

***STOCKTON ON TEES  
CLIMATE CHANGE  
ACTION PLAN  
2009-2020***

**DRAFT**

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## **Preface**

The government has made it clear that action by local authorities is critical to the achievement of the Government's climate change targets. Stockton-On-Tees Borough Council's role will be in providing community leadership to focus attention on tackling climate change through local action. By setting an example, we will not only reduce carbon emissions but also influence individual behaviour as well as that of local businesses, partner organisations and suppliers.

This action plan aims to enable the community to mitigate their contribution towards, and adapt to the impacts of climate change. To make any real progress, it is essential to raise awareness of climate change issues in all sectors of our community. When people understand the link between carbon emissions and climate change they are more likely to change their lifestyle.

Everyone making a few small lifestyle changes could reduce Stockton's overall carbon emissions substantially. An action that seems insignificant on its own can combine with other actions to create a significant overall impact. If every individual, household and business in the borough made a small behaviour change towards being more environmentally friendly, we can achieve our carbon reduction target.

There is of course always going to be sceptics of the climate change issue. Climate change is a fact of life, and scientific evidence suggests that human activity is the major contributing factor. It is not too late to react to these changes and sustained, well co-ordinated action now can have a very positive effect on future global climate.

With this in mind please take this unique opportunity to work with us in partnership to secure a better future for all.

Councillor Ken Lupton  
Leader of Stockton Borough Council

Jeremy Garside  
Chairman of Stockton Environment Partnership

## Stockton Profile

The Borough of Stockton on Tees (SBC) is the largest, in terms of population, in the Tees Valley sub-region, estimated to be 186,700 mid 2005 having grown by 4.4% since the 2001 census. It is the second largest in area of the five local authorities with 209.8sq km. The Borough straddles the river tees and has, in effect, four centres – Billingham, Stockton, Thornaby and Yarm.

The population estimate has shown an increase of 4.4% in population since the 2001 census and a 7.8% increase in the number of households between 1991 and 2001 with a prediction of 82,300 households by 2011.



Stockton is an area of extreme socio-economic contrasts. Based on the Governments Index of Multiple Deprivation 2004, 34% of the Local Super Output Areas (LSOAs) within the Borough fall within the 20% of the most deprived nationally, conversely areas such as Ingleby Barwick are among the least deprived nationally.

Stockton is a major employment and retail centre in the Tees Valley. It contains Queen's Campus of the University of Durham and is an historic market town. Recent developments, such as Wellington Square have enhanced its retail function and the city region with financial and business services. The development of the Tees Barrage has transformed Stockton Riverside and provides a focus for attracting further office development, employment uses, housing and the expansion of the university at North Shore. There is also a major opportunity to link the town centre back into the Riverside.

## 1.0 Introduction

In recent years the issue of climate change has been thrust into the media spotlight. An increasing number of weather related disasters have hit the headlines, from hurricane Katrina that devastated New Orleans in 2005 to flash floods in the UK in Yorkshire and Gloucestershire in 2007 and Northumberland in 2008. The occurrence of these events are now more frequent and the effects far more severe than ever previously recorded.

There is now strong and indisputable evidence that climate change is occurring and that man made emissions are the cause. As this problem is largely man made, it is the responsibility of us all to act now in taking preventative measures before its too late.

The Stern Review<sup>1</sup> 2006 examines the evidence on the economic impacts of climate change. It recommends that early actions on climate change are required as ignoring climate change will damage economic growth. The benefits of strong and early action would considerably outweigh the costs. Additionally, given that climate change is happening, the provision of measures to help people adapt to it are essential.

The Kyoto Protocol was finally adopted in February 2005 shortly after Russia's ratification of the protocol. This committed the signatories to reducing world greenhouse gas emissions to 5.2% below 1990 levels by the year 2012. The UK government signed the Kyoto protocol and set a target to cut greenhouse gas emissions by 12.5% by 2012. The UK Government has now passed the world's first long term, legally binding framework to cut greenhouse gas emissions with the introduction of the Climate Change Bill in December 2008 Their stated aspiration is to cut greenhouse gas emissions by 26% by 2020 and 80% by 2050.

This action plan seeks to make a contribution towards meeting these national and global targets. It sets a challenge for the community on what is undoubtedly the biggest issue we are facing today.

In November 2002 Stockton Council signed the Nottingham Declaration on Climate Change. In doing so we made a commitment to "prepare a plan with our local

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<sup>1</sup> STERN REVIEW: The Economics of Climate change, published on 31<sup>st</sup> October, 2006

communities to address the causes and effects of climate change and to secure maximum benefit for our communities.”

Stockton-On-Tees Borough Council is part of the Tees Valley Climate Change partnership, which was established in 2005 and includes the five Tees Valley local authorities, the Environment Agency, Renew Tees Valley, Tees and Durham Energy Advice Centre (TADEA) and the Energy Savings Trust. The Tees Valley Climate Change Strategy has produced a Climate Change Strategy which aims to tackle climate change in the most efficient way through sharing resources and efficient sub-regional collaboration on cross-boundary issues. The target set by the Partnership is to reduce greenhouse gases emissions by 21% by 2020 relative to 2005 emissions, and as an active supporter of this pioneering sub-regional partnership, Stockton-On-Tees has agreed to contribute to the delivery of this target.

#### This action plan

- Identifies our collective responses to the threat of climate change and achieves emissions reductions.
- Identifies our collective adaptive actions needed to improve our reliance to the effects of climate change and extreme weather events caused by climate change.
- Raises the awareness of climate change through working with public and private sector organisations across the region.
- Involves communities to make sure that they understand what actions that they might undertake to reduce their greenhouse gases emissions and adapt to climate change.

## 2.0 Aims and Targets

The key aims of this action plan are:

- To reduce greenhouse gases emissions from within the Stockton Borough Council area through reducing energy use, better waste management, the use of sustainable transport and green procurement.
- To raise awareness of the factors which cause climate change.
- To involve communities and encourage them to take necessary actions to tackle climate change.
- To provide a framework to adapt to the inevitable impacts from climate change.
- To demonstrate the social, economic and environmental benefits of taking climate change actions.

In setting a target for reduction in carbon dioxide emissions it was essential to be both realistic in terms of what should be achievable as well as challenging in order to make the changes needed to secure a sustainable future.

The target for Stockton Borough Council is to reduce greenhouse gas emissions by 21% by 2020 against a 2005 baseline. This target is being mirrored by the other Tees Valley Authorities through the Tees Valley Climate Change Partnership. The year 2005 was chosen for the baseline as it is the baseline for national statistical data collated by Defra and widely used by all local authorities for reporting and target setting.

This action plan identifies the actions that are needed to respond to the threat of climate change. To deliver the plan we will need to raise awareness of climate change through working with public and private sector organisations across the Borough. Involving communities and businesses is vital in order that they commit to actions to reduce their greenhouse gas emissions.

### 3.0 From a Global Issue to Local Action

#### What is climate change?

Through time, the earth's climate has naturally fluctuated. However in modern language, climate change is commonly associated with 'global warming' and the 'greenhouse effect'. The Third Assessment Report (TAR) of the Intergovernmental panel on Climate Change (IPCC) stated that "There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities."

Man-made greenhouse gas<sup>2</sup> emissions have noticeable effects on the earth's climate. At present, about 6.5 billion tonnes of carbon dioxide (CO<sub>2</sub>) is emitted globally each year, mostly through burning coal, oil and gas for energy. The increasing CO<sub>2</sub> concentration in the atmosphere has already led the average global temperature to increase by 0.6°C in the past century due to the greenhouse effect. TAR projects that global average surface temperatures will rise by a further 1.4 to 5.8°C by the end of this century.

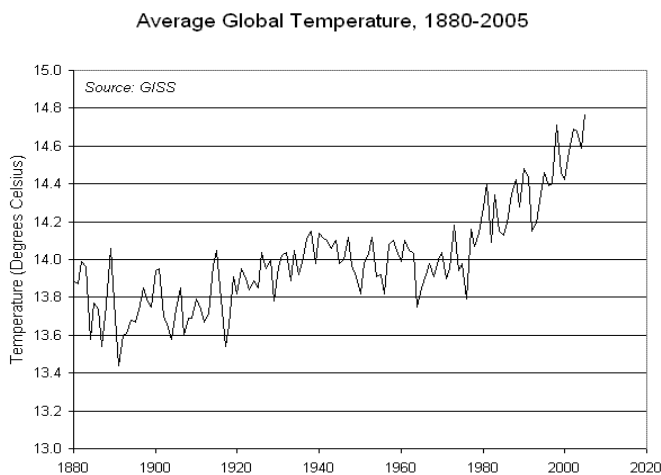


Fig 1a

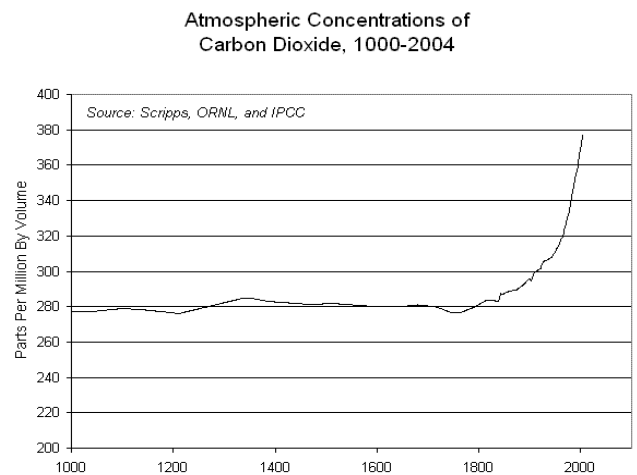


Fig 1b

Figure 1a and 1b shows the changes of global atmospheric concentrations of CO<sub>2</sub> and global temperature

<sup>2</sup> The six principal greenhouse gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride



## What are the global impacts of climate change?

Climate change is one of the most serious environmental threats facing the world today. Global temperature increase is likely to trigger serious consequences for humanity and other life forms alike. The key global impacts are shown below:

- *Rising sea levels* – A rise of over 40 centimetres is expected by 2080 because of thermal expansion of oceans as temperatures rise and because of melting land ice.
- *Flooding* – 80 million people are projected to be at risk of flooding.
- *Food shortage and disease* – Africa, Middle East and India are expected to experience significant reductions in cereal yields, and an additional 290 million people could be exposed to malaria by the 2080s.
- *Severe water shortages* - In some areas, water resources for drinking and irrigation will be affected by reduced rainfall or by salination of ground water as sea levels rise.
- *Loss of tropical forests* – By 2070 large parts of northern Brazil and central southern Africa could lose their tropical forests because of reduced rainfall and increased temperatures.

The vulnerability to the impacts of climate change varies from country to country. Developing countries are believed to be more vulnerable than developed countries. Unlike industrialised countries, developing countries might not have the ability to adapt to the adverse impacts of climate change. Furthermore, evidence shows that the current CO<sub>2</sub> level in the atmosphere are mainly derived from the developed countries. Fig 2 shows that between 1850 and 1950, CO<sub>2</sub> emissions from developed countries increased dramatically whereas developing countries had little contribution to the total emissions. Developing countries' emissions only started to increase since 1950 and they are largely linked to the consumption of goods manufactured in those countries by the more affluent areas of the world. Therefore the situation that we are facing today is as the result of the historic emissions from the developed world. There is a clear moral responsibility to reduce our emissions in order to tackle climate

change, at the same time support the developing countries through sharing of technologies to reduce emissions.

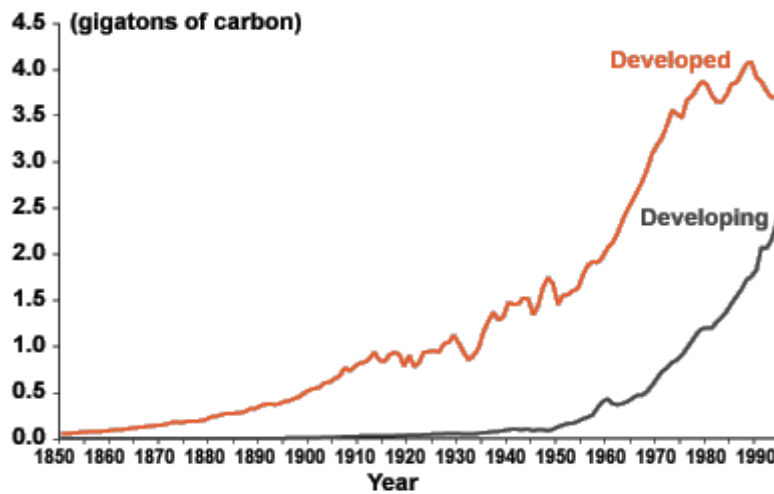
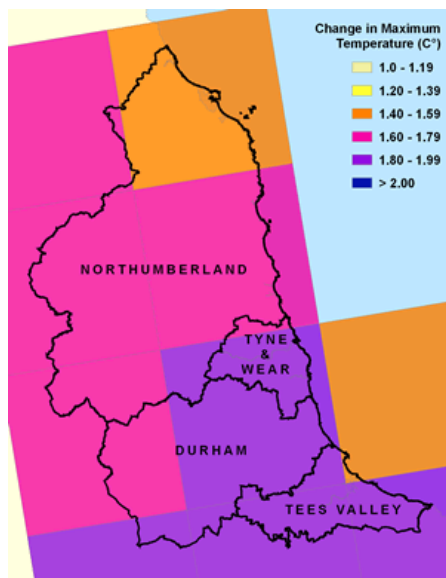


Figure 2: Annual emissions of CO<sub>2</sub> from industrial sources, 1859 to 1995

### What are the impacts of climate change on Stockton-On-Tees?



The UK Climate Impacts Programme (UKCIP) predicted that there will be a 0.5°C to 1°C increase in annual temperature in the North East by 2020s. The predicted impacts suggest that we will have hotter, dryer summers and wetter, milder winters. Much of the precipitation in the winters will be delivered by intense events. Flash flooding might become more frequent and flooding at the River Tees flood plain (see Appendix I) might worsen. The continuous rise in sea level will lead to higher risk of coastal

erosion and flooding. By 2050s, we could experience 1.5°C to 2.5°C increase in temperature and up to 20% more winter rainfall and 30% less summer rainfall. These predictions are extracted from the UK Climate Impacts Programme based on the most likely scenarios but not the most extreme scenarios.

