Tees Valley unlimited

Tees Valley Climate Change Strategy

2010 - 2020

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Foreword

"I am delighted to present the Tees Valley Climate Change Strategy. The Coalition Government has made it very clear that it believes climate change is one of the gravest threats we face, and that urgent action to reduce carbon emissions is needed. The Tees Valley Local Authorities and partners have long since recognised this threat and continue to implement a series of measures to address it.

Tees Valley represents a unique blend of industrial, urban and rural areas and climate change represents a real threat, especially to our carbon emitting industries, however the assets, skills and experience we have also mean that we are well placed to maximise the opportunities presented by the transition to a Low Carbon economy. This transition will safeguard the industries and jobs we have, attract new inward investment and support the creation of new green jobs and technologies leading to a stronger and more diverse economy.

This strategy represents the "coming together" of the five Tees Valley local authorities and their partners with a single aim and vision. Climate change does not respect administrative boundaries and only by working together within the Tees Valley and with the new government can we overcome the threats and make the most of the opportunities.

Moving forwards, this strategy provides a sound base to embed the Low Carbon transition within the economic regeneration of the Tees Valley and the overall economic recovery of the country."

John Barton

Project Director, Renew@CPI and Chair of the Tees Valley Climate Change Partnership

Statements Of Support

"Climate change is a big issue for society and although there is as yet no certainty over the causal effects or the outcomes, it is likely to arise from both natural and human processes. Analysis of potential causes and planning for the future is essential so that large scale interventions are possible. To have a positive impact it may mean that small improvement activities by the many, for example changes we make in all our homes and modes of transport, will be needed, alongside large scale investments such as renewable fuels, renewable heat and power and renewable chemicals. Clearly climate change can only be tackled by a concerted effort by us all and this strategy shows we have the partnership approach in the Tees Valley that can play its full part."

Dr Stan Higgins, CEO, NEPIC

"I welcome the initiative taken by the Tees Valley Climate Change Partnership in producing this climate change strategy and applaud the ambitions to reduce carbon emissions from Tees Valley, work towards a low carbon economy and to plan for the impacts of climate change. The Environment Agency looks forward to playing its part in helping to achieve these aims through its work in regulating emissions from industry, supporting the development of low carbon technologies and managing flood risk".

Mark Scott, Area Manager - Environment Agency North East Area

NHS Tees is delighted to be part of the Tees Valley Climate Change Partnership. Our business is improving the health of local people, but we also carefully consider the impact of all that we do on the global community. We are committed to taking action on climate change. NHS Tees has established a strong sustainable development strategy to ensure that we take seriously our responsibilities as a local partner, meet our national NHS commitments to carbon reduction and encourage and support our staff to make positive changes at work and at home to help deliver our collective vision for healthy, low carbon lifestyles.

NHS Tees

"Darlington Borough Council recognises that climate change is occurring and is committed to securing local action in tackling this important issue. Working in partnership with other key organizations within the Tees Valley will ensure a co-ordinated and effective approach to both mitigating and adapting to the effects of climate change. This strategy represents an innovative approach to joint working across the Tees Valley and is a clear statement of the commitment to combating climate change."

Councillor Nick Wallis, Cabinet Member for Sustainable Environment and Climate Change, Darlington Borough Council

"Climate change is happening now, and poses a major threat to our future, both locally and globally. Hartlepool Borough Council fully supports the Tees Valley Climate Change Strategy, and is committed to tackling the causes of climate change by taking action to reduce CO_2 emissions across the borough. We all have a responsibility to reduce our CO_2 emissions and to ensure we are prepared for the inevitable effects of climate change, and the Council is working to ensure that these effects are considered and addressed in all aspects of its services. The Hartlepool Climate Change Working Group, which has representation from major stakeholders within the town, has produced a local Implementation Plan for action on climate change within the borough. This document will be further developed and reviewed by the Working Group to ensure that Hartlepool's response to climate change is comprehensive and wide reaching and engages all areas of the community. By working together, the people of Hartlepool can rise to the challenges laid down by climate change, and I urge every person to do their bit at home, at work and at leisure".

Stuart Drummond, Mayor of Hartlepool

Middlesbrough launched its first Climate Change Community Action Plan in 2004 to provide an agreed framework to reduce carbon dioxide emissions and plan how the local community will adapt to the inevitable changes in the weather brought about by climate change. The Action Plan was the foundation behind Middlesbrough Council's Beacon Council status for 'Tackling Climate Change' which I was pleased to see was a partnership bid involving Tees Valley Councils. Leaders around the world are increasingly signing up to far reaching cuts in carbon emissions but it is widely accepted that the challenge must be led at the local level if progress is to be made. Middlesbrough Council is committed to working with the local community to make Middlesbrough a more sustainable town and meet our commitments under the Covenant of Mayors. Our branding for sustainability is called 'One Planet Living' and working towards zero carbon and zero waste is a long term goal. Everyone has to play a part in working towards a low carbon future. This document shows how the Tees Valley has come together, not just in leading the way in reducing greenhouse gas emissions, but in being at the forefront in creating new green jobs.

Ray Mallon, Mayor of Middlesbrough

"Redcar and Cleveland Borough Council acknowledges the threat posed by climate change and the response that needs to be taken by the Council, its partners and citizens of the borough. As a coastal borough, we take the threat seriously and recognise the importance of mitigation through reducing our emissions but equally of the need to adapt to the changes that will take place. We fully support this collaborative and comprehensive Tees Valley Climate Change Strategy and wholeheartedly endorse its aims. As a signatory of the European Covenant of Mayors Initiative, climate change is one of the key priority areas within 'Our Plan', the Councils corporate plan, and the boroughs Sustainable Community Strategy. We are committed to working with our partners across the sub region to ensure we deliver on this important agenda including meeting the challenging targets we set ourselves.

Councillor George Dunning, Leader of Redcar and Cleveland Borough Council

"Stockton Borough Council has taken a pro-active approach to tackling the issues of climate change, and we take seriously the threats posed to our industry, homes and environment by a changing climate. We have publically pledged to reduce our emissions and make adapting to the challenges of climate change one of our top priorities. We also recognise the importance of strengthening our efforts by working together across the Tees Valley. We fully endorse the Tees Valley Climate Change Strategy and the opportunities it presents to the communities of the Tees Valley in its approach to tackling climate change."

