dioxide Emission Reduction (Mitigation)

**Reduce carbon dioxide emissions from all activity in the City by 34% over the 2005-2020 period with an ambition to reduce emissions by 45% over the same period.**

The carbon reduction target of a 34% reduction by 2020 will enable the City to meet the ambitions set out in the Climate Change Act and provide the reduction trajectory to reduce emissions by 80% by 2050. However, the Strategy has an ambition to reduce emissions at a faster rate than set out in the Climate Change Act. The 45% target has been derived from the average percentage of carbon emissions reduction that the City has been achieving over 2005-2008. This tougher target also would have a significant effect in terms of reducing the total cumulative emissions over the period of this Strategy compared to the 34% target. The annual target figures in Appendix I shows that by achieving the 34% target we will save 650 kilotonnes (kt) of carbon dioxide but the 45% target would save an additional 206kt (856kt).

Therefore the Cities baseline target is to achieve a 34% reduction but with an ambition to meet the 45% target.

Tables 6 and 7 show the carbon reduction trajectory figures for the City. The figures in blue have been produced by DEFRA and are actual figures for the City. As can be seen the figures produced by DEFRA take two years to be compiled. The lines in green are interim targets so that the City can gauge its progress with the purple line being the end targets for 2020.

**Table 6 – Hull’s Carbon Dioxide Reduction targets (34% reduction by 2020)**

Year	Annual Reduction Target (%)	Rolling Year Reduction from 2005 (%)	CO2 Annual Target (kt)	Cumulative CO2 Reduction (kt)
2005	0	0	1909	0
2006	3.5	3.5	1842	67
2007	3.8	7.3	1768	141
2008	1.8	9.1	1734	175
2009	2.07	11.17	1694.5	214.5
2010	2.07	13.24	1655	254
2011	2.07	15.31	1615.5	293.5
2012	2.07	17.38	1576	333
2013	2.07	19.45	1536.5	372.5
2014	2.07	21.52	1497	412
2015	2.08	23.6	1457.3	451.7
2016	2.08	25.68	1417.6	491.4
2017	2.08	27.76	1377.9	531.1
2018	2.08	29.84	1338.2	570.8
2019	2.08	31.92	1298.5	610.5
2020	2.08	34	1260	650.2

Source: DEFRA and Hull City Council

**Table 7 - Hull’s Carbon Dioxide Reduction targets (45% reduction by 2020)**

Year	Annual Reduction Target (%)	Rolling Year Reduction from 2005 (%)	CO2 Annual Target (kt)	Cumulative CO2 Reduction (kt)
2005	0	0	1909	0
2006	3.5	3.5	1842	67
2007	3.8	7.3	1768	141
2008	1.8	9.1	1734	175
2009	2.9	12	1679	229
2010	3	15	1622	286
2011	3	18	1565	343
2012	3	21	1508	400
2013	3	24	1450	457
2014	3	27	1393	514
2015	3	30	1336	571
2016	3	33	1279	628
2017	3	36	1221	685
2018	3	39	1164	742
2019	3	42	1107	799
2020	3	45	1049	856

Source: DEFRA and Hull City Council

We have not produced annual carbon reduction targets to deliver the Climate Change target of an 80% reduction by 2050. The level of carbon reduction needed to 2050 will be calculated following the end of this Strategy when the progress that has been made can be assessed.

#### Monitoring

Progress will be measured through two methods. The first will use the figures produced by DEFRA under national Indicator 186 which are contained in the Tables above for 2005-2008. While the future of the Indicator is not certain it is assumed that these will continue to be produced as part of the Governments monitoring under the commitments in the Climate Change Act.

As has been stated these figures have a two year lag in their production. Therefore, a more timely monitoring method will be used. All of the larger carbon dioxide emitters in the City will be required to make declarations of their carbon emissions under the European Union Energy Trading Scheme (EUETS) or CRC Energy Efficiency Scheme (CRC).

Therefore as part of the first year of the Strategy a process will be developed where organisations covered by these schemes provide their emissions data to ONE HULL and a total figure for the City is published baselined for the year 2009-2010. This will enable the City on an annual basis to get an indication of its emission trajectory. While this process will initially focus on EUETS and CRC reporting organisations other organisations will be encouraged to join the reporting process.