Climate scenarios for the North East are predicting that by the 2050's the average annual daily temperature will have risen by almost 2%<sup>3</sup>

**An average winter's day will 8.4°C**

(1.3°C warmer than today's average of 7.2°C)

**An average summer's day will be 20.3°C**

(2.4°C warmer than today's average of 17.9°C)

- Heat waves lasting several days could increase by 7-fold by the 2050s compared to the 1970s.
- Short spells of uncomfortably hot weather lasting 1-2 days are projected to be around 40 times more likely in the 2050s compared with the 1970s baseline.
- Some climate projections suggest that by the 2050s, we will experience a hot summer like that of 2003 every other year, and it will occur every year by the 2080s.

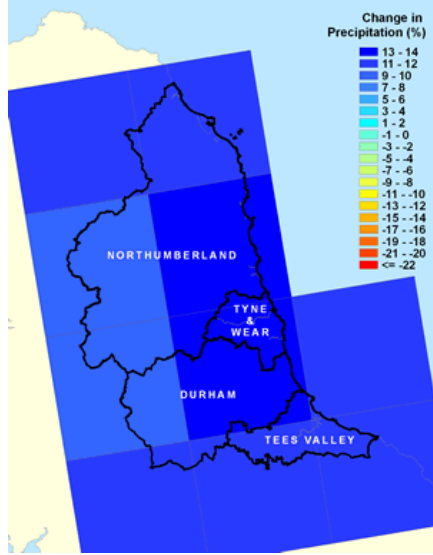
These projections are supported by the observations that we are already experiencing this upward trend with two heat waves occurring in the UK in the last 6 years.

**Average annual rainfall will decrease by 8.6%**

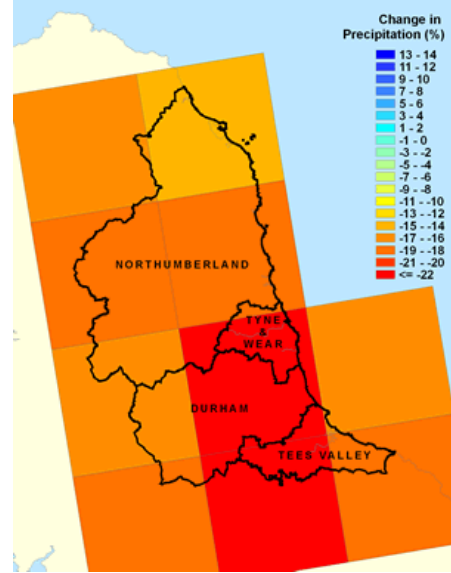
Although projected average annual rainfall shows a decrease, it is expected that rainfall will become increasingly seasonal, with greater winter rainfall and a reduction in summer rainfall.

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<sup>3</sup> EARWIG (the Environment Agency Rainfall and Weather Impacts Generator) developed for the Environment Agency by Newcastle University and University of East Anglia, and uses a 5km resolution which provides a much more detailed projection for local regional areas.



Winter rainfall will increase by 12.7%



Average summer rainfall will decrease by 33.2%

### Agriculture and forestry

As the precipitation pattern changes, some crops and tree varieties may be less suitable to the climate and arable farming may become viable in some previously unsuitable areas. Hotter and drier summers will increase the demand for irrigation. New measures may be required to deal with water shortages. The risk of forest and moor land fires will be higher as a result of drier seasons and new methods of livestock and crop management may need to be developed.

### Lifestyle and built environment

Residents and business will enjoy lower energy usage in winter for heating. However, the demand for water and air conditioning will increase during summer months. Street trees can become water stressed. Buildings, especially historic ones, may be damaged by the extreme weather events such as heavy rainfall and gale force wind. New approaches in the design of buildings will be required in order to cope with these changes, particularly in respect of the ability of buildings to retain heat in winter and maintain a comfortable temperature in summer.

### Tourism

As the temperature increases more people may be inclined to holiday at home or locally. However, the unpredictable and sometimes extreme weather may disrupt people's holiday plans not just at home but also when looking further afield. They may as a result seek alternative locations or rely on indoor activities. Additionally, local tourism business lost between £8,000 and £10,000 in 2007 due to the cancellation of the annual summer events.

### Business

The area has a variety of businesses ranging from service industries such as call centres to chemical manufacturing and heavy engineering. Potentially insurance costs could rise due to the more weather related damage such as flooding and gale force wind. The indoor working climate needs to be controlled so that the workforce has a productive environment in which to work. There may be new business opportunities such as renewable energy technologies, and building design innovations.

### Health

The number of injuries may increase from gale force winds, flooding and other extreme weather events. Heat related deaths could increase due to hotter summers but cold related deaths should decrease due to milder winters. Skin cancer and cataracts may increase, as people could be exposed to the sun more.

### Natural environment

Climate change imposes additional stress to the wildlife habitat. This may bring damages to important habitats. As the weather becomes warmer, some species may migrate northward to find a suitable living environment. As a result, we may see new species in the North East. As the sea level rises this presents a threat to some of the sites of special scientific interest on the Tees estuary.

### Transport and highways

Extreme weather has and will continue to bring disruptions to the transport system. Some infrastructures such as railway track and motorways may require additional maintenance to cope with extreme weather variations between seasons. Drainage systems may require more frequent maintenance to prevent flooding.

### Energy

There may be disruption to supply through weather events bringing down cables. The demand for energy in summer to reduce temperatures at home and in the workplace will increase and the energy demand for heating should reduce.

### **What have we done so far?**

In 2005, Stockton Borough Council joined the other Tees Valley Local Authorities, the Environment Agency, Tees and Durham Energy Advice, Renew Tees Valley and Scottish Power to resource and establish the formation of Tees Valley Climate Change Partnership (TVCCP). The main purpose of which is to catalyse climate change action in the Tees Valley. The partnership has established a baseline of emissions for the Tees Valley and has developed a sub-regional climate change strategy.

The Leader and Chief Executive of Stockton-On-Tees Borough Council signed the Nottingham Declaration on Climate Change in November 2002. By signing the declaration, we committed to reduce greenhouse gas emissions from our own authority's operations especially energy sourcing and use, travel and transport, waste production and disposal and the purchasing of goods and services.

In 2009 Stockton signed the Covenant of Mayors – which was launched by the EU as a local level response to global warming and energy efficiency. Authorities which sign up will commit to reduce their emissions by more than 20% by 2020 (ie beyond the current overall EU target).

Stockton has a reputation and a proven track record in its commitment towards tackling key environmental issues demonstrated through initiatives such as:

- *Stockton Warm Zone* – a three year project to tackle fuel poverty resulting in 15,000 properties being insulated or having new heating systems installed
- *Home Energy Conservation Strategy* – Stockton is one of the few Boroughs in the Country to have met its target in improving the energy efficiency of the housing stock, a massive 25% improvement since 1996
- *Carbon Management Programme* - Stockton Borough Council implemented its Carbon Management Programme in 2008 with the aim of reducing the council's carbon emissions by 25% below 2005/06 levels by 2013. Actions include automatic IT switch off for all schools in the Borough. Streetlight dimming programmes and voltage reduction scheme.
- *An Environmental Awareness Officer* - A dedicated Officer was employed in 2008 to working with schools and communities delivering educational and awareness raising initiatives within Stockton.

- *Kennedy Gardens Community Heating Scheme* – together with our partners WS Atkins and with support from the Energy Savings Trust we have installed high efficiency combined heat and power boilers to serve three high-rise accommodation blocks. This together with the installation of high efficiency boilers to office and leisure facilities in Billingham Town Centre have significantly improved heating standards whilst achieving annual savings of 100 tonnes of CO<sub>2</sub>
- *Travel planning* – Stockton Council has developed its own travel plan, and actively supports sustainable travel within the borough by assisting with the development of school and workplace travel plans. All schools in Stockton will have a travel plan in place by 2010, and businesses are encouraged to use Stockton’s travel planning web portal to develop their own travel plans.
- *Carbon Footprinting*.- Stockton worked with Ove Arup to deliver a total carbon footprint of the Council’s carbon emissions. The report cover not only direct emissions from energy used to provide lighting, heat and from fuel used in council vehicles; but also the indirect emissions from the procurement of services and goods. This report lead to an action plan to review the way the council procures its goods and services and has helped develop elements of a revised Sustainable Procurement Strategy.
- *Waste management* – Stockton has an integrated approach towards waste management with less than 5% of the domestic waste produced in the Borough going to landfill, 80% incinerated with energy recovery and an increasing recycling rate

All of these initiatives are contributing to greenhouse gas emission reduction. By producing this action plan, gaps have been identified and actions developed to meet the agreed targets.

**Key plans and policies that will take forward the aims of this action plan:-**

Local Development Framework (LDF)

The LDF process has commenced with the drafting of the core objectives. It is a “portfolio” of local development documents that provide spatial policies to meet the community’s social, economic and environmental aims for the area. The timetable for this process is up to the end of 2010.

#### Local Transport Plan (LTP) 2006-2011

The Plan sets out a clear analysis of the factors influencing the Borough's transport network, pinpoints the issues that will need to be addressed over the coming years and identifies the outcomes we need to achieve.

#### Environmental Policy 2007-2011

The Environmental Policy aims to improve the Council's environmental performance. It provides a framework for action and for the setting of environmental objectives and targets.

#### Community Strategy 2005-2008

The Community Strategy sets out the key priorities for the Borough of Stockton-On-Tees. Five key themes are outlined, each with an ambitious programme of objectives and delivery plans through the Thematic Partnership(s).



## 4.0 Baseline

### Carbon dioxide emissions baseline

To be successful in reducing greenhouse gas emissions, we need to establish the main sources of emissions and the amount of greenhouse gas that is released in the Borough. Defra's Local and Regional Emissions Data for 2005<sup>4</sup> has estimated Stockton-On-Tees greenhouse gas emissions for housing, industrial, commercial and transport sectors. Emission from waste was calculated from Joint Strategy Unit waste records. The sources of emissions in 2005 are shown in the table below:

<b>Sector</b>	<b>Carbon Emissions 2005 (tonnes CO<sub>2</sub>e)</b>	<b>Interim targets for 2012 (tonnes CO<sub>2</sub>e)</b>	<b>Target emission by 2020 (21% reduction) (tonnes CO<sub>2</sub>e)</b>
<b>Housing</b>	432,000	423,000	341,000
<b>Industrial &amp; Commercial</b>	2,852,000	2795,000	2,253,000
<b>Transport</b>	387,000	379,000	306,000
<b>Waste</b>	21,000	20,500	16,500
<b>Total</b>	3,692,000	3617,500	2,916,500

*Note:*

- *Industrial & commercial emissions do not include emissions from major industry.*
- *Transport emissions do not include emissions from trains, aviation and shipping industry.*
- *Waste emissions do not include emissions from commercial waste.*
- *Waste emissions are calculated from financial year 05/06 waste data.*
- *CO<sub>2</sub>e = Carbon Dioxide equivalent.*

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<sup>4</sup> 'Local and Regional CO<sub>2</sub> Emissions Estimates for 2005', produced by AEA Energy & Environment for Defra (see [www.defra.gov.uk/environment/statistics/globalatmos/galocalghg.htm](http://www.defra.gov.uk/environment/statistics/globalatmos/galocalghg.htm))

The emission reduction target of 21% below 2005 baseline figures by 2021 will be addressed across all sectors and reported on separately. This is to reflect the unique challenges faced by Stockton with industrial and commercial emissions. Stockton on Tees is a heavily industrial area with many intensive energy users in the manufacturing, and chemical processes sector based here.

An interim target for 2012 has been included to coincide with the end of the Government's first 5 year carbon budget (2007-2017).

In the short term - Stockton wishes to support its industry which is a major source of economic input and employment, but also recognises the need to promote energy efficiency within its business and commercial sector. To strike a balance here, Stockton Borough Council aims to support industry via the Green Business Network and the Tees Valley Resource Efficiency Club, to promote energy efficiency and carbon reduction through improved sustainable procurement and increases in waste and resource efficiencies.

Looking at the longer term picture for Stockton, the Council also recognise the changes in the commercial sector which will inevitably take place over time. There is likely to be a decline in heavy manufacturing and petro-chemical based industries, and therefore it is important to ensure that the emerging 'green business' sector which is developing in the Tees Valley is well supported via Renew-CPI.