Councillor Jennie Beaumont, Cabinet Member for the Environment, Stockton on Tees Borough Council

"Creating prosperous and resilient communities in a low-carbon economy"

Background

The Tees Valley is a unique economic and cultural area of the North East of England that includes the five unitary boroughs of Darlington, Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton-on-Tees. The Tees Valley economy includes the largest integrated heavy industrial complex in the United Kingdom. Climate change creates unparalleled opportunities as well as risks for the Tees Valley. Developing renewable energy and low carbon industry, upgrading public transport systems and low carbon, resilient housing developments are clear priorities for the economic development of the Tees Valley.

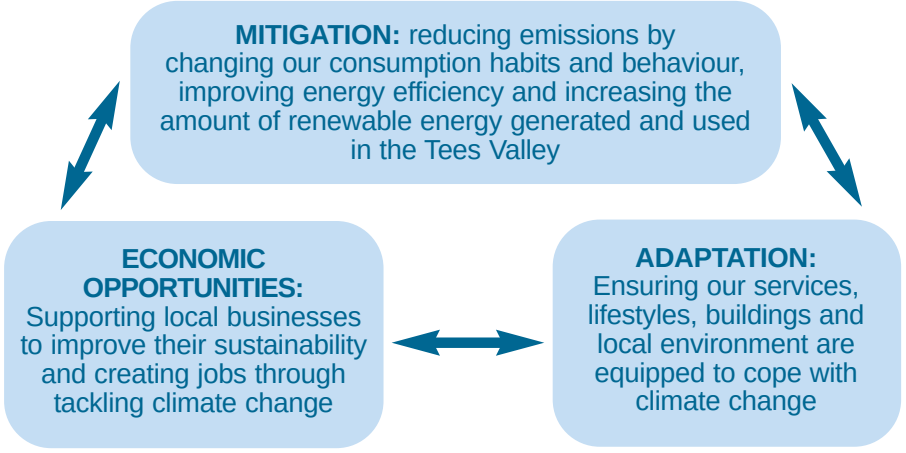
A coherent and targeted approach is needed to engage and support the range of people and organisations that impact, and are impacted by climate change in the Tees Valley.

This includes identifying opportunities to reduce the carbon emissions associated with existing heavy industry, for example, using low grade waste heat from industry to provide heating for new housing developments.

The North East was designated as a Low Carbon Economic Area to develop ultra low carbon vehicles in 2009, and the North South Tees Industrial Development Framework for the Tees Valley has been developed to support the range of low carbon sectors that currently plan to invest in the area. Climate change is central to the Tees Valley Unlimited Economic & Regeneration Statement of Ambition as it is essential that the economic regeneration of the Tees Valley does not 'lock in' to a high carbon infrastructure. We need to ensure that emissions reductions in one sector are not dwarfed by rising emissions in other sectors.

The economic downturn has created significant risks and challenges for businesses and the public sector. Widespread restructuring is occurring throughout all sectors. Climate change impacts and longer term rising energy prices increase the vulnerability of many organisations, unless a proactive response ensures that risks are minimised and opportunities are exploited to the full. For example, rising energy costs, and costs of carbon emissions through market mechanisms may reduce profit margins, but action to improve energy efficiency can reduce these costs, as well as reducing emissions.

Similarly, if climate risks are embedded into contingency planning, recovery from extreme events such as floods is likely to be much quicker. In line with the Climate Change Action Plan for the North East, our approach to tackling climate change focuses on mitigation, adaptation, and economic opportunities.



A key challenge in investing in climate change during a recession is that people may view climate change as a 'feel good' issue that is less important than economic development. It is therefore crucial to point out that action on climate change is more about 'insuring' than 'taxing' economic development. In 2006 the Stern Review concluded the costs of dealing with climate change in the future far outweigh the costs of tackling climate change now.

"The investment that takes place in the next 10-20 years will have a profound effect on the climate in the second half of this century and in the next. Our actions now and over the coming decades could create risks of major disruption to economic and social activity, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century. And it will be difficult or impossible to reverse these changes…

…Action on climate change will also create significant business opportunities, as new markets are created in low-carbon energy technologies and other low-carbon goods and services. These markets could grow to be worth hundreds of billions of dollars each year, and employment in these sectors will expand accordingly...

…The world does not need to choose between averting climate change and promoting growth and development. Changes in energy technologies and in the structure of economies have created opportunities to decouple growth from greenhouse gas emissions. Indeed, ignoring climate change will eventually damage economic growth.[1]"

Climate change is something that we cannot afford to ignore. The impacts and implications of climate change will be a positive driver of economic growth in the Tees Valley, and a proactive response to the challenges of climate change now will increase our ability to cope with negative impacts in the longer term.

Similarly, the urgent need to reduce emissions associated with lifestyles offers a huge opportunity to support people in making healthy and prudent behaviour changes for the better.

It is vital to properly support people to make healthier and more sustainable choices, to allow us to 'lock in' to healthy low carbon lifestyles, for example by providing suitable incentives such as safe cycle routes and supervised school cycle clubs or walking buses. This will make people more active, and less reliant on high carbon lifestyles.

Tackling the commercial and the lifestyle aspects of climate change will allow us to realise our vision of creating prosperous and resilient communities in a low carbon economy. Tackling climate change means reducing fuel poverty, reducing the impacts of flooding and high energy prices, promoting healthy and active lifestyles, and taking advantage of the economic and employment opportunities associated with renewable energy and low carbon businesses.

This vision is fully aligned with the priorities contained in the Tees Valley Statement of Ambition and Multi Area Agreement, as well as the Sustainable Community Strategies of the Tees Valley Authorities and Local Strategic Partnerships. We are committed to ensuring that the opportunities as well as the risks associated with climate change are recognised and acted upon together.