### **5.1.2 Adaptation to future climate change**

**The City of Hull is prepared for the effects of climate change, through an effective and embedded approach to climate adaptation.**

It is important that the City is prepared for the potential impacts of climate change. If the City does not anticipate and prepare for changes in climate and the increased likelihood of extreme weather events then the quality of people's lives will suffer and the cost of service provision will increase. As the Stern Review indicated preparation for changes will be significantly cheaper than responding as they occur. Therefore the City will develop a risk based assessment of the impacts of climate change to services and business sectors so that long term investment decisions can be informed by expected impacts.

#### Monitoring

Progress against this Measure of Success will be undertaken using the National Indicator 188 Adaptation to Climate Change Matrix. This document provides a self assessment of the cities preparedness for future climate change at four levels. Although the future of the national Indicators are currently under review the Matrix is a good tool for assessing the cities progress.

### 5.1.3 Sustainable Use of Natural Resources

**The City of Hull uses physical and natural resources sustainably, efficiently and effectively.**

There are increasing pressures on natural resources as a result of increased expectations of residents and growth in the global economy. Therefore, it is essential that the way we adopt a sustainable approach to development so that the use of natural resources is efficient and reduces the unnecessary use of resources and minimises waste and pollution. The effective use of natural resources can be best delivered through effective procurement decisions and ensuring that resources used both reduce carbon dioxide emissions and damage to the planet as well as adapting to a world that will have changed as a result of climate change and where resources will become scarcer and be more expensive.

The move to sustainable development and effective resources use are integral elements of developing Hull as a low carbon economy. The Strategy wishes to see all organisations include a risk based assessment to the use of natural resources to both extend the availability of finite resource as well as increase businesses and residents security from reduced availability and fluctuations in commodity prices.

#### Monitoring

The progress against this measure will be monitored through specific pieces of work in the Action Plan and through ensuring that actions to achieve the other Measures of Success ensure the sustainable use of natural resources and sustainable development.

## 5.2 Key Priority Areas and Objectives

The Key Priority Areas and Objectives were developed initially through a review of existing policies and strategies. These were then presented to a City Conference in October 2009 to ensure that we had captured the right issues and provided the correct level of focus to assist in the development of future actions by ONE HULL in the action plan. The Key Priority Areas and Objectives are:

### 5.2.1 Energy Security and Efficiency

**Objective 1:** Increase the proportion of renewable and low carbon energy used and produced in the City.

**Objective 2:** Promote and improve energy efficiency in all existing and new buildings both domestically and commercially targeting the least efficient buildings and people suffering from fuel poverty.

### 5.2.2 Community Engagement

**Objective 3:** Promote and raise awareness of the impacts of climate change and encourage and empower organisations, schools and individuals to take an active role in adaptation, mitigation and sustainable resource use.

**Objective 4:** Promote and raise awareness of the support available for homes and businesses.

### **5.2.3 Economic Development**

**Objective 5:** Increase the number of 'green collar' training and employment opportunities in Hull.

**Objective 6:** Develop low carbon industries with renewable energy as a key growth cluster for the city.

**Objective 7:** Develop sustainable procurement frameworks, networks and practices in the city.

**Objective 8:** Sustainability is at the heart of all major physical development within the City, with climate change issues forming an integral part of the appraisal process.

### **5.2.4 Resource Management**

**Objective 9:** Use the natural environment as a mechanism for adapting to and mitigating climate change.

**Objective 10:** Develop, protect and enhance green corridors and spaces, biodiversity and habitats in the green and marine environments.

**Objective 11:** Improve waste efficiency in the city by following the waste hierarchy of first reducing, then reuse and finally recycling.

### **5.2.5 Quality of Life**

**Objective 12:** Produce plans and action that reduce the impact of flooding and heat waves particularly during extreme weather events, including actions such as water management and emergency response arrangements.

**Objective 13:** Reduce carbon emissions from transport and improve health and social outcomes through the promotion of public transport, cycling, walking and alternative fuels and technologies.

**Objective 14:** Improve health opportunities so that preventable illness can be avoided and the City and individuals are better able to respond to the impacts of climate change.

### **5.3 Conclusion**

It is imperative that as a city we prepare for the expected impacts of climate change as a result of carbon dioxide already emitted. It is evident that the City has experienced more frequent extreme weather events as a result of a climate change and this is expected to increase in regularity. We not only have to adapt to our current and future climate, but also minimise future climate change and learn to be more resource efficient.

This Strategy clearly sets out the case and context of climate change and natural resource efficiency and how, over this Century, it will have a significant impact on how the City of Hull develops. Climate Change will affect the economic growth of the City and provide opportunities for new inward investment. It will shape how public service providers deliver their services to meet the challenges that lie ahead.