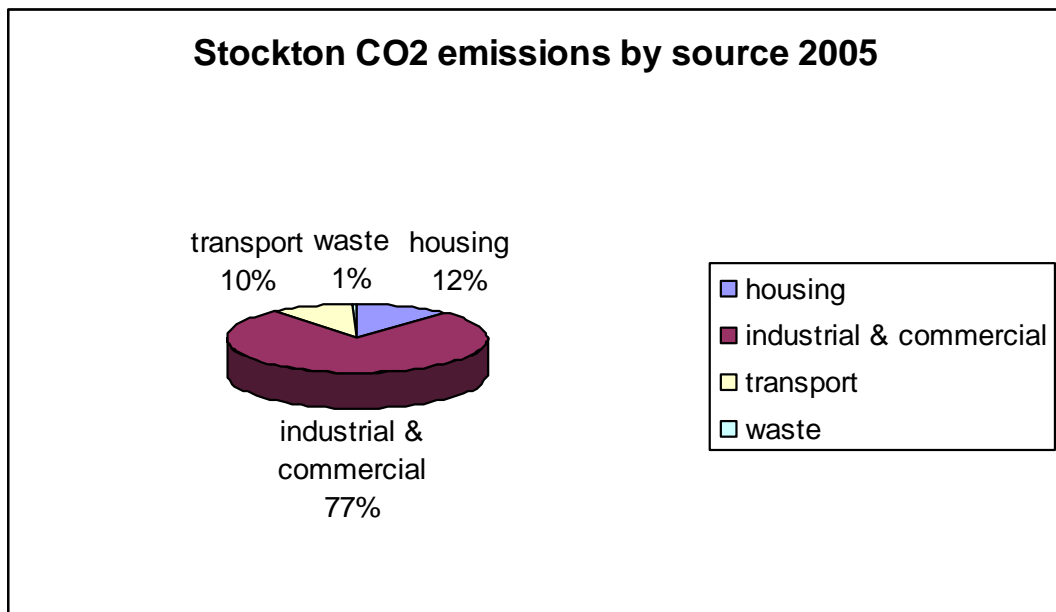
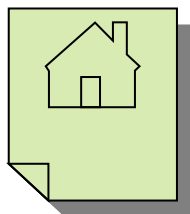


Figure 3: CO<sub>2</sub> emissions by source in Stockton-On-Tees Borough

In the year 2005, Stockton-On-Tees emitted roughly 3,692 kilo tonnes (kT) of carbon dioxide (or equivalent) with 819 kilo tonnes coming from household energy consumption, personal transport and household waste and 2852 kilo tonnes from industrial and commercial activities.



**The average home in Stockton is responsible for emitting a total of 10.36 tonnes of CO<sub>2</sub> per year.**



**The average resident in Stockton each has a carbon footprint which is equivalent to 4.3 tonnes of CO<sub>2</sub>.**

The percentage share of industry emissions was clearly higher than domestic emissions mainly due to the significant energy users in the chemical and engineering industries.

## **5.0 Mitigation – reducing greenhouse gas emissions**

It has been widely agreed that the most effective way to tackle climate change is to reduce greenhouse gas emissions. We need to reduce our emissions across all sectors if we are to make real progress on tackling climate change. The UK government has introduced several schemes and policies using both fiscal measures such as the Climate Change Levy and the UK Emissions Trading Scheme, as well as grant schemes such as Warm Front and the low carbon buildings programme to encourage and provide incentives to domestic and business sectors to reduce emissions.

The Stern review 2006 suggests that there are four ways to cut greenhouse gas emissions:

- Reducing demand for emissions-intensive goods and services.
- Increased efficiency, which can save both money and emissions.
- Action on non-energy emissions, and supporting land management practices that increase the amount of atmospheric carbon captured and stored in “carbon sinks” such as trees, woodlands and soils.
- Switching to lower carbon technologies for power, heat and transport.

### ***Energy***

People are used to a lifestyle of high-energy usage. We use energy to keep warm, for washing, cooking, and leisure activities such as the television, computers as well as travelling to work and foreign travel. If we want this lifestyle to continue, we need to use energy more efficiently.

In the past 50 years, we have been relying heavily on fossil fuel based energy. The main source of CO<sub>2</sub> emissions is derived from the combustion of fossil fuel. Therefore reducing the use of fossil fuel based energy is crucial to reducing greenhouse gas emissions. The use of renewable energy produces zero greenhouse gas emissions. This is the most environmental friendly form of energy and will help to tackle climate change.

## ***Saving Energy***

The most cost effective and logical way to reduce our greenhouse gas emissions is through reducing the amount of energy that we consume or becoming more energy efficient. The Carbon Trust has estimated that energy inefficiency accounts for nearly 1/3 of energy use. Offices could save up to 15% of their total expenditure by reducing energy wastage. This section examines the possible climate change actions in the domestic, commercial and public sectors.

### **Domestic Sector**

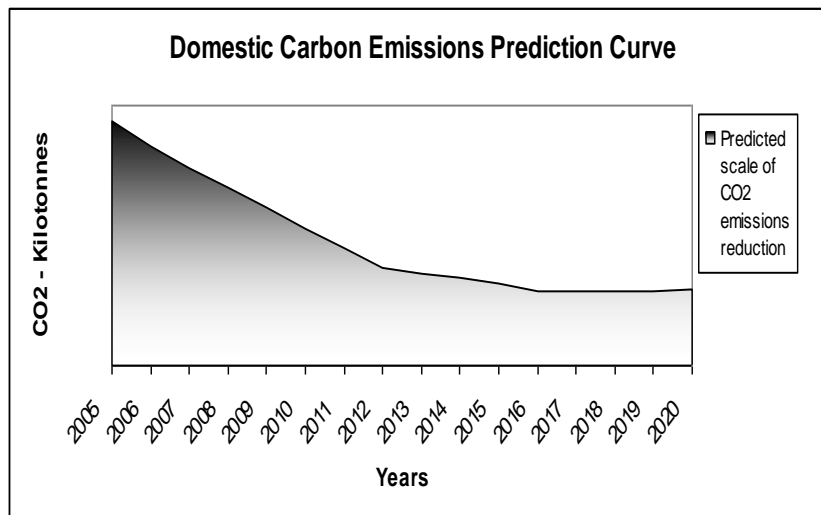


Figure 4: Housing Emissions Prediction Curve, 2005 to 2020

The 2005 emission data (fig 3) shows that the second greatest source of emissions comes from residential property, accounting for 12% of greenhouse gases produced in the Borough. Energy saving measures and the use of greener fuel supplies could significantly reduce the carbon emissions from the domestic sector.

The Home Energy Conservation Act 1995 (HECA) strategy was developed in 1996 with the aim of improving the energy efficiency of the housing stock by 25% by 2006. The position in Stockton at the end of March 2005 showed a saving of 25.8%, meaning the target was not only exceeded but also achieved a year early. The Government then asked that Stockton stretch the target, which we have done, and are now aiming to achieve a 32% improvement by 2011.

Achieving improvements in energy efficiency becomes progressively more difficult. The reasons for this are that those households who are eligible for measures to be installed free of charge through grant schemes such as warm front have largely been tackled and those households who have responded to more traditional marketing tools have also taken up improvements. To achieve the goal of 32% improvement on the 1996 baseline Stockton have implemented an action plan that will engage those households who have either not been influenced by previous marketing campaigns or who are not entitled to grants or free measures. An able to pay scheme has been introduced through Stockton's partnership work with Go Warm, which allows residents not able to benefit from grants to install measure at an affordable rate. With high levels of deprivation and a substantial level of older housing stock it is no surprise that Stockton has a significant number of fuel poor households i.e. those households who need to spend more that 10% of their income on keeping warm. The Go Warm initiative offers benefits advice to all residents and encourages the take up of insulation measures Go Warm works alongside the Comfort Zone project the aim of which is to put in place a mechanism to eliminate fuel poverty in vulnerable households by 2010 in line with the Governments fuel poverty strategy. This relies on a mixture of hard measures such as insulation and heating repairs to softer measures like energy and benefits advice.

It is now compulsory for homes for sale in England and Wales to obtain an energy performance certificate, which will rate the property from A to G for both energy efficiency and environmental impact. In addition, from October 2008 landlords are required to provide an energy performance certificate when they rent a home out. Houses with good energy efficiency measures have the opportunity to benefit from the new legislation, as they will stand out in the market.

Despite great improvement in the energy efficiency of Stockton's housing stock, emissions data from Defra continue to show and increase in emissions from the domestic sector.

	Domestic Gas	Domestic Electricity	totals
2005	250	163	413
2006	253	174	427

Fig 5: carbon emissions – domestic gas and electricity 05/06.

The underlying trend of these emissions is the continued rise in domestic electricity use, see fig5.

Over the past two decades the western world has seen huge growth in the popularity communications, computer and home entertainment equipment within the home. Consumer electronics have now been identified as the single most significant growth area of energy use within the home. Energy efficiency savings gained by the improvement in A+ graded white goods has been outstripped by the increasing popularity of IT and entertainment gadgets, for example, energy use for personal computers and associated equipment – printers, scanners etc) doubled between 2000 and 2006. By 2005, almost a tenth (9 per cent or ~11 TWh) of total domestic electricity was used by computers and their peripherals. Consumption is expected to increase by a further 30 per cent between 2006 and 2020. This is not only due to the continued growth of the home computer market, but also due to the increases in performance required for the latest more energy-intensive games, software and operating systems.<sup>5</sup>

Stockton plans to address the issue of energy use in the home by promoting the use of energy monitors including providing monitors for loan, free of charge, from all libraries within the Borough. The council has also provided free monitors to schools in Stockton for pupils to borrow.

In the short term, behaviour change will have the biggest impact on reducing domestic emissions, and Stockton Borough Council will continue to encourage positive community engagement with energy efficiency by providing advice and raising awareness amongst residents via several road show events throughout the year, regular press releases and the annual Greener Living Road show.

Schools have an important role to play in ensuring that children have an understanding of the impacts of their behaviour on the climate and the need to consider ways to reduce greenhouse gas emissions. One of the initiatives that supports this is the Eco-School Programme, which has three stages, the Bronze and Silver Award and finally the Green Flag. The school has to put certain environmental projects such as better waste management, reduce energy and water consumption

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<sup>5</sup> Energy Savings Trust – The Ampere Strikes Back 2007

etc. into action to achieve different awards. Stockton has 24 out of 82 (September 2006) schools participating, and aims to have all schools signed up by 2012.

Stockton also supported 10 of its schools during the 2008/09 pilot year of The Climate Change Schools Project (CCSP). This is a ground-breaking and unique educational initiative piloted in the North East which aims to put climate change at the heart of the national curriculum and aim to build climate change understanding and positive action from the ground-up. Visionary schools and teachers are at the core of this process, though the focus of the Project is on young people – helping them to achieve a better understanding of the nuts and bolts of climate change science, as well as to discover solutions to the challenges brought by climatic changes over the coming decades. The pilot year has been very successful and the initiative will roll out to more schools in 2009/10.

The project is being coordinated by the Science Learning Centre North East & Durham University, with partners - the Environment Agency & Northumbria Regional Flood Defence Committee, the NorthEast Strategic Partnership for Sustainable Schools & One World Network North East.

The Council, working in partnership with the public and private sectors, can reduce levels of atmospheric carbon by promoting land uses which contribute towards carbon sequestration (i.e. capturing and storing atmospheric carbon in 'carbon sinks' such as trees and other green vegetation, as well as non-living 'reservoirs' such as soils and wood products). There remains some uncertainty about the effectiveness of carbon sinks in offsetting carbon emissions, but it is generally accepted that sustainable management of woodland and soil resources would make a positive contribution. For example, trees can absorb between 7.5kg and 13kg of carbon per year depending on age and species (carbon-info.org). On this basis extending tree and woodland cover within the Borough would make a modest contributing towards offsetting carbon emissions, while at the same time delivering significant benefits in terms of adaptation to climate change.



## Industrial and Commercial

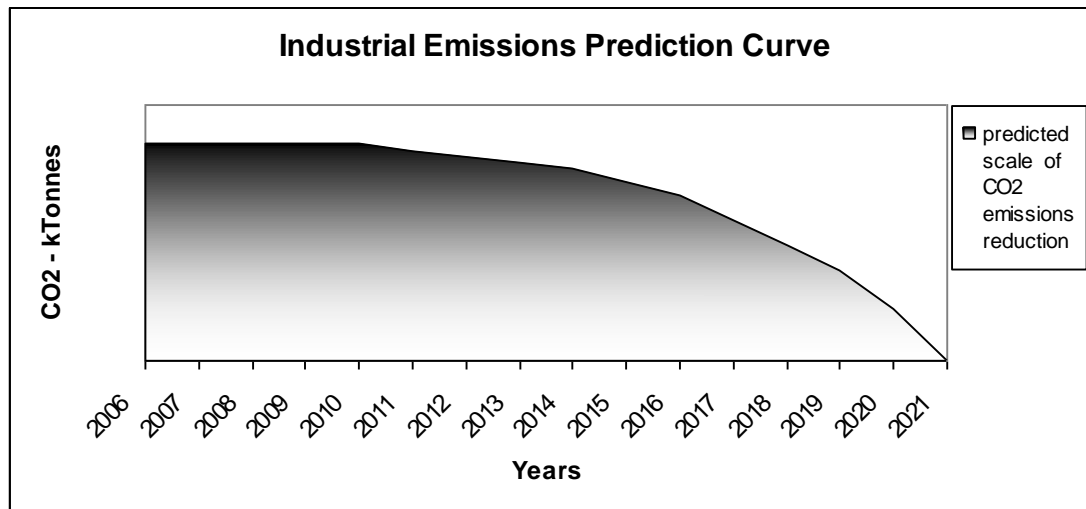


Figure 7: Industrial and commercial emissions prediction curve 2005-2020

A strong economy can provide high living standards and greater prosperity for individuals. It supports businesses, which in turn generate employment and income for individuals. In Stockton borough there are a range of industrial and commercial activities that provide 80,100 jobs for the area. As a substantial proportion of the products manufactured in the area are exported to other regions within UK or other countries the associated emissions from industry and commercial activities in Stockton are not just local issues. It should be seen as part of the global problem.