The Tees Valley Climate Change Partnership

The Tees Valley Authorities have a long history of working together and are recognised as leaders in tackling climate change. The Tees Valley Climate Change Partnership was formally established in 2005 and includes the five Tees Valley Local Authorities, the Environment Agency, Renew@CPI, Tees and Durham Energy Advice Centre (TADEA) and the Energy Savings Trust. The Clean Environment Management Centre (CLEMANCE) of Teesside University, and the Tees Valley Primary Care Trusts joined the partnership in 2009.

The key achievements of the partnership to date include:

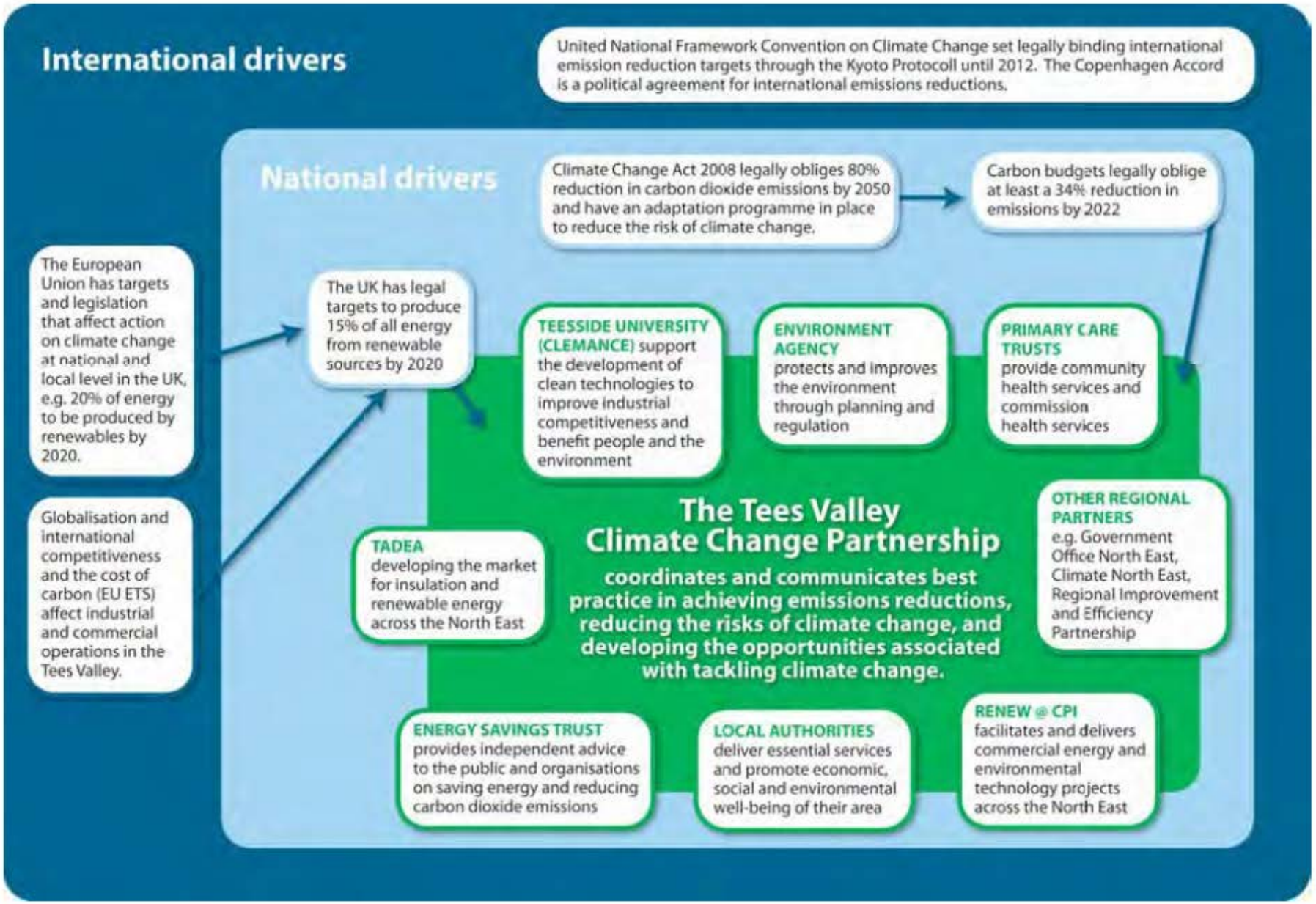
- Developing a Tees Valley greenhouse gas inventory and emissions protocol to monitor emissions throughout the sub-region.
- Publishing a Tees Valley climate change strategy in 2007 that set an emissions baseline and outlined actions to achieve emission reductions, adapt to climate change and raise awareness; and
- Adopting Tees Valley wide targets for emissions reductions the Tees Valley Local Authorities committed to reducing emissions by at least 8.75% by 2012.
- Middlesbrough Council was awarded Beacon Status by the Government in 2008, therefore the Tees Valley Climate Change Partnership were Beacon Partners.

The current Tees Valley baseline and targets have been revised to take account of Local Area Agreement targets, and we are committed to working towards emissions reductions in line with the UK carbon budgets and Covenant of Mayors Commitments.

All of the Local Authorities in the North East have signed up to the Covenant of Mayors initiative, which commits them to reduce emissions in their local area by at least 20% by 2020.

Actions and measures to meet Local Strategic Partnership targets will deliver our short term priorities and are based on existing Local Authority Climate Change Action plans and Local Area Agreements. Medium term objectives up to 2020 will be achieved by making climate change central to the economic regeneration priorities contained in the Tees Valley Unlimited Statement of Ambition, for example developing low carbon infrastructure.

There is a legal obligation for the UK to reduce carbon emissions by 80% by 2050, so this will guide our medium to long term plans. At the moment, our economy and our lifestyles directly and indirectly rely upon the availability of fossil fuels, so meeting long term targets and our vision will demand substantial changes to our economy and way of life. We still have the opportunity to ensure this is a positive transition.