Climate Change is one issue that will impact every single person in some way. There is not only a collective responsibility for the leading organisations to act as community leaders and act responsibly, we all have a personal responsibility to take action to minimise our impact. We will all have to adjust to a new climate in the future and it is how we are prepared for this new climate that will affect our resilience to cope with these changes.

The key Measure of Success and Priority Areas which have been outlined in this Strategy will be underpinned by a detailed and coordinated action plan will start to put Hull in the position it needs to be to minimise the negative impacts and exploit new opportunities. There will be increasing expectations on us as a City to rise to the challenges ahead and this document sets out the course of action that we will take up to 2020 and the vision up to 2050.

As Lord Stern said in his 2007 report on the economics of climate change, "It is the companies and organisations who respond now to challenge of climate change, which innovate and find new solutions to new challenges that will succeed in the long term".

**ONE HULL Climate Change Strategy 2010-2020 Action Plan**

The Action Plan will be monitored and reviewed annually to establish progress and to capture additional work to achieve the three Measures of Success.

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
1	All	Develop ONE HULL Report templates to include commentary on climate change	Embedding of climate change issues within the decision making structure of ONE HULL	ONE HULL	March 2011	Existing resources
2	All	Integrate work to address the Measure of Success into the Service Delivery Partnerships work programmes	Mainstreaming of climate change/ sustainability work in the achievement of the four ONE HULL priorities of Earning, Learning, Healthy and Safe.	ONE HULL	March 2011	Existing resources
3	3,12	Establish Hull carbon emission reporting process	Agreed methodology for key Hull organisations/ businesses to measure and report annual emissions	Hull City Council/ ONE HULL	2011	Existing resources and partner support
4	3,9,12	Produce Adaptation Risk Assessment Tool and identify key areas for assessment	Assessment Tool and timetable for work agreed by ONE HULL	Hull City Council/ ONE HULL	2011	Existing resources
5	3	Complete Sub-Regional	Understanding of the	North East	2011	Regional

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
		Local Climate Impact Project	historical weather events and impacts in Hull and other sub-regional authorities	Lincolnshire Council		Efficiency and Improvement Programme
6	3,9,12	Produce Adaptation Strategy and Action Plan for the City	Adaptation Strategy and Action Plan agreed by ONE HULL	Hull City Council/ ONE HULL	2012	Existing resources plus partner support
7	3,4,5,7,13	Hold Sustainable Procurement Conference to share best practice in the City	Conference held and Increased understanding of challenges and opportunities	ONE HULL	2012	Existing resources
8	3,4,5,6,7,11,12,13	Develop inter-business events to link innovation, design and production businesses for manufacturing/ providing services with less resources	Series of events held targeting key business sectors. Increased understanding of challenges and opportunities	ONE HULL	2012	Existing resources
9	2,3,7,8,11,12,13	Develop Hull City Council Service Delivery Plans and Report templates and research to include commentary on climate change	Embedding of climate change issues within the decision making structure of Council	Hull City Council	2011	Existing resources
10	12,13	Develop sustainable Local	Promotion of low	Hull City	2011	Existing

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
		Transport Plan 3	carbon travel and infrastructure improvements to reduce carbon emissions and sustainable travel	Council		resources
11	13	Submit Plugged in Places funding application	Installation of city side electric vehicle charging infrastructure	Hull City Council	2010	Government Grant and partner funds
12	All	Investigate opportunities for accessing European funding	Increased income to the City to deliver climate change projects and fill funding gaps	Hull City Council	2011 onwards	Existing resources
13	1,2,3,4,12	Hold Humber Housing Partnership Seminar on climate change challenges	Increased understanding of challenges and areas for future working across Partnership	Humber Housing Partnership/ Hull City Council	2010	Existing resources
14	1,2,3,4,8,12,13	Hull City Council Energy Strategy	Council identifies business actions to reduce carbon reduction and increase energy security	Hull City Council	2011	Existing resources
15	2,3,4,11,13,14	Develop City wide resident communications campaign	Increase resident and employee understanding of climate change and	ONE HULL	2011	ONE HULL partners