As part of the commitment to the Kyoto Protocol the UK government has introduced various measures intended to address the environmental problems resulting from energy production and consumption. One of these measures is the Climate Change Levy (CCL), an additional tax on businesses added to their energy bills, although the government maintain that it entails no increase in the tax burden on industry as a whole and no net gain for the public finances. CCL is intended to promote energy efficiency, encourage employment opportunities and stimulate investment in new technologies.

The Government launched the UK Emissions Trading Scheme (UK ETS) in April 2002. Participating companies are allocated allowances; each allowance representing a tonne of the relevant emissions, in this case carbon dioxide equivalent. The scheme allows companies to emit in excess of their allocation by

purchasing additional allowances from the market. Similarly, a company that emits less than its allocation can sell its surplus. By allowing participants the flexibility to trade allowances the overall emissions reductions are achieved in the most cost-effective way possible.

The Carbon Reduction Commitment, a new, legally binding emissions trading scheme, will be launched in April 2010. This will be a mandatory scheme for all commercial users with and will capture all large public and private sector organisation with a half hourly metre usage of at least 6000 mega watt hours. The scheme is designed to drive changes in behaviour and infrastructure and generate a shift in awareness in the industrial and commercial sector.

The CRC is likely to have a large impact on business in Stockton, particularly amongst smaller enterprises. The Council aims to provide guidance via the Green Business Network by setting up a CRC best practice forum to allow networking between companies affected.

The industrial and commercial sector, excluding major industry, produces 45% of Stockton total carbon emissions (see figure 3). With the Climate Change Levy, UK Emissions Trading Scheme and the Integrated Pollution, Prevention and Control (IPPC) regulations, companies will have economic incentives to invest in technologies to reduce their greenhouse gas emissions. The Environment Agency will lead on the delivery of major industry reductions in emissions.

While there is a clear link between economic prosperity and energy use, businesses have the potential to be low carbon and to benefit from the financial and societal gains. To encourage organisations to commit to tackle climate change, the Tees Valley Climate Change Partnership has produced a Tees Valley Climate Change Charter (see Appendix 2). By signing up to the Charter, each organisation would commit to take specific actions to reduce their greenhouse gas emissions.

## Alternative Energy

Most energy we use today comes from the burning of fossil fuels and nuclear power stations (see Figure 8). Carbon and sulphur dioxide emissions are released into the atmosphere when fossil fuels are burnt. In order to reduce CO<sub>2</sub> emissions, we should seek alternate methods to produce energy.

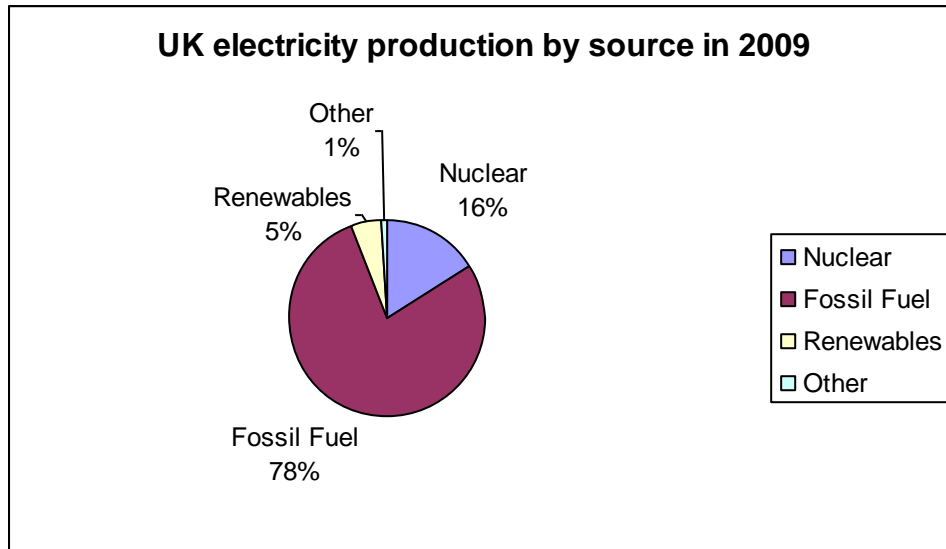


Figure 8: UK electricity production by source

The UK Government has set targets for 10% of the UK electricity to be supplied from renewable energy and at least double the capacity of combined heat and power (CHP) by 2010; and in 2006 this was extended to 20% by 2020..

The Tees Valley currently has two major renewable energy projects:

- Three 2.75Megawatt (MW) wind turbines at High Volts farm, Hartlepool.
- A 30 Megawatt biomass power station at Wilton.

A 2009 study, by Ove Arup, into the potential for wind power in Stockton estimates that there is capability for the installation of 71.5 MW of wind power. However, although this potential has been identified it is not being suggested that these installations will be carried forward.

## Household Waste

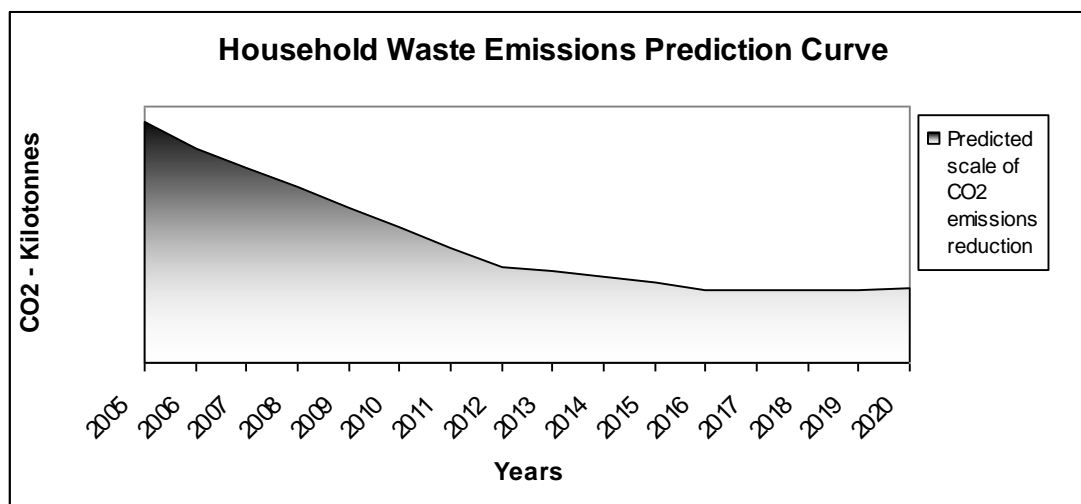


Figure 9: Household waste emission reduction prediction curve, 2005 - 2020

Solid waste disposal contributes to greenhouse gas emissions in a variety of ways. Waste that is collected in Stockton is mainly incinerated or recycled with the residual being land filled. Waste that is landfilled produces methane (one of the most potent greenhouse gases) when the organic elements decompose. Waste incineration can avoid potent methane emissions and in the Energy from Waste plant at Haverton Hill actually produce electricity. Recycling prevents potentially useful materials from being landfilled or incinerated and it also saves energy from processing raw materials to make new products. By far the most effective way to reduce emissions is to re-use products that are no longer wanted or needed such as furniture, clothing, toys etc. The UK government is implementing the EU Landfill Directive across the UK which aims to reduce the negative impact of sending waste to landfill. Article 5 of the Landfill Directive limits the quantity of biodegradable municipal waste that can be disposed of at landfill. One aim of this policy is to reduce the greenhouse gas emissions (both carbon dioxide and methane) generated through the decomposition of this waste stream at landfill sites.

Targets set under the Landfill Directive – the Waste Strategy for England 2007 - to reduce biodegradable waste sent to landfill are as follows –

- 40% recycling and composting rate by 2010
- □ 45% recycling and composting rate by 2015
- □ 50% recycling and composting rate by 2015

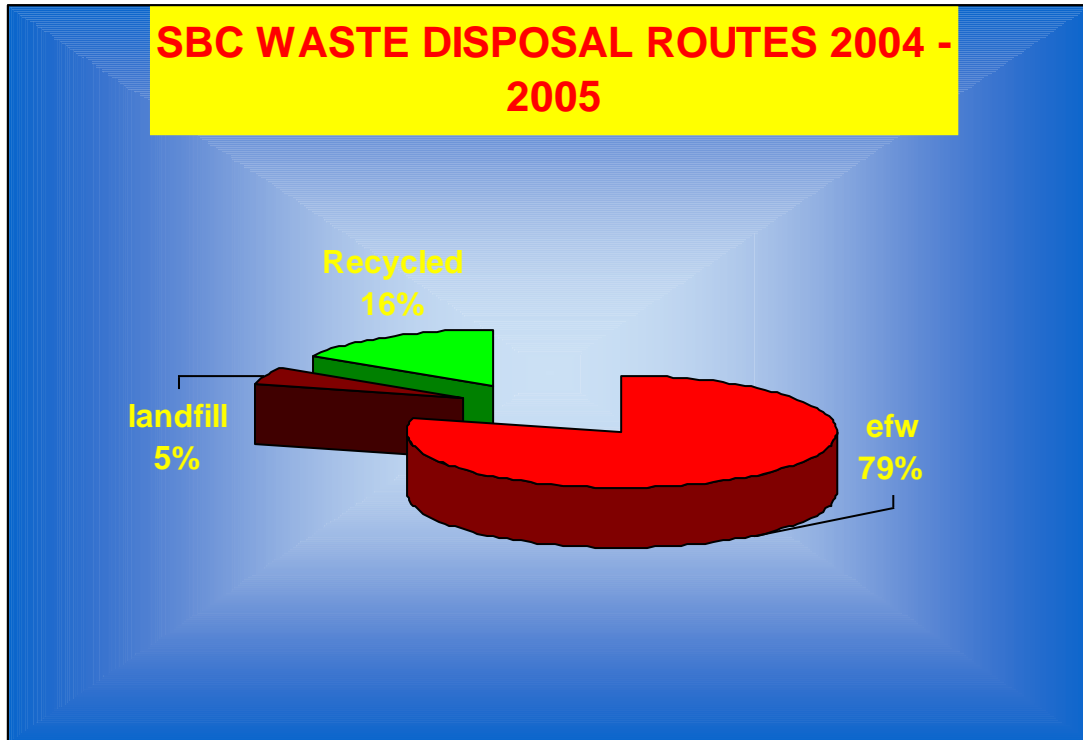


Figure 10: SBC Waste disposal 2004/05

Overall waste management accounted for around 1% of greenhouse gas emissions in Stockton. In 2005 Stockton disposed of 79% of the total household waste generated via the Energy from Waste (EfW) incinerator plant, 16% via recycling and 5% is sent to landfill (see Figure 10). To minimise the impact of our waste management practices on climate change, we should reduce the amount of waste we produce as well as maximising our recycling and home composting rates. A target has been set to achieve 40% recycling of domestic waste by 2010.

In order to achieve this 40% recycling rate Stockton Borough Council recognised the need to extend its recycling collection beyond the glass, cans and paper currently collected. However, increasing the recycling collection has potential negative impacts on the environment, as more vehicles are making weekly collections from some 79,000 households across Stockton, Billingham Thornaby and Yarm. A study into the potential carbon emission impacts of extending the recycling collection in Stockton considered the impacts of collecting materials for recycling against the savings made by the recycling of that material. It was discovered that the benefits of household collection for recycling far outweighed the negative impacts of sending the same material to either landfill or the Energy from Waste Plant.<sup>6</sup>

<sup>6</sup> Carbon Footprinting Stockton's Waste Management System. 2007 Ove Arup

## Transport

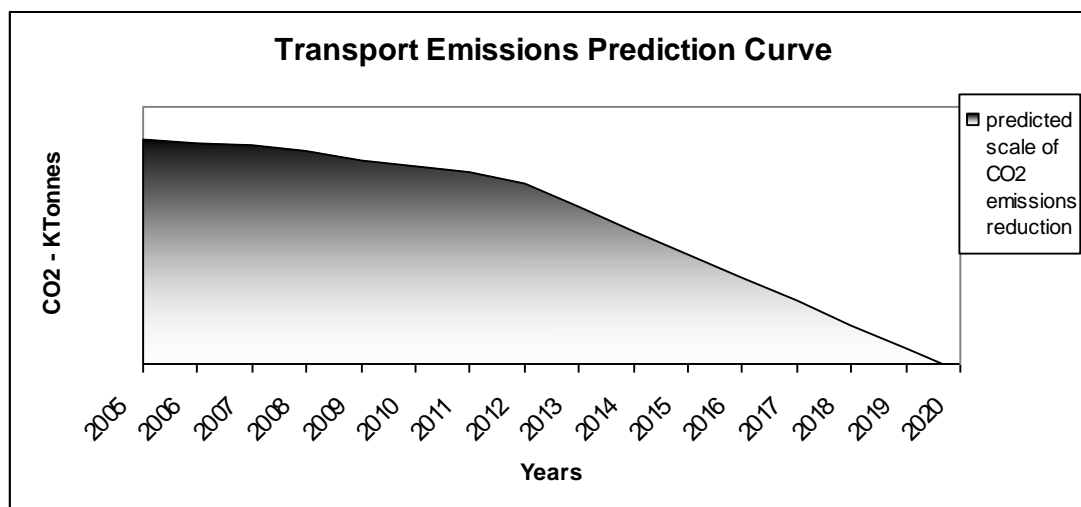


Figure 11: Transport Emissions Prediction Curve, 2005 – 2020

Approximately 10% of total carbon dioxide emissions within Stockton-on-Tees come from transport. A number of factors, including the changing demographic composition of the Borough, increasing levels of economic activity, major new developments (including an ambitious programme of town centre renewal) and rising car ownership are putting increasing pressure on the local transport network. Transport-related emissions will continue to grow if these issues are not addressed.