International drivers
United National Framework Convention on Climate Change set legally binding international emission reduction targets through the Kyoto Protocoll until 2012. The Copenhagen Accord is a political agreement for international emissions reductions.
National drivers
Climate Change Act 2008 legally obliges 80% reduction in carbon dioxide emissions by 2050 and have an adaptation programme in place to reduce the risk of climate change.
Carbon budgets legally oblige at least a 34% reduction in emissions by 2022
The European Union has targets and legislation that affect action on climate change at national and local level in the UK, e.g. 20% of energy to be produced by renewables by 2020.
The UK has legal targets to produce 15% of all energy from renewable sources by 2020
TEESSIDE UNIVERSITY (CLEMANCE) support the development of clean technologies to improve industrial competitiveness and benefit people and the environment
ENVIRONMENT AGENCY protects and improves the environment through planning and regulation
PRIMARY CARE TRUSTS provide community health services and commission health services
Globalisation and international competitiveness and the cost of carbon (EU ETS) affect industrial and commercial operations in the Tees Valley.
TADEA developing the market for insulation and renewable energy across the North East
The Tees Valley Climate Change Partnership
coordinates and communicates best practice in achieving emissions reductions, reducing the risks of climate change, and developing the opportunities associated with tackling climate change.
OTHER REGIONAL PARTNERS e.g. Government Office North East, Climate North East, Regional Improvement and Efficiency Partnership
ENERGY SAVINGS TRUST provides independent advice to the public and organisations on saving energy and reducing carbon dioxide emissions
LOCAL AUTHORITIES deliver essential services and promote economic, social and environmental well-being of their area
RENEW @ CPI facilitates and delivers commercial energy and environmental technology projects across the North East

Climate Change in the Tees Valley

The North East Adaptation Study identified future climate change impacts in the Tees Valley that relate mainly to industry, urban areas, transport and services. The low-lying nature of much of the Tees Valley means we are susceptible to direct climate change impacts such as rising sea levels and flooding, which will impact homes, businesses and the coastal and wetland habitats of the Teesmouth and North Tees Valley marshes.

The Tees Valley chemical process industry, and Hartlepool Nuclear Power Station, is located around the banks of the River Tees estuary. These are prone to overtopping and flooding unless adequate flood defence structures and bunds are developed and maintained. Rising sea levels will increase the risk of flooding to key industrial sites. The Environment Agency has developed a Tees Tidal flood risk management strategy to address flood risk issues between the mouth of the Tees and the A66 road crossing, an area of approximately 65 km^2. Most of this area is heavily industrialised, though some of the Tees Tidal area is designated under European legislation because of its importance to birdlife.

One of the key recommendations of the Pitt Review "Learning Lessons from the 2007 Floods" is that local authorities take on the leadership role in flood risk management. This includes:

- Coordinating mapping of local surface flood risk.
- Managing surface water flooding and drainage at local level.
- Stronger planning and building controls.
- Reviewing reserves and insurance to ensure they are able to bear the cost of recovery in future emergencies.

Since 2006 all public bodies and local authorities have a duty to conserve biodiversity.

Identifying potential risks enables us to plan to reduce the risks and increase the opportunities associated with a changing climate. Durham County Council is currently developing a methodology to produce vulnerability maps as a UK CIP pilot. Tees Valley may be able to use this methodology for cross boundary adaptation planning.

Understanding our existing vulnerability is a useful starting point to consider the future impacts of climate change for the Tees Valley, for example the Transporter Bridge, the largest working bridge of its kind in the world, is closed to vehicles during high wind speeds, intense rainfall events or heavy fog. The A19 flyover is closed to high sided vehicles during heavy wind. By 2050 the transport network will become increasingly affected by weather-related impacts causing disruption and delays in road, rail and air traffic. Increased winter flooding and, road tarmac melt during rising summer temperatures will increase disruption.

Opportunities to start building resilience to climate change impacts are identified in the strategic priority sections, drawing on the North East Adaptation Study and other best practice.

Adapting to climate change

Adaptation to climate change means reducing the risks and taking advantage of the opportunities associated with a changing climate.

The climate change impacts that we can expect in the North East by 2050 include:

- Increased flooding from rivers, streams, the sea and drainage systems.
- Increased health and welfare effects during warmer summers, such as excess deaths due to heat waves, increases in infectious diseases in humans and livestock, and increasing injury to children playing out.
- Increased numbers of pests.
- Increased damage to the structure of buildings and transport networks.
- Loss of business/service productivity or continuity.
- Increased pressure on emergency services and disruption to services e.g. meals on wheels, particularly during floods.
- Increased erosion of the coastline and sea level rise.
- Changing residential settlement patterns and migration.

During the 2003 heat wave, there were 35,000 extra deaths across Europe because we were not prepared for high temperatures and had not effectively planned how we could deal with them . The UK floods in 2007 cost the lives of 13 people, and over £3 billion in insurance with around 48,000 homes and 7,000 businesses flooded. The impacts of climate change will become more severe over time, and it is important that we adapt our lifestyles, businesses and infrastructure to cope with these impacts today and build in resilience to climate impacts for the future.

Climate Change policy context

Action on climate change is governed by international and national laws and policies. The policy context for action on climate change is outlined on www.teesvalleyunlimited.gov.uk. UK action on climate change falls under the Climate Change Act 2008. This Act means that the UK is the first country in the world to introduce a legally binding framework to cut greenhouse gas emissions.