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
			action they can take to mitigate and adapt to changes			
16	2,3,8,12,14	Develop new homes to Code for Sustainable Homes Level 4	57 homes for the City Council and Pickering Ferens Homes built	Hull City Council/ Pickering Ferens Homes	2012	Homes and Communities Agency
17	2,3,11	Undertake staff awareness raising campaign	Reduction in the carbon emissions from business operations of Hull City Council, NHS Hull, University of Hull and Hull and East Yorkshire HNS Hospital Trust	Hull City Council	2011	Partner specific funding
18	1,2,3,5	Investigate potential for renewable energy in NHS buildings	Data on monthly energy use, position on opportunities for green energy tariffs and renewable retrofit/ new build agreed by Board	NHS Hull	2011	Existing resources
19	13	Reduction in emissions from staff travel	Promote cycle scheme, car sharing, staff travel survey, site specific travel plans	NHS Hull	2011	Existing resources
20	12	Investigate impacts of	Develop emergency	NHS Hull	2011	Existing

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
		extreme weather on service delivery	plans based on climate projections for 2020, 2050 and 2080			resources
21	7	Implement sustainable procurement strategy	Reduce unnecessary resource use, support for local businesses	NHS Hull	2011	Existing resources
22	2,3,4,12,14	Develop Preventable Seasonal Excess Deaths Action Plan	Reduction in preventable winter deaths	Hull Affordable Warmth Partnership	2011	Existing resources
23	2,3,4,14	Reduce the number of people in fuel poverty	Fewer people in fuel poverty, fuel efficiency of City housing stock improved	Hull Affordable Warmth Partnership	Annual targets	Existing resources
24	2,3,12,14	Complete City assessment of areas of deprivation	Targeted fuel poverty advice, partner data sharing agreement	Hull Affordable Warmth Partnership	2011	Existing resources
25	2,5,14	Invest in energy efficiency measures in Council housing	3,200 loft and 550 cavity wall insulations, 850 heating replacements, improve 224 high rise flats	Hull City Council	2011	Existing resources
26	2,3,4,5,12,14	Complete Actions in Affordable Warmth Action Plan	Reduction in the number of fuel poor households	Hull Affordable Warmth Partnership	2012	Existing resources

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
27	2,8,9,13	Achieve BREEAM accreditation for all Building Schools for the Future (BSF) schools	Achieve "very good" rating as a minimum for all schools	Building Schools for the Future	2011-2013	Existing resources
28	1,5,6,7,8,9,11	Biomass Supply for school space heating	Paper to BSF Board to establish a local supply chain	Building Schools for the Future	2011	Existing resources
29	1,5,6,7,8,9,11	Establish potential for wind energy supply for BSF schools	Feasibility study into specific site potential completed	Building Schools for the Future	2011	Existing resources
30	2,8,9,12	Reduce operational energy use in BSF schools	Energy/ lighting management technology, water saving, passive ventilation/cooling installed	Building Schools for the Future	2011-2013	Existing resources
31	2,8	Ensure high thermal efficiency of school buildings	Insulation and air tightness higher than industry standard	Building Schools for the Future	2011-2013	Existing resources
32	3,11,12,13	Work with school staff to maximise comfort and operation of new buildings	Technology to manage schools energy use effectively used and resource use reduction embedded in operational practices.	Building Schools for the Future	2011-2013	Existing resources
33	1,2,3,8,9,10,12,13	Adopted Core Strategy for the City	All developments to produce sustainable	Hull City Council	2013	Existing resources

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
			development statement to show carbon reduction, flood adaptation and renewable energy generation/ use			
34	9,10	Deliver Local Biodiversity Action Plan	Improvements in biodiversity through improved habitats and species protection	Hull City Council	Annually	Existing resources
35	3,4,7,11,12,13	Increase understanding of climate change threats and opportunities amongst city centre businesses	Developed information sheets on climate change for businesses	Hull City Council/ Hull BID	2011	Existing resources
36	All	Create City climate change web site	Single access point for information on what can be done and what has been done in the City on the Measures of Success.	Hull City Council/ ONE HULL	2011	Existing resources
37	3,4,8,9,10,12	Aqua Greens Flood Storage Project	Effective water storage space to protect urban area	Hull City Council	Feasibility Study 2011 Installation 2011-13	Existing Resources
38	3,4,8,9,10,12	Flood Mitigation Modelling and Investment Plan	Assess the impact of flooding and necessary	Hull City Council	2011	Existing Resources

Reference No	Objective Addressed	Action	Outcome	Lead Organisation	Timescale	Resources
			investment required by partners			
39	3,4,8,9,10,12	Hazard and Risk mapping of all significant flood risks in the city	Detailed assessment of flood risks	Hull City Council	2013	Existing Resources
40	3,4,8,9,10,12	Significant Flood Risk Action Plan	Action Plan to address the issues raised in Actions 38 and 39	Hull City Council	2015	Existing Resources