*Road traffic volumes have shown a steady rise in recent years; the combined average daily traffic flow across the Tees Valley region rose by 10.6% in 2005 against 2000 baseline figures.*

The Second Stockton-on-Tees Local Transport Plan (LTP2), which covers the five years from April 2006 to March 2011, was published and submitted to the Government Office for the North East (GO-NE) and the DfT in March 2006. An LTP3 setting out the Council's Long-Term Transport Strategy beyond 2011 will be published in 2009.

Stockton intends to continue to enhance its public transport provision to restrict the decline in bus patronage within the borough to 10% between 2005/06 and 2010/11, and increase passenger footfall at train stations. The retention of concessionary fares, improvements in timetabling, and the introduction of real time displays has helped to retain this target.

## **Travel Plans**

Stockton Borough Council will also encourage sustainable travel choices by promoting and supporting the uptake of travel planning across the Borough.

- *School Travel Plans*

Currently 13 schools in Stockton have a travel plan in place, and this will be extended to all schools by 2010.

- *Work Place Travel Plans*

All new developments have to provide a travel plan at the planning stage.

Existing businesses can use the Council's on line travel plan tool-kit to prepare a travel plan tailored to their own business.

- *Corporate Travel Plan*

Stockton has its own travel plan and encourages staff to take advantage of care sharing and cycle to work schemes.

## **Active Travel**

Making it easier for people to choose the most sustainable travel options of walking and cycling is also high on Stockton's agenda. Not only creating environmental benefits but also promoting healthier lifestyle choices.

Cycle training, improved cycle parking and storage in town centre locations, and the promotion of guided cycle rides all help to promote cycling as a safe and healthy option.

Active travel is also promoted in all Stockton's schools via walk to school, cycle and pedestrian training events.

## **Eco Driving**

Fuel savings of up to 15% can be achieved by learning to drive in a more economic way.<sup>7</sup> This can provide significant fuel cost savings for both individuals and businesses, and also has a positive impact on carbon emissions, and other pollutants from transport on our roads. Stockton will be rolling out an Eco-Driving course for staff and businesses during 2009.

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<sup>7</sup> EST – smarter driving

## Procurement

As a local authority, we spend around £140 millions on goods, works and services each year. What we buy and how we consume our goods and deliver the services can have a significant impact on greenhouse gas emissions. For example, if we buy locally we could save a substantial amount of emissions from transport.

Simple actions such as choosing energy efficient electric appliances e.g. computers and fridges, and buying goods that are durable or even made from recycled material can reduce the amount of energy that is consumed.

Stockton has produced a Sustainable Procurement Strategy 2009-2012 which aims both to mainstream sustainability within the Council's procurement process, and to work with suppliers to encourage uptake of resource and energy efficiency measures to promote sustainable supply chains throughout the Borough.

In 2008 Stockton published its Total Carbon Footprint, which calculated the total carbon footprint of the Council's operations and procurement activity for the financial year 2007-09. This included direct emissions – relating to energy used to heat Council building and transport fuel; and indirect emission – relating to the CO<sub>2</sub> embedded within the production and transportation of goods and services procured by the Council.

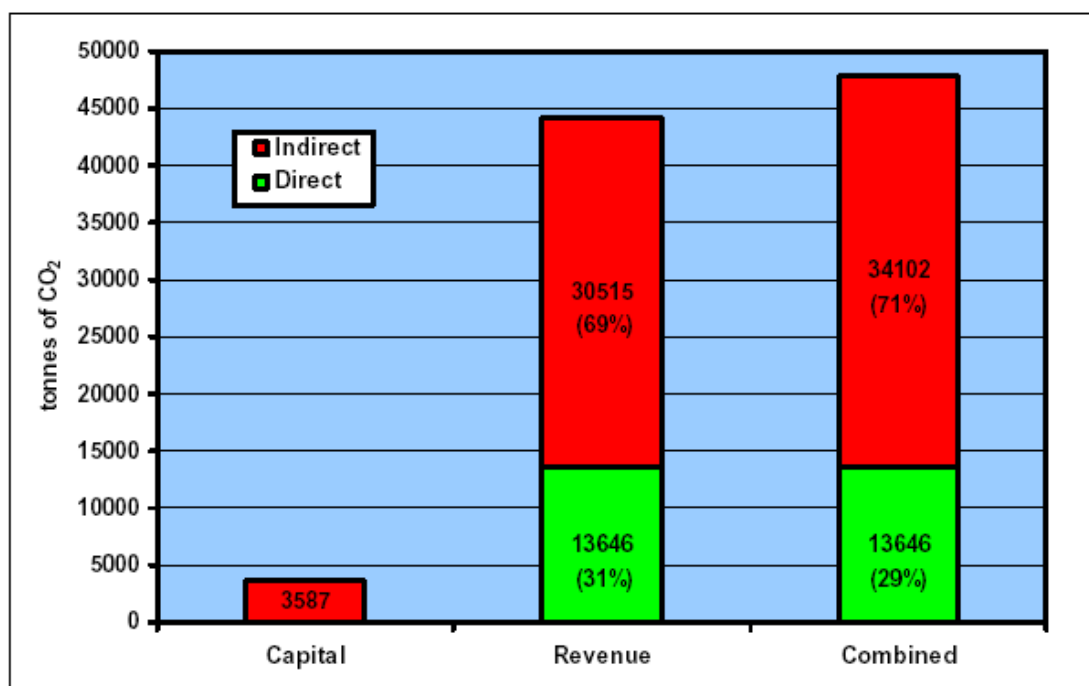




Fig 6 Sockton Borough Council -Total Carbon Footprint

Fig 6 shows that 71% of the Council's carbon emissions occur as a result of its procurement processes. This report is invaluable as it highlights significant areas where the Council can not only influence their suppliers, but also act as an example of good practice to other businesses in the area and share experiences.

## 6.0 Adaptation

It is now widely accepted that climate change will continue over the next 40-50 years regardless of any reductions in carbon emissions. This is because of the length of time CO<sub>2</sub> remains in the earth's atmosphere, and a phenomenon known as 'climate lag' which means today's emissions will take several years to have an effect on our climate.

A changing climate will not only bring warmer drier summers and milder wetter winters in general, but will stimulate increasingly frequent extreme weather events, some of which we are already experiencing, for example the flooding during Summer 2007 and the heat-wave events of 2003 and 2006.

Climate change adaptation is concerned with planning for and reducing the impact of extreme weather events.

*"The flooding in summer 2007, which tested both our flood management policy and response, was in line with predicted increases in scale and intensity of flood events.*

*We experienced the wettest June on record in England, and these extreme conditions led to large scale urban flooding in the North, a lot of which was from surface water run-off rather than from rivers.*

*In July, up to 160 mm of rain fell in 24 hours on already saturated ground, rapidly entered rivers and drainage systems, overwhelming them and causing serious flooding across central England."*

Defra – Water Strategy – *Future Water*  
( Feb 08 )

### Water Supply

Climate change will affect the stability of water supply. Therefore we need to reduce our demand for water and increase efficiency of water use in order to cope with the likelihood of a net loss of 10% in annual rainfall.

### Flooding

Climate change will increase the risk of flooding. A new approach may be needed in flood defence. The design of drainage systems will need to be reviewed to tackle potential flooding of roads and highways. Future development should incorporate the impacts of climate change to reduce the possible risks to people as well as the natural environment from flooding. New building designs will be necessary to resist the potential damage from flooding in high-risk areas. The Pitt Review into the flooding events of summer 2007 lead to many recommendations being put into place

to deal with the planning for, building resilience against and recovering from flood events in the UK.

### Building

The design and construction of our homes and offices will need to change to cope with the changes in the weather, such as with rainfall, wind and the frequency of storms. To cope with the increasing temperature, better cooling systems in buildings may be required. Greater use of sustainable urban drainage will reduce the demands placed upon the existing drains and sewers, while the community could help by reducing the amount of hard landscaping around domestic properties.

### Extremes in temperature

Heat can kill. In the 2003 northwest Europe heatwave 27,000 people died. Britain has experienced its hottest July on record in 2006. Global warming experts claim that by 2050 temperatures will regularly top 40°C and warn that our health and infrastructure will be unable to cope. Precautions necessary to cope with the expected frequency of heat waves are outlined in the document – *Heatwave Plan for England* published in July 2004.

Even small urban green spaces can have an important cooling effect, and temperatures in wooded areas can be significantly lower than in built-up areas, also trees sited near buildings act as natural air conditioners and provide valuable shade both inside and out.

### **The role of Stockton Borough Council within climate change adaptation.**

Stockton council has a potential to address climate change impacts, through its functions as a transport and planning authority, through other service delivery such as building control, community care providers, waste, housing, environmental health and trading standards, and as providers of green space. In addition, through their convening role in local strategic partnerships (LSPs), local area agreements (LAAs) and multi-area agreements (MAAs), local authorities can work in partnership with key delivery partners, such as the Environment Agency (EA).

Climate change will affect service delivery across the board and carries identifiable risks:

- **political risk:** The ability to meet government targets across a number of policy areas, including National Indicators, could be affected by climate change. By embedding adaptation strategies within all policy areas this risk can be averted.
- **business risk:** climate change will affect all levels of service delivery, such as waste disposal and collection, housing services, and planning. By future proofing service delivery against all identifiable weather risks Stockton Borough Council can be confident of maintaining its high standards of service.
- **reputation at risk:** if core policies begin to fail due to climate change, the results will be highly visible – eg repeated flooding of property due to poor surface drainage management. Stockton’s comprehensive risk assessment will allow proactive management of projected climate risks.
- **financial risk:** increasingly people are putting a price on extreme weather events and climate change. The summer floods of 2007 are now estimated to have cost over £3bn. By acting now Stockton Borough Council is protecting itself from the future financial impacts of climate change.
- **community risk:** all communities are at risk, but we know that poorer communities will suffer disproportionately. Assessing potential risk areas now, means that Stockton Borough Council is able to ensure the whole community is protected or has the ability to mitigate against climate change impacts.

### **Adaptation – How Council services will respond**

- Minimising flood risk in Stockton on Tees
- Adapting Stockton’s built environment to improve resilience to a changing climate
- Managing and enhancing Stockton’s green infrastructure to improve resilience to a changing climate

- Resilience planning by enhancing technical and workforce capabilities and community awareness raising

### **Minimising Flood Risk in Stockton on Tees**

Flood risk within the Borough comes from two sources:

- Tidal or river flooding from the Tees and Tees Estuary
- Surface water flooding, caused by heavy rainfall events.

Current Environment Agency Flood Zones indicate the areas within the borough which are currently at risk from river or tidal flooding. There are extensive flood defences within the borough protecting low lying vulnerable areas, including 21 km of flood embankments, and around 200 meters of other flood defences protecting properties in urban areas together with 300m of culverted water course.

Projected climate change up to the 2050s predicts that rainfall will become more seasonal, with lower rainfall during summer months and higher rainfall during the winter. This presents its own problems with the winter soil moisture content becoming higher causing water to run off saturated ground faster and contribute to surface water flooding. An additional problem is the predicted increase in extreme weather events, gales, storm surges, extreme high tides and rising sea levels. This will contribute to breaching and over-topping of the existing flood defence mechanisms placing currently protected properties at risk of flooding.

Surface water flooding occurs due to extreme rainfall and the inability for that rainwater to drain away. Many interlinked factors can cause or exacerbate surface water flooding, such as the intensity of rainfall, the capacity and condition of drainage and sewerage systems, type of surface material, river levels and ground saturation levels. Surface water flooding poses a significant risk in urban areas such as Stockton where increasing development impacts on the drainage and sewerage system, and the increasing use of impermeable surfaces for paths and driveways leave no natural soak away for rainwater and increases the rate of runoff.

At present The Environment Agency has responsibility for river and coastal flooding. Responsibility for surface water flooding, however, is currently split between a number of bodies including; the Environment Agency, Local Authorities, Water Companies and the Highways Agency. Management of local flood risk has, as a result, taken an uncoordinated approach. Following the flooding events of 2007, the Pitt review recommends that local authorities take a leading role in managing local surface water flood risk.

### **Adapting Stockton's Built Environment to improve resilience to a changing climate**

Stockton's housing stock is approx 275,400 and although it is projected to increase to 302,000 by 2016, housing stock turnover is currently very low and it is estimated that the vast majority of the current stock will still be in use for many decades to come. Much of the existing housing in Stockton has been built to the standard dictated by weather conditions of the time and as such will be particularly vulnerable to the changes in climate over this period – especially to extreme weather events such as flooding and heat wave events.

Buildings overheat in several ways;

**Internal Heat Gains** – caused by waste heat from electrical equipment and lighting. Use of low energy equipment reduces waste heat.

**Heat Gain Through Windows** – Sunlight enters through windows and heats up internal surfaces. Use of blinds, shutters and curtains etc will reduce heat gain.