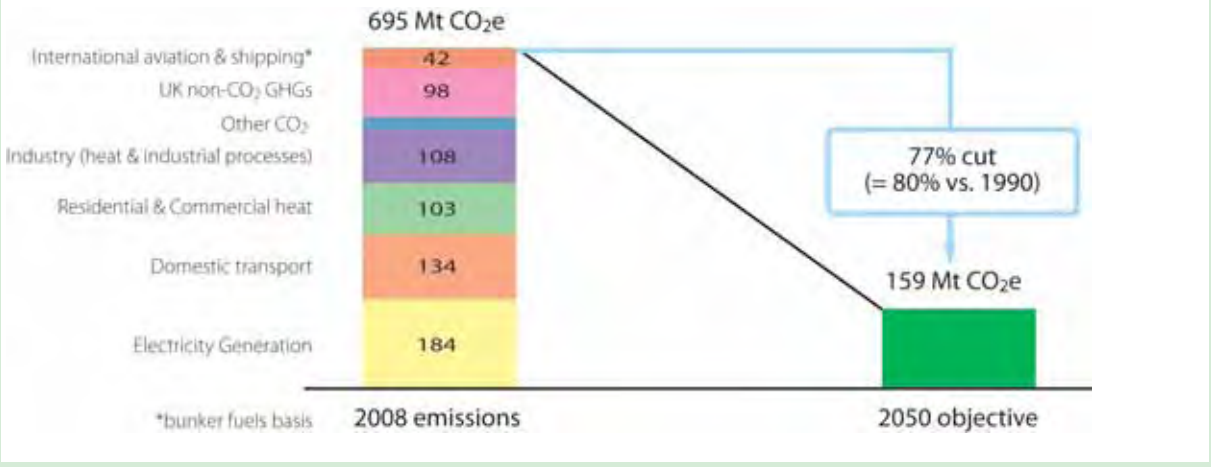
The Act created the Committee on Climate Change - an independent expert body to advise the government on how to achieve carbon savings. The Committee on Climate Change has an Adaptation Sub-Committee to provide advice and scrutinise government work on adaptation. The Committee on Climate Change published their first report in December 2008, which supported the UK Government's target to reduce emissions of greenhouse gases by 80% by 2050 as a fair contribution to global action on climate change. The Government has a duty to meet this target through setting 5 year carbon budgets which require emissions reductions of at least 34% by 2020 from a 1990 baseline.

Climate change mitigation

Climate change mitigation means reducing the amount of greenhouse gases that are released into the atmosphere to reduce their role in warming the global climate. Greenhouse gases are released when fossil fuels such as coal, oil, and gas are used to generate heat and electricity, and when oil is used to power transport engines. Tropical deforestation is another major cause of greenhouse gas emissions, because of huge releases of carbon dioxide resulting from land use changes. Mitigation also includes increasing the amount of greenhouse gases that are absorbed naturally by vegetation, soils and water.

Carbon dioxide CO_2 is the most significant greenhouse gas in the UK and the measurement of greenhouse gases are often described in relation to their carbon dioxide equivalent CO_2e. In this strategy we have used the term 'carbon emissions' as shorthand for 'carbon dioxide emissions'.

The scale of the challenge



(2008, Committee on Climate Change)

The emissions reductions the UK has legally committed to reflect our historical responsibility for climate change and our capacity to put things right.

The Government has to report every 5 years on the risks posed by climate change to the UK, and publish a programme of adaptation to address these risks.

The Committee on Climate Change has prioritised options for reducing carbon emissions in the UK. The key areas where reductions are most easily achieved are energy efficiency improvements in buildings and industry, and reducing the use of fossil fuels in power generation, transport, and industry. In line with the Stern Report (2006), the Committee on Climate Change concluded that the costs of achieving these reductions are much less than the costs and consequences of inaction.

The Coalition Programme for Government published in May 2010 states that the Government will:

- Continue public sector investment in carbon capture and storage (CCS) technology for four coal-fired power stations. They have also stated that they will establish an emissions performance standard that will prevent coal-fired power stations being built unless they are equipped with sufficient carbon capture and

storage to meet the emissions performance standard, that a floor price for carbon will be introduced, and that they will make efforts to persuade the EU to move to full auctioning of EU ETS[2] permits.

- Create a green investment bank, and as part of the creation of a green investment bank, create green financial products to provide individuals with opportunities to invest in the infrastructure needed to support the new green economy.
- Establish a smart grid and roll out smart meters.
- Establish a full system of feed-in tariffs in electricity - as well as the maintenance of banded Renewables Obligation Certificates.
- Introduce measures to promote a huge increase in energy from waste through anaerobic digestion and introduce measures to encourage marine energy.
- Through a 'Green Deal', encourage home energy efficiency improvements paid for by savings from energy bills. There will also be measures to improve energy efficiency in businesses and public sector buildings. The government have also made a commitment to reduce central government carbon emissions by 10% within 12 months.
- Deliver an offshore electricity grid in order to support the development of a new generation of offshore wind power.
- Encourage community-owned renewable energy schemes where local people benefit from the power produced. The Government will also allow communities that host renewable energy projects to keep the additional business rates they generate.
- Work towards an ambitious global climate deal that will limit emissions and explore the creation of new international sources of funding for the purpose of climate change adaptation and mitigation.

This national policy framework supports the Tees Valley Statement of Ambition to drive the transition to a high value low carbon economy. Within the Statement of Ambition, the North South Tees Industrial Framework details significant investment projects that currently exist, barriers that need to be overcome, and the actions required to deliver a low carbon economy in the Tees Valley. The principle sectors and technologies targeted include:

- Decarbonising industry
- Low carbon energy using biomass, waste and industrial by-products
- Resource recovery that recovers value from 'waste' resources
- Biofuels and biotechnology to produce low carbon fuels and feedstock for the chemicals sector
- Advanced engineering and manufacturing

In addition to the Tees Valley Statement of Ambition, every local authority in the North East has signed up to the Covenant of Mayors, making the North East the first region in Europe to do so. The Covenant of Mayors and Leaders is an ambitious European initiative that seeks to bring together the Mayors of some of Europe's pioneering cities in a permanent network to exchange and apply good practices to improve their energy efficiency and promote low-carbon business and economic development.

The Covenant of Mayors is a commitment by Mayors to go beyond the carbon reduction targets set by the EU for 2020 by reducing CO_2 emissions in local territories by at least 20%. The Covenant also requires that each signatory submits a Sustainable Energy Action Plan (SEAP), including a baseline emission inventory, to outline how carbon reduction objectives will be reached, within one year of signing up to the initiative.

The Tees Valley climate change strategy prioritises actions where immediate, substantial and measurable emissions reductions can be achieved alongside the North South Tees Industrial Development Framework and the Covenant of Mayors initiative. These actions support the vision of the Tees Valley Climate Change Partnership, the strategic priorities of the Multi Area Agreement and the Local Area Agreements that direct the Tees Valley Local Strategic Partnerships. The strategy is based on existing best practice in tackling climate change across the city region and will be used to ensure climate change remains central to the programmes developed to implement the Tees Valley Statement of Ambition.