**Heat Gain Through Warming of external surfaces** – Solar heat gain, caused by sunlight striking the outside walls and roofs of buildings, is transferred to the inside of the building. Painting outer walls with a light colour or reflective paint will mitigate against this.

**External Air Temperature** – When the outside temperature is warmer than the internal temperature, open windows will no longer cool a building.

Excessive heat causes discomfort, lack of sleep, lack of productivity and alertness. It is also a risk to health for the most vulnerable in society with elderly, and very young being at most risk.

Planning legislation and guidance is currently in place to ensure new buildings come within a standard framework to ensure adaptation and energy efficiency. However, there is no such legislation to bring existing buildings within these standards. The Decent Homes Standard 2010, whereby all social housing should meet basic comfort standards, only tackles thermal comfort in terms of efficient heating and insulation, and not in terms of cooling.

By ensuring that adaptation measures are fully incorporated into measures resulting from current legislation Stockton Borough Council seeks to ensure that Stockton's built environment will be resilient to climate change over the coming decades. Adaptation should be integrated with carbon reduction measure to ensure that mitigation and adaptation takes place jointly to provide robust and resilient housing stock.

The aim is to utilise cost-effective measures to raise the resilience of existing buildings to enable them to effectively address overheating issues without increasing use of mechanical cooling, thereby having a negative impact on CO<sub>2</sub> emissions.

Adaptation measures should be embedded within the Decent Homes Standard to ensure that the level of thermal comfort being sought takes into account cooling as well as warmth.

### **Managing and enhancing Stockton's green infrastructure to improve resilience to a changing climate**

Adaptation to climate change means making the whole of the Borough of Stockton-on-Tees more resilient. Well-designed, flexible public spaces offer excellent opportunities to adapt to climate change threats. Spaces that are softer, greener, more organic and natural will store water and are critical to modifying urban temperatures. Trees in particular have valuable role to play in cooling the air, shading buildings in summer (helping with mitigation, cutting the need for ventilation and cooling) and capturing carbon.

Green spaces with a generous planting of trees link to form a network offering cooler, cleaner air.

The Biodiversity of Stockton's green spaces is threatened by heat-stress, drought, strong wind and gales

Stockton Borough Council is developing a Green Infrastructure Strategy which will assure a climate proof approach to green space planning, design and management.

### **Resilience Planning and Community Awareness Raising**

Stockton Borough Council will support adaptation at two broad levels, both within its own operations and at community level:

**Building adaptive capacity** – creating the information and conditions (regulatory, institutional, managerial) that are needed to support adaptation, eg the incorporation of sustainable drainage measures within planning. Taking measures to fully appreciate the potential impacts of climate change and the options for adaptation by undertaking climate change risk assessment studies and identifying vulnerabilities. Piloting specific actions and accumulating the resources necessary to implement actions.

**Delivering adaptation actions** – taking steps that will help to reduce vulnerability to climate risks or to exploit opportunities. This may be as low cost and simple as installing blinds on south facing windows, to large scale flood resilience installations.

The Pitt report recommends that Local Authorities should promote business continuity during extreme weather events by encouraging the take-up of flood resilience measures. In addition, local authorities should extend eligibility for home improvement grants and loans to include flood resistance products for properties in high risk areas.

Although Pitt review is concerned with flood risks, it would be good practice to promote resilience measures to both home owners and business for all extreme weather events.

Development of climate change risk assessment plans will inform threshold triggers whereby action will be taken to secure property, building contents, evacuate buildings or put into action other flood event actions, or take action to limit overheating of



buildings and reduce the effects of overheating on clients and staff, or put into place other heat wave event actions

### **Enhance technical and workforce capabilities**

A changing climate and rising incidents of extreme weather events challenges our traditional working methods. We need to ensure that our technical and workforce capabilities are enhanced to deal with extreme weather events occurring now and in the future.

This will ensure that staff is equipped to respond adequately to extreme weather events and to undertake ongoing adaptation measures to ensure continuing service delivery, and minimise risk to life and impacts to buildings and infrastructure.

In addition , technology, and equipment used by the Council should be robust, and adequate enough to deal with events arising from climate change or extreme weather events.

## 7.0 Raising Awareness and Communication

The most up-to-date national and regional research shows that few people in the UK and North East understand what is actually causing climate change. But despite this, they do believe that climate change is happening, and that it is important. Most people think that climate change:

- Is confusing – they can't see how it relates to them;
- Won't affect them personally;
- Is a problem for the future, not now; and
- Can't be affected by their individual actions, because the problem is so big.

In the North East, the climate change awareness levels are slightly below national average. Less than 4 in 5 people are familiar with the terms *carbon emissions* and *climate change* and only 50% of people are aware of the source of carbon emissions.

The need to engage communities, businesses and other organisations in efforts to address the problem of climate change is of vital importance in ensuring the successful delivery of the climate change action plan. Raising awareness and promoting and supporting action within the community regarding the threats from climate change plus the economic opportunities is extremely important. Without community support, the reduction of 21% in greenhouse gas emissions from the 2005 level by 2020 will be difficult to achieve.

Children are more acceptable to changes in behaviour. They are more likely to change their own and perhaps their parents' attitudes if the facts and consequences of climate change are presented to them in a way that is clear and relevant. The curriculum can include climate change through a variety of areas such as science and geography.

We aim to achieve an increase in awareness of climate change both in terms of mitigation and adaptation, and also promote an understanding of what practical measures people can take to help Stockton reduce its carbon emissions and create a more resilient environment.

## 8.0 Climate Change Action Plan 2009 – 2012

### Domestic Sector:

**Objective 1: Improve the energy efficiency of housing in all sectors to create a 2% carbon reduction from domestic emissions by 2012.**

Key actions	Deadline	Responsible for delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
Promote insulation installation measures for all eligible and able to pay properties. Target take-up 2000 houses per year	March 2012	Stockton Borough Council	TADEA EAGA	<ul style="list-style-type: none"> <li>• 28% improvement at March 2008</li> <li>• 30% improvement at March 2009</li> <li>• Social housing stock will have average Sap rating of 65 by 2012</li> </ul>	Availability of grant funding	3-6 Low	
Targeted energy advice delivered to households.	March 2011	Stockton Borough Council	TADEA		Priorities for TADEA	5 Low	
Promote the use of energy monitors through the library loan scheme Target take-up 450 homes per year	March 2011	Stockton Borough Council			Apathy amongst householders.	5 Low	
Promote installation of 'A rated' heating systems in all homes. Target take-up 500 homes per year	March 2011	Stockton Borough Council	TADEA EAGA		Quality of data	8 Low	

TADEA = Tees and Durham Energy Advice, a service funded by the Energy Savings Trust (EST) and based in Billingham.

EAGA = Energy Action Grants Agency, the delivery mechanism for the government's warm front grants.

**Planning Policies:**

<b>Objective 2: Incorporate sustainability principles in all new housing developments by October 2009.</b>							
<b>Key actions</b>	<b>Deadline</b>	<b>Responsible for delivery</b>	<b>Partners</b>	<b>Success Criteria/Milestones</b>	<b>Risks</b>	<b>Risk Rating</b>	<b>Progress to date</b>
Develop a Residential Design Guide to provide guidance on standards for the design and layout and sustainability of new housing schemes.	May 2010	Stockton Borough Council	Developers	<ul style="list-style-type: none"> <li>All new developments to achieve the Eco-Homes rating of 'excellent' unless the developer can demonstrate that this would be impractical (subject to consultation)</li> </ul>	Legal challenges to policy. Government policies and drivers.	8-10 Low – Medium	
Adopt policies within the Core Strategy requiring new housing development to include energy efficiency measures and renewable energy generation.	May 2010	Stockton Borough Council	North East Assembly One NorthEast	<ul style="list-style-type: none"> <li>All commercial developments over 1000m2 and all residential developments of more than 10 dwellings to source 15% of predicted energy consumption from on-site renewables or district heating (2009-2012) and 25% by 2012-2016.</li> </ul>	Enforcement of policy.	8-10 Low – Medium	

**Transport:**

<b>Objective 3: Promote sustainable travel options throughout Stockton.</b>							
<b>Key actions</b>	<b>Deadline</b>	<b>Responsible for delivery</b>	<b>Partners</b>	<b>Success Criteria/Milestones</b>	<b>Risks</b>	<b>Risk Rating</b>	<b>Progress to date</b>
Implement 'Connect Tees Valley' Major Scheme (subject to funding being allocated)	March 2012	TVJSU	Bus operators/TVJSU/ Other Tees Valley Councils	<ul style="list-style-type: none"> <li>No reduction in access to healthcare and education facilities within the Borough between 2005/06 and 2010/11.</li> <li>Restrict overall decline in bus patronage within the Borough to 10% between 2005/06 and 2010/11.</li> <li>Increase passenger footfall at the Boroughs railway stations by 18% between 2004/05 and 2010/11.</li> <li>Incorporate cycle links to Eaglescliffe Station via Connect2</li> </ul>	Funding availability	15-20 Medium – High	
Work within the sub-region to develop a City Region Rail Partnership, which would include interchange at stations within its remit.	Ongoing from 2009	TVJSU	Train operating companies/Network Rail/Bus operators/TVJSU		Funding availability	15-20 Medium-High	
Review the operation of the Concessionary Fare Scheme to ensure provision beyond its existing term for 2009/10	2010/11	Stockton Borough Council	Other Tees Valley Councils		Funding availability	6 – 8 Low	
Develop a station travel plan for Thornaby station looking at improving access to/from the rail network.	Ongoing from 2009	Stockton Borough Council	Train operating companies/Network Rail/Bus operators/TVJSU		Commitment from all parties. Available resources.	6 – 8 Low	

**Active Travel:**

**Objective 4: Promote Cycling as an attractive alternative to the private car for journeys made within the Borough.**

Key actions	Deadline	Responsible for delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
4000 children to be given pedestrian and cycle safety training.	March 2012	Stockton Borough Council	Local schools/Sustrans	<ul style="list-style-type: none"> <li>All schools in the Borough to have an Authorised Travel Plan in place by 2010.</li> <li>50% increase in cycle trips recorded at automatic count sites located across the Borough between 2004/05 and 2010/11.</li> <li>Provide Sheffield stands at schools, libraries, hospitals, supermarkets and town centres, as a minimum provision.</li> </ul>	Available resources.	6 – 8 Low	
Provide secure cycle parking in town centre locations.	Ongoing from 2009	Stockton Borough Council	Sustrans		Available resources. Suitable sites not being available.	3 – 6 Low	
Work with local schools to develop School Travel Plans.	Ongoing from 2009	Stockton Borough Council	Local schools/Sustrans		Available resources.	3 – 6 Low	

**Waste Management:**

<b>Objective 5: Achieve 30% domestic waste recycling by 2010.</b>							
<b>Key actions</b>	<b>Deadline</b>	<b>Responsible for delivery</b>	<b>Partners</b>	<b>Success Criteria/Milestones</b>	<b>Risks</b>	<b>Risk Rating</b>	<b>Progress to date</b>
Provide green waste collection to 64,000 properties, target for composting green waste 12%	March 2012	Stockton Borough Council		<ul style="list-style-type: none"> <li>• Target for 2010 – 40% of household waste recycled</li> <li>• Minimum recycling targets will be set for all construction sites in their Site Waste Management Plans.</li> </ul>	Resources available.	12 – 15 Medium	
Minerals and Waste Core Strategy and Site Allocations DPDs to provide framework to encourage re-use, recovery and recycling activities (on commercial basis) and to identify suitable sites for these activities.	April 2010	Stockton Borough Council			Suitable sites being identified and business responses.	12 – 15 Medium	
Roll out collections of cardboards and plastics to all households	Oct 2009	Stockton Borough Council	J & B Recycling		Public reaction and participation.	12 – 15 Medium	

**Objective 6: Achieve 20% of households composting at home by 2010.**

Key actions	Deadline	Responsible for delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
Offer low cost home composting options to householders.	Ongoing from 2009	Stockton Borough Council	WRAP	<ul style="list-style-type: none"> <li>Waste education strategy developed.</li> <li>500 additional home composters in use by householders by 2010</li> </ul>	Saturation point reached. Funding from WRAP not available.	12 – 15 Medium	
Promote home composting through road shows and high profile events.	Ongoing from 2009	Stockton Borough Council	WRAP		Apathy, poor participation.	3 – 6 Low	
Develop waste education and communication strategy to promote recycling and encourage waste minimisation.	December 2009	Stockton Borough Council	WRAP		Sources available, changing priorities.	3 – 6 Low	



**Business Sector:**

<b>Objective 7: Engage local businesses to commit to action on climate change by 2012.</b>							
<b>Key actions</b>	<b>Deadline</b>	<b>Responsible for delivery</b>	<b>Partners</b>	<b>Success Criteria/Milestones</b>	<b>Risks</b>	<b>Risk Rating</b>	<b>Progress to date</b>
Promote action through existing networks such as chamber of commerce, Green Business Network local strategic partnership and key events and activities.	March 2012	Stockton Borough Council	Renew –CPI Environment Agency	<ul style="list-style-type: none"> <li>• Ten local businesses to have a travel plan in place by 2012</li> <li>• Ten businesses to engage on a low carbon supplier development project by 2010</li> </ul>	Apathy, changing priorities.	4 – 10 Low - Medium	
Engage local businesses on a Low Carbon Supplier Development Project – to promote a low carbon supply chain within Stockton	March 2012	Stockton Borough Council	Environment Agency, Renew-CPI				
All significant new development to provide suitable staff travel plan.	Ongoing from 2009	Stockton Borough Council				Challenges to planning conditions.	3 – 6 Low

**Objective 8: Raise awareness within the community of how they can reduce their impacts on Climate Change**

Key actions	Deadline	Responsible for delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
Develop a School's Awareness Programme	September 2009	Stockton Borough Council		<ul style="list-style-type: none"> <li>• 30 Schools actively engaged in Eco-schools programme</li> <li>• 20 Schools enrolled as Climate Change Lead Schools</li> <li>• Organise one Business Carbon Breakfast event per year.</li> </ul>	Commitment and resources from available partners	4-10 Low medium	
Raise Public Awareness and promote community engagement on climate change issues through the work of the urban and countryside rangers.	Ongoing from 2009	Stockton Borough Council	Tees Valley Wildlife Trust.		Commitment and resources from available partners	4-10 Low medium	
Work with businesses and small to medium enterprises to promote awareness of energy efficiency adaptation measures within the workplace, and	Ongoing from 2009	Stockton Borough Council	Business in the Community  Green Business Network		Apathy amongst business community. Commitment and resources from available partners	4-10 Low medium	
Promote awareness of climate change mitigation and adaptation through work-shops, road shows and publications.	Ongoing from 2009	Stockton Borough Council	Energy Savings Trust, Environment Agency, Department of Health		Commitment and resources from available partners	4-10 Low medium	

## Climate Change Adaptation – Action Plan 2009 - 2012

### Objective 1: Minimising Flood Risk in Stockton on Tees

Stockton Borough Council will lead on an integrated water management strategy, the main aims of which will be;

- To minimise flood risk within the Borough, from both tidal flooding from the River Tees and its tributaries and surface water flooding.
- To plan for any future impacts the changing climate may bring, to ensure that existing and newly built infrastructure, buildings and assets are well adapted to cope with future climate changes and extreme weather events.

The recommendations focusing on Local Authority responses to flooding resulting from the Pitt review will also be taken into account:

- Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.
- Local authorities should positively tackle local problems of flooding by working with all relevant parties, establishing ownership and legal responsibility.
- Local authorities should collate and map the main flood risk management and drainage assets (over and underground), including a record of their ownership and condition.
- Local Surface water management plans as set out under PPS25 and co-ordinated by local authorities should provide the basis for managing all local flood risk.

Objective 1 - Key Actions	Deadline	Responsible for Delivery	Partners	Success Criteria/Mile stones	Risks	Risk Rating	Progress to date
Review existing Sub Regional/Strategic Flood Risk Assessment (RFRA / SFRA) in line with revised Environment Agency legislation	2010/11	Stockton Borough Council	The Environment Agency Northumbrian Water	A revised Sub Regional/Strategic Flood Risk Assessment for Stockton on Tees is in place in line with new legislation from	Lack of clarity regarding ownership of surface water drainage.	8-10 Low - Medium	The draft Floods and Water Bill issued Spring 2009 – will clarify roles, responsibilities

				the Environment Agency	Lack of Resources  Growth Point Funding pending		and costs.
To plan to incorporate sustainable water management strategies for all planning for new developments within Flood Risk Zone 1.  (NB- All planning for new development in zones 2 & 3 is discouraged in line with SFRA and PPS25.)	2010/11	Stockton Borough Council	The Environment Agency.  Northumbrian Water	Water management strategies (SUDS or SWMP) are fully incorporated into planning procedures for new property on zone 1 to minimise the risk of surface water flooding within new developments.	Lack of clarity regarding ownership of surface water drainage.  The draft Floods and Water Bill issued Spring 2009 – will clarify roles, responsibilities and costs	8-10 Low - Medium	
Review the mapping database of all flood risk management assets (eg drains and culverts both over-ground and underground) and include a record of ownership and condition – in line with Pitt recommendations and the Transport Asset Management Plan	2010-11	Stockton Borough Council	The Environment Agency.  Northumbrian Water	Transport Asset Management Plan – TAMP in place	Lack of clarity over ownership of assets.	8-10 Low - Medium	Partially in place. Gullies currently mapped within the GIS database. All drains not yet incorporated.

Create mapping of all flood incidents across the borough- to highlight flood hot-spots.	2009-10	Stockton Borough Council	The Environment Agency	Database created to record all incidents of flooding in the Borough – to be updated on an ongoing basis	Lack of resources  A partial study already carried out by EA.	8-10 Low-Med	
Develop a programme of works to address surface water flooding hot-spot areas within the Borough.	2009/10 and ongoing	Stockton Borough Council	The Environment Agency.  Groundworks	All flooding hot-spots within the borough identified by 2010. Programme of works to be identified by 2011.	Lack of funding for flood alleviation and resilience work.  Proactive sourcing of funding streams.	8-10 Low - Medium	Flood alleviation works already started – <ul style="list-style-type: none"> <li>• Preston Park.</li> <li>• Wynard Woodland Park</li> <li>• Preston Farm.</li> </ul>
Review the on-going programme of improvements to bridges and culverts to ensure preparedness for River and surface water flooding	2011 – 12 and on going	Stockton Borough Council		Transport Asset Management Plan – TAMP in place, which incorporates a programme for addressing the effects of climate change and extreme weather on the transport system	Lack of clarity over ownership of assets.  Failure to actively revise the programme based on climate predictions.  Monitoring and Review process will take changing	8-10 low - medium	

					climate predictions into account		
<p>Revise the Asset Management Plan database to take into account flood or weather related maintenance issues - to create a maintenance programme which will :</p> <ul style="list-style-type: none"> <li>• Ensure that all public buildings, including schools, are adapted and maintained to withstand high intensity rain fall events.</li> <li>• Ensure that flood resilience and resistance measures are incorporated into all at risk Civic buildings, including schools.</li> </ul>	2010/11 and ongoing	Stockton Borough Council		<p>Asset Management Plan Database revised to include weather related maintenance issues – 2011/12.</p> <p>Revise maintenance programmes to include flood risk resilience and resistance measures – by 2011/12</p> <p>All at risk buildings have access to flood risk management and flood resilience planning and advice - 2011/12</p>	Financial pressures and lack of resource	15 – 20 Medium high	Housing Stock Condition Survey – currently out to tender – Dave Stamper

## **Objective 2: Adapting Stockton's Built Environment to improve resilience to a changing climate**

Stockton has a household population of approximately 275,400. Housing stock turnover is currently very low and it is estimated that the vast majority of current housing stock will still be in use for many decades to come. Much of the existing stock in Stockton has been built to the standard dictated by weather conditions of the time and as such will be particularly vulnerable to the changes in climate over this period – especially to extreme weather events such as flooding and heat wave events.

Planning legislation and guidance is currently in place to ensure new buildings come within a standard framework to ensure adaptation and energy efficiency. However, there is no such legislation to bring existing buildings within these standards. The Decent Homes Standard 2010, whereby all social housing should meet basic comfort standards, only tackles thermal comfort in terms of efficient heating and insulation, and not in terms of cooling.

By ensuring that adaptation measures are fully incorporated into measures resulting from current legislation Stockton Borough Council seeks to ensure that Stockton's built environment will be resilient to climate change over the coming decades. Adaptation should be integrated with carbon reduction measure to ensure that mitigation and adaptation takes place jointly to provide a robust and resilient stock.

### **Aims**

- **To ensure that buildings, roads, pathways and other structures and assets controlled or influenced by the Council are future proofed against climate changes bringing hotter weather and drier summers, milder, wetter winters and increasing frequent extreme weather events.**

### **Objectives**

- **To take into account the lifespan of new buildings and assets to ensure they are capable of coping adequately with any extremes of temperature likely to be experienced during that lifespan**
- **Successfully combine adaptation measures with carbon reduction strategies, to ensure that all new buildings are low impact, energy efficient and climate resilient.**
- **To assess existing buildings, roads, structures and assets to determine capability to cope with extremes of temperature during their expected lifespan.**

<p>To ensure <b>new</b> buildings are capable of coping adequately with any extremes of temperature likely to be experienced during their lifespan.</p>	<p>2010</p>	<p>Stockton Borough Council</p>		<p>Adaptation criteria embedded into planning stage for all new build properties.</p> <p>Environmental DPD Planning Policy Document in place.</p> <p>Sustainable Construction Policy developed and in place 2010</p>	<p>Changing priorities due to weak economic climate</p> <p>Opportunities to incorporate new technologies to meet future climate pressures</p>	<p>8-10 low-medium</p>	
<p>Review Asset Management Database to record climate related maintenance for all <b>existing</b> civic buildings to determine capacity to cope with extremes of temperature during their expected lifespan Create a timetable of works to begin to enhance resilience to climate change impacts and reduce incidents of mal-adaptation (eg use of air-con and electric fans).</p>	<p>2010/11 and ongoing</p> <p>2010/11 and ongoing</p>	<p>Stockton Borough Council</p> <p>Stockton Borough Council</p>		<p>Asset Management Database amended to record climate related maintenance.</p> <p>Programme of works to enhance resilience to climate change in place.</p> <p>Carbon Management Programme involved to prevent use of mal-adaptation methods.</p>	<p>Changing priorities due to weak economic climate.</p> <p>Lack of funds and resources</p>	<p>15-20 medium high</p>	



Ensure <b>new</b> roads, paths and cycle ways to ensure ability to cope with extremes of temperature or subsidence caused by extremes of temperature which may be experienced during their expected lifespan.	Ongoing from 2009/10	Stockton Borough Council		All new roads, paths and cycle ways to incorporate adaptation measure at the planning stage.  Environmental DPD Planning Policy Document in place	Changing priorities due to weak economic climate.  Lack of funds and resources	15-20 medium high	
Identify <b>existing</b> roads, paths and cycle ways needing modification to ensure they will cope with extremes of climate change during their remaining lifespan.	Ongoing from 2009/10	Stockton Borough Council		Transport Asset Management Plan produced 2009.	Lack of funds /resources	15-20 medium high	

**Objective 3: Managing and enhancing Stockton's green infrastructure to improve resilience to a changing climate**

Well-designed, flexible public spaces offer excellent opportunities to adapt to climate change threats. Spaces that are softer, greener, more organic and natural will store water and are critical to modifying urban temperatures. Trees in particular have valuable role to play in cooling the air, shading buildings in summer (helping with mitigation, cutting the need for ventilation and cooling) and capturing carbon.

Green spaces with a generous planting of trees link to form a network offering cooler, cleaner air.

The Biodiversity of Stockton's green spaces is threatened by heat-stress, drought, strong wind and gales

The development of Stockton Borough Council's Green Infrastructure Strategy assures a climate proof approach to green space planning, design and management.

**Aim**

- **To ensure that natural environment within Stockton Borough is adapted to cope with climate changes which may impact biodiversity.**

**Objectives**

- **To assess and maintain existing trees in the Borough to ensure they are healthy and sufficiently robust to cope with extreme weather events which may occur during their remaining life span.**
- **To create and maintain urban green spaces and trees which will promote building cooling and community cool areas without posing a threat to buildings and other structures during any extreme weather event which may occur during their lifespan.**

Key Actions	Deadline	Responsible for Delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
Incorporate measures to help increase the resilience of the natural environment to climate change into all strategies and plans relating to Council-owned countryside and greenspace, increasing adaptive capacity within the Borough	2009/10	Stockton Borough Council		Green Infrastructure Strategy produced 2009/10. Other management plans for parks, greenspaces and countryside sites incorporate appropriate, adaptation measures to maintain biodiversity.	Lack of funding / resources.  Skills gap		

<p>To create and maintain enhanced networks of urban greenspace, street trees and woodlands to moderate climate change impacts in urban areas, including provision of shade, reduced urban temperatures and reduced surface water run-off.</p> <ul style="list-style-type: none"> <li>• Develop a tree and planting programme to identify opportunities for new trees and woodlands</li> </ul>	2009/10	Stockton Borough Council		<p>Overall aim- minimum of 300 trees to be planted per annum, providing - Increased tree cover to moderate urban microclimate and provide greater degree of shading for buildings and areas of public realm. Increased tree cover and play spaces designed to reduce exposure to direct sunlight. Careful species selection in new plantings to withstand long term climate change effects.</p>	<p>Lack of funding / resources.</p> <p>Skills gap</p> <p>Use is being made of consultant expertise.</p> <p>Grant funding is being investigated via the Forestry Commission</p>		<p>All existing woodland areas in the Borough are currently being mapped.</p>
<p>To assess and maintain existing trees in the Borough to ensure they are healthy and sufficiently robust to cope with anticipated extreme weather events</p> <ul style="list-style-type: none"> <li>• Mapping of all existing woodland areas in the Borough to be carried out to aid assessing of the quality of existing wooded areas and identify potential areas for new planting.</li> </ul>	2009/10	Stockton Borough Council	Forestry Commission	<p>Adopt risk limitation measures for tree management, e.g. pruning cycles for trees in identified 'risk' areas,</p>	<p>Lack of funding / resources.</p> <p>Skills gap</p>		<p>External consultants have been engaged and mapping of woodland areas within the Borough is underway –</p>

#### Objective 4: Resilience Planning and Community Awareness Raising

Stockton Borough Council will support adaptation at two broad levels, both within its own operations and at community level:

**Building adaptive capacity** – creating the information and conditions (regulatory, institutional, managerial) that are needed to support adaptation, eg the incorporation of sustainable drainage measures within planning.