The Tees Valley Emissions Baseline

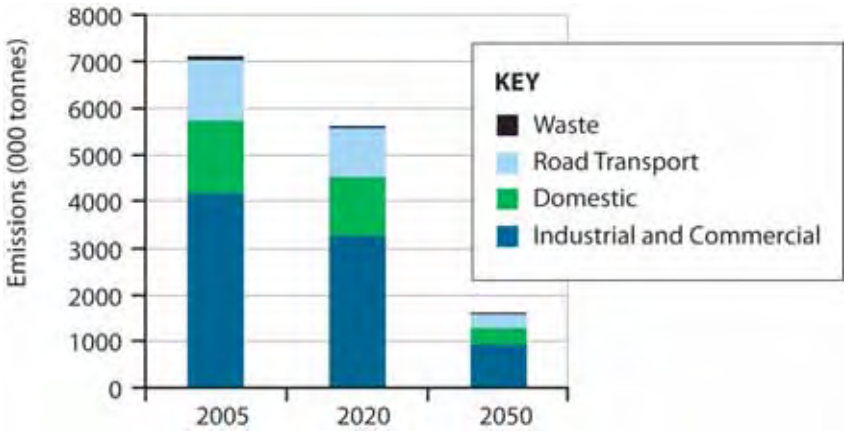
Since 2008, National Performance indicators have governed local authority action on climate change; specifically NI 185 that covers the emissions from local authority operations, NI 186 that covers emissions in the local area, and NI 188 that covers adapting to climate change. The aim of NI 186 is to measure and provide a framework to reduce CO_2 emissions that originate from business and public sector, domestic housing, and road transport in the local area. This indicator uses national statistics, and the percentage change in CO_2 emissions per capita is reported annually by the Department for Energy and Climate Change (DECC).

The Tees Valley Climate Change Partnership revised the existing emissions protocol to use NI 186 data as a baseline for emissions reduction, though we will also continue to include and monitor the emissions associated with municipal waste disposal. This is because the emissions from waste directly relate to lifestyles in the Tees Valley, and robust and nationally comparable data exist for all local authorities. We will also develop and report on additional key climate change indicators.

A significant proportion of emissions from Tees Valley are not included in reporting under NI 186 because they are regulated by the European Union Emissions Trading Scheme (EU ETS), and NI 186 also does not include emissions from aviation or shipping. The Tees Valley Multi Area Agreement (MAA) includes an indicator called M7 that measures the carbon intensity of production from the emissions that are not included in the NI 186 data. This means that the carbon emissions per unit of production are reported, rather than the actual total emissions from each company. This will show whether companies are improving their efficiency. Currently the M7 indicator includes the major emitters that are regulated under the EU ETS, and will be expanded to cover energy production, biofuels, aviation, shipping, and retail. We will include the M7 indicator as part of our reporting on key climate change indicators for the Tees Valley. In addition to the M7 indicator, the North South Tees Industrial Development Framework will reduce emissions that are not reported under NI 186.

The scope of NI 186 does not cover most of the emissions that are associated with general consumption patterns, for example, the emissions generated in producing and transporting the things that we buy every day. These 'hidden' emissions are significant. Stockton-on-Tees Borough Council commissioned a study to work out their total carbon footprint[3]. The study concluded that direct emissions relating to energy used to heat Council buildings and transport fuel accounted for 29% of emissions, but the majority, 71%, are indirect emissions as a result of electricity use and procurement of goods and services. We have used data from the Stockholm Environment Institute Resource and Energy Analysis Programme to highlight emissions associated with consumption patterns within the Tees Valley.

The Tees Valley 2005 Baseline (000 tonnes of CO_2e)



DECC, 2007

The scale of the challenge

The Tees Valley baseline for 2005 was 7125 kT CO_2e, including emissions from waste, but excluding emissions regulated under the EU Emissions Trading Scheme.

By 2007, the total emissions had reduced to 6815 kT CO_2e. This reflects a 5% (217 kT) reduction in commercial, industrial and public sector emissions, an almost 4% (58 kT) reduction in domestic energy emissions, a reduction in road transport emissions of around 1.5% (17kT) and waste emissions rose by 34% (19 kT), and a reduction in emissions from waste disposal of around 28% (17 kT) due to increasing recycling.

However, because the closure of industrial plants results in huge emissions savings, there is a danger that this will disguise other trends such as increasing road transport emissions. We have therefore chosen to use sector targets - rather than an overall reduction target - for emissions reductions in order to clearly demonstrate where we are making progress on tackling climate change.