**Delivering adaptation actions** – taking steps that will help to reduce vulnerability to climate risks or to exploit opportunities. This may be as low cost and simple as installing blinds on south facing windows, to large scale flood resilience installations.

##### Aim

- To ensure that Stockton Borough Council's resilience planning fully represents the potential effects of climate change.
- To ensure that the community is fully aware of the potential impacts of climate change, and is also aware of their own responsibilities towards building personal resilience to those impacts.

##### Objectives

- To engage with the community to ensure awareness of potential impacts of extreme weather events, and advise how communities can reduce impacts to themselves and property.
- To engage with local businesses to ensure awareness of potential impacts of extreme weather events and advise how businesses can reduce impact to themselves and their property. (Pitt review recommendation 13).
- Enhance technical and workforce capabilities. To ensure that staff is equipped to respond adequately to extreme weather events and to undertake ongoing adaptation measures to ensure continuing service delivery, and minimise risk to life and impacts to buildings and infrastructure.
- To ensure that technology, and equipment used by the Council is robust, and adequate enough to deal with events arising from climate change or extreme weather events.

Key Actions	Deadline	Responsible for Delivery	Partners	Success Criteria/Milestones	Risks	Risk Rating	Progress to date
To ensure that the Council Plan contains a robust objective and developmental priority to deliver climate change adaptation actions across the Council.	2009/10	Stockton Borough Council		<p>The Council Plan was ratified on 25/03/09 and now contains an objective /development priority that relates directly to these issues:</p> <p>"Respond to climate change through carbon reduction and increased resilience to extreme weather events".</p>			Completed 2008/09

<p>To ensure that Stockton Borough Council's Corporate Business Continuity Plan, is fully fit for purpose and is able to respond to a wide variety of emergency situation including, those brought about by adverse weather events.</p>	<p>2009/10</p>	<p>Stockton Borough Council</p>			<p>Lack of senior management commitment.</p>	<p>2-6 Low Continued dialogue with Senior Management Team has ensured commitment and understanding of Adaptation requirements across all Service delivery.</p>	
<p>To ensure that individual Business Continuity Plans for all service areas are fully fit for purpose and are able to respond to a wide variety of emergency situations including those brought about by adverse weather events.</p>	<p>2009/10</p>			<p>Further embedding of climate change resilience within individual service business plans to be reviewed during 2009/10.</p>	<p>Lack of Management Commitment</p>	<p>2-6 - Low Continued dialogue with Senior Management Team has ensured commitment and understanding of Adaptation requirements across all Service delivery.</p>	<p>Development and Neighbourhood Services BCP to be reviewed March 2009. Work will be done with the Council's other Service Depts and partners throughout 2009/10 to ensure that adapting to climate change is included in their BCP's and other relevant plans.</p>

Service Improvement Plans are updated to reflect potential impacts of climate change and extreme weather.	2010/11	Stockton Borough Council		Further embedding of climate change resilience within Service Improvement Plans will be ongoing across the Council.	Lack of Head of Service Commitment	2-6 - Low Continued dialogue and involvement has ensured commitment.	
To ensure the contact centre is capable of dealing with enquiries from the public during, or after, major flooding.	2009/10	Stockton Borough Council	Emergency Planning	Emergency procedures in response to flooding are in place.	Skills gap	2-6 low	
Enhance technical and workforce capabilities – to address skills gap in flood risk management and climate resilience.	2009/10 and ongoing	Stockton Borough Council	Arups Environment Agency	1 member of staff attending Flood Risk Management course	Funding / resources	12-15 medium	
Engage with local business and industry to ensure adaptation measures are embedded within business plans and that sufficient attention has been paid to the need for resilience measures.	2009/10	Stockton Borough Council	Business in the Community – Climate Change Business advisor	'Carbon Breakfast' workshop events held for local business to access information on mitigation and adaptation. 20 local businesses engaged within 2009/10  Create a simple toolkit of resources for local businesses and partners to use in booklet and website format – 2009/10	Apathy – poor reception from small businesses in current economic climate	12-15 medium	

<p>To provide assistance and advice to Local Strategic Partners to ensure robust flood resilience and climate change adaptation across the Borough.</p>	<p>2009 and ongoing</p>	<p>Stockton Borough Council</p>	<p>Environment Partnership.  Stockton Renaissance  Tees Valley Climate Change Partnership</p>	<p>Continued collaboration with LSP partners within the Borough.  Collaboration with Tees Valley Climate Change Partnership to produce Tees Valley wide response to climate change.</p>	<p>Lack of resources / funding</p>	<p>2-6 low</p>	
<p>To ensure that staff are aware of the potential impacts of climate change and extreme weather events on their work-place and are also aware of their own responsibilities towards building resilience to those impacts.</p>	<p>2009/10</p>	<p>Stockton Borough Council</p>		<p>Staff are aware of the Council's management plans for adverse weather.  Stockton Borough Council's Carbon Champions incorporate adaptation as well mitigation within their local awareness raising.</p>	<p>Lack of knowledge.  Regular contact and updates with Carbon Champions will ensure awareness of issues.</p>	<p>2-6 low</p>	



Community Awareness Raising							
To ensure that the community is fully aware of the potential impacts of all climate change, and extreme weather events and is also aware of their own responsibilities towards building personal resilience to those impacts.	2009/10	Stockton Borough Council	Environment Agency, Emergency Planning.	<p>An awareness raising media campaign is launched in local papers during 2009.</p> <p>An information booklet launched 2009.</p> <p>Information point on Council Website – 2009</p>	<p>Apathy – poor reception from community</p> <p>Panic and over reaction from owners of property in flood risk areas.</p>	12.-15 medium	
To promote uptake of flood warning action plans issued by the Environment Agency	2009/10	Stockton Borough Council	Environment Agency, Emergency Planning.	<p>An awareness raising media campaign is launched in local papers during 2009.</p> <p>An information booklet launched 2009.</p> <p>Information point on Council Website - 2009.</p>	<p>Apathy – poor reception from community</p> <p>Panic and over reaction from owners of property in flood risk areas.</p>	12.-15 medium	
To promote and encourage the use of the Heat Wave action plans within the community.	2009/10	Department of Health Emergency Planning.	Stockton Borough Council	<p>An awareness raising media campaign is launched in local papers during 2009.</p> <p>An information booklet launched 2009.</p> <p>Information point on Council Website – 2009</p>	Apathy – poor reception from community	12-15 medium	

Monitoring and Review							
Develop a monitoring and review system to ensure continued assessment of assets for resistance and resilience to all potential climate change threats to ensure that Stockton Borough Council's resilience planning fully addresses the potential effects of climate change.	2010-11	Stockton Borough Council			Changes to Indicator criteria  Lack of clarity over future climate impacts	2-6 Low  Continued working with Agencies and local Partners to ensure up to date information and strategic approach is maintained.	

## **9.0 Implementation and monitoring**

The action plan aims to reduce emissions by 21% by 2020 and prepare the Borough for the impacts of climate change. The plan will therefore provides actions that will be delivered over the next 3 years, with interim targets being set for 2012. It will be subject to annual review, where new data will enable trends to be further analysed and actions updated as required.

Monitoring the success of the action plan will be against achievements in reducing emissions as well as the successful implementation of individual actions and the impact that they have made where that is possible to measure.

Progress on the action plan will be reported to the environment partnership, corporate management team, cabinet and Tees Valley Climate Change Partnership (TVCCP). Reports will also be published on the Council web site.

## 10.0 Glossary

**Adaptation** – A concept that refers to decisions to modify natural or human systems in response to actual or expected global warming that cannot be avoided by emissions reductions

**Carbon dioxide (CO<sub>2</sub>)** – A naturally occurring gas: also a by-product of burning fossil fuels and biomass as well as land-use changes and other industrial processes. It is the principal human derived greenhouse gas that affects that earth's temperature.

**Carbon dioxide equivalent (CO<sub>2</sub>e)** – A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

**Carbon Trust** – A government funded independent company, helps business and the public sector cut carbon emissions, and supports the development of low carbon technologies.

**Combined Heat and Power (CHP)** – a fuel-efficient energy technology that, unlike conventional forms of power generation, puts to use the by-product heat that is normally wasted to the environment.

**DTI** – The Department of Trade and Industry is the government department responsible for trade and industrial matters.

**EMS** - A management approach which enables an organization to identify, monitor and control its environmental aspects. An EMS is part of the overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.

**Energy Saving Trust** – A non-profit organisation, funded by the government and private sector, which provides expert and impartial advice and information to encourage the more efficient use of energy in homes and vehicles across UK.

**Greenhouse gases (GHGs)** – Gases in the earth's atmosphere that absorb infrared radiation. These gases occur through both natural and human-influenced processes. Other primary human-produced GHGs include carbon dioxide, nitrous oxide, methane, ozone, and chlorofluorocarbons.

**Kyoto Protocol** – The protocol drafted during the Berlin mandate process that, on entry into force, would require countries listed in its Annex B (developed nations\_ to meet differentiated reduction

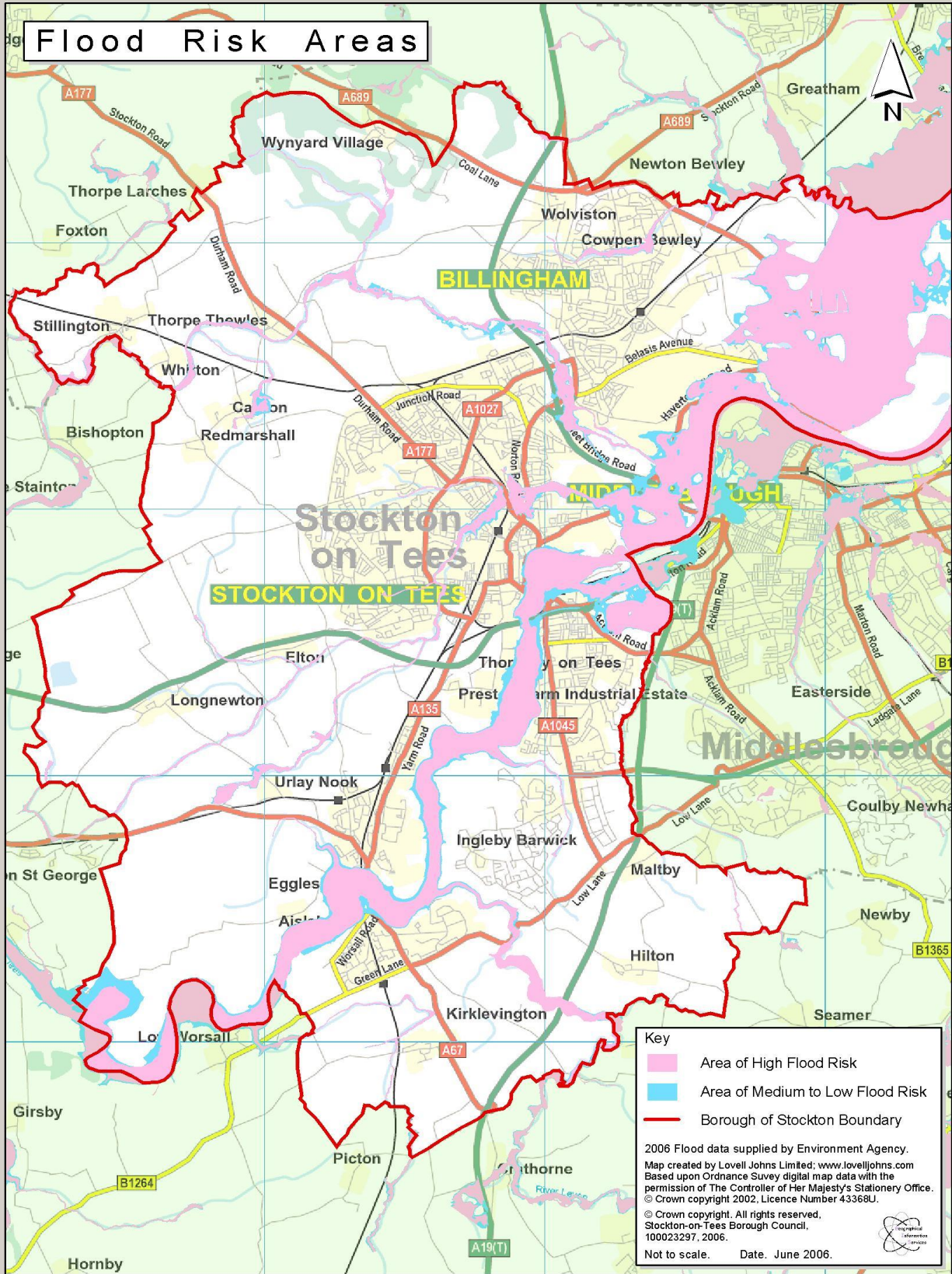
targets for their emissions of a basket of GHGs relative to 1990 levels by 2008-12. It was adopted by all parties to the Climate Convention in Kyoto in December 1997.

**Local Development Framework** – A new system of local development planning which will include several Development Plan Documents (DPDs) and a number of Supplementary Planning Documents (SPDs).

**Mitigation** - Actions which are adopted to reduce the effects of human activities on the global climate.

**Sustainable urban drainage (SUD)** - Techniques for dealing with problems of flooding and surface water quality using the best practicable environmental solution.

**UK Climate Impact Programme (UKCIP)** – UKCIP is funded by the Department for Environment, Food & Rural Affairs (Defra) and based at the University of Oxford. It provides scenarios that show how our climate might change and co-ordinates research on dealing with our future climate.



12.0 Partners in this Action Plan