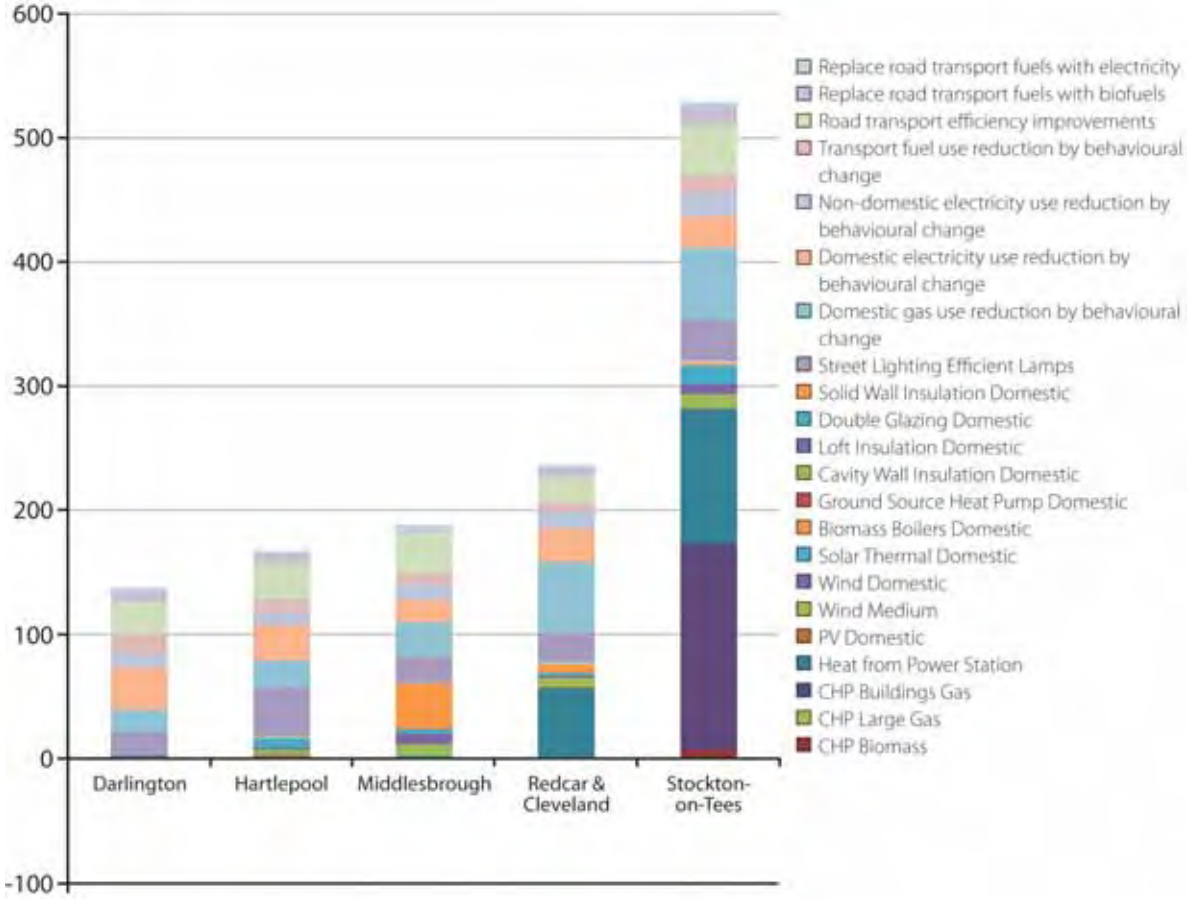
The total Tees Valley emissions are much higher than our baseline shows. Including emissions regulated under the EU ETS, aviation, shipping, land use, land use changes and forestry (LULUCF) brings the total Tees Valley emissions to just over 20,000 kT CO_2e in 2005. This figure may have to reduce below 4,000 kT CO_2e by 2050 to comply with the UK target of a reduction of 80% from 1990 levels (this equates to 77% reduction from 2005 levels).

The North East Greenhouse Gas Emissions Study (2008) concluded that CO_2e emissions from industry are by far the biggest source of regional emissions, now and in the future. This is especially true for the Tees Valley city region. The report also points out that despite significant reductions in domestic emissions, there is likely to be an increase by 2050 due to population growth, and projected growth in transport emissions.

The North East Greenhouse Gas Emissions Study concluded that a 'business as usual' approach to reducing carbon emissions will not deliver anywhere near the savings needed to meet local and national targets.

In this case, 'Business as Usual' means that if we carry on tackling climate change the way we are now, then we will not achieve the huge reductions that are needed to meet our targets. We need to achieve reductions that take into account the rising emissions due to population growth and transport trends.

Tees Valley projected target reductions by 2020



A software tool called Vantage Point has been used by all the North East Local Authorities to model the emissions reductions necessary to meet their commitments under the Covenant of Mayors - to reduce emissions by at least 20% by 2020. This graph shows the initial reduction figures generated by Vantage Point for 28 measures that could reduce carbon emissions in the Tees Valley. The final Sustainable Energy Action Plans, to be submitted in October 2010 will further refine these figures, and the Vantage Point tool will be refined to disaggregate specific actions such as boiler replacements (which are currently included in 'behavioural change' figures).

There is a clear opportunity to coordinate these major schemes across the Tees Valley to achieve maximum benefit for the city region.

Carbon dioxide emissions reduced by almost 10% between 2008-2009 in the UK due mainly to the recession, as the downscaling and closure of businesses led to substantial emissions reductions[4].

However, these emissions 'reductions' do not reflect the long term position, and the first report of the Committee on Climate Change has warned that emissions will rise once economic growth begins. The North South Tees Industrial Development Framework will exploit existing opportunities to develop a truly low carbon infrastructure now, in order to effectively 'lock in' a transition to a sustainable Tees Valley economy with far lower emissions. This is at the heart of creating prosperous and resilient communities in a low carbon economy.

Opportunities

Over £4 billion in low carbon investments are already planned for the city region, and the Tees Valley Statement of Ambition identifies further opportunities based on the existing assets of the area. Developing a range of low carbon technologies in the Tees Valley will create at least 2,000 highly skilled jobs, 11,500 construction jobs, and 4,000 indirect jobs in the medium term. This will enable the export of skills and technologies worldwide, and help to shape a global transition to a low carbon and sustainable future.

The principal low carbon opportunities in the Tees Valley include carbon capture and storage, decarbonising energy production, improving resource efficiency, biotechnology and biofuels, and advanced engineering and manufacturing. There are also real opportunities to regenerate housing and improve public transport. These opportunities are all key priorities for emissions reduction identified by the Committee on Climate Change.

The Eston Grange proposals for coal fired electricity generation with carbon capture and storage, together with increases in biomass and offshore wind power generation mean the Tees Valley could produce well over 5000MW of low carbon energy. Producing low carbon energy in the Tees Valley will support heavy industry to invest in the area, reduce the cost burden of EU Emissions Trading Scheme and provide low carbon electricity to be exported to the national grid. Public transport investment proposals support a transition to low carbon economy and promoting active travel has major health benefits. Specific opportunities within each of the strategic priority areas have been identified below.

Strategic priorities

Improving the economic performance of the Tees Valley is based on two core ambitions:

- Driving the transition to a high value low carbon economy and;
- Creating a more diversified and inclusive economy.

The Tees Valley Climate Change Partnership vision of 'creating prosperous and resilient communities in a low-carbon economy' is fully coherent with these ambitions. Making climate change central to the economic regeneration of the Tees Valley is a pre-requisite for sustainable economic growth and improving the competitiveness and liveability of the city region.

This strategy outlines the climate change implications associated with the economic regeneration of the Tees Valley by building upon the framework for climate change action planning developed by the Northumberland Strategic Partnership[5].

The key climate change considerations for the economic regeneration of the Tees Valley have been considered in the following strategic priorities:

- Business
- Housing
- Transport
- Our local environment
- Communication and awareness raising

Opportunities to link to employment and skills are outlined in the strategic priority areas and contained in more detail in the North South Tees Industrial Development Framework and the Tees Valley Statement of Ambition.

Business

Where we need to be

All organisations in the Tees Valley have access to low carbon energy, operate with improved resource efficiency, are resilient to, or protected from, climate change impacts, and have taken full advantage of the economic opportunities associated with climate change.

Background

The energy, resources, chemicals and process industries are vital to the Tees Valley economy. The North South Tees Industrial Development Framework for the Tees Valley demonstrates how the city region can exploit the range of opportunities associated with developing sustainable low carbon industries. For example, the Eston Grange proposal to build an 850 MW coal fired power station that uses pre-combustion carbon capture and storage; developing more resources based industries, and improving integration between businesses and communities all offer significant economic benefit as well as major emissions reductions.

The UK's largest biomass fed power station and wood recycling facility is located in Redcar and Cleveland and there are plans to develop several major biomass plants in the city region. The North East Process Industries Cluster (NEPIC) support Northeast Biofuels to supply the local and global market and attract major international investment in sustainable biofuels in the area.

A number of organisations in the Tees Valley actively support the development of low carbon industry. NEPIC is a member owned company that represents the process industry in the North East and has a reputation for delivering projects that enhance the sustainability of the process industry sector. The award-winning Centre for Process Innovation promotes the development of near-market-ready technologies and processes, and has recently expanded their National Industrial Biotechnology Facility. Renew@CPI delivers near-to market industrial/commercial projects in sustainable energy and environmental technologies that will contribute to the North East economy and increase our national and international reputation.

Teesside University plays a major role in business support through knowledge transfer partnerships, and in delivering consultancy and training to employers. CLEMANCE is the environmental research centre for Teesside University and provides clean technology solutions to local business and industry. CLEMANCE also provides the technical support for the Green Business Network and is the regional lead on the National Industrial Symbiosis Programme (NISP). Industrial symbiosis works on the principle that waste from one organisation becomes feedstock for another. This saves operational costs while diverting material from landfill and reducing carbon emissions. A local example of this is the Billingham based John Baarda company who grow all year round tomatoes in greenhouses that use waste heat and carbon dioxide from local industry[6].

The South Tees Eco-Park (STEP) will be a cluster of businesses operating to industrial symbiosis principles - interdependent links between raw materials, water use, waste and energy requirements of the firms based there. On the North Tees, there is a world-class hazardous waste treatment facility, including soil washing that contributes to the remediation of formerly industrial land in the area. In addition to heavy industry, the Tees Valley Climate Change Partnership will support and work with the wide range of organisations in the city region to address the challenges faced and the opportunities presented by climate change.

Vulnerabilities

The North East Adaptation study concluded that in the North East, businesses have difficulty identifying their vulnerability to climate change, particularly in understanding the difference between adapting to climate change and mitigating - reducing their emissions.

"Barriers to change exist because climate change signals are difficult to recognise and will often require responses that run differently to established routines, timeframes, company culture and customer expectations. Where planning horizons are short responsive strategies can work well, but lack of long term perspective leads to sub-optimal decisions in the long term, creeping costs and missed opportunities.[7]"

The study points out that not all climate impacts are direct, and that organisations need to think about indirect impacts, for instance almost all businesses affected by the summer floods of 2007 suffered direct losses to stock and equipment, but in addition staff were unable to operate normally either due to failure of transport systems, loss of power, or communications. Indirect impacts can result in lost orders and enquiries, and the loss or damage of paperwork can result in problems with insurance claims, lost orders and filling in tax returns. Extended indirect impacts have disproportionate effects on smaller businesses as many businesses underestimate how long it will take to recover from a major flood event and many don't have business continuity insurance.

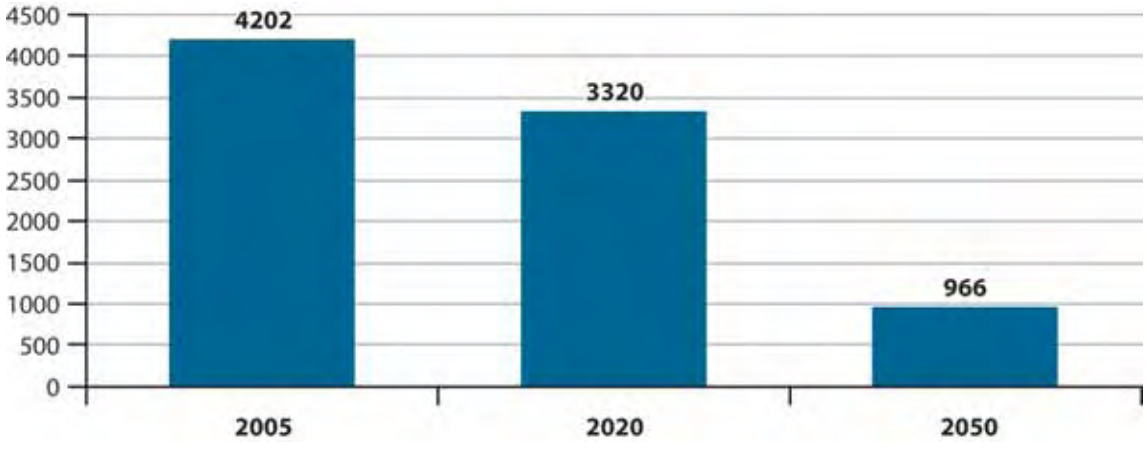
Much of the heavy industry in the Tees Valley is subject to the increasing costs associated with regulating greenhouse gas emissions through the EU ETS. There is a delicate balance between reducing the carbon emissions from an organisation and in encouraging heavy industry to remain in the UK. It is true that emissions will reduce in the Tees Valley if the existing industry closes down or relocates to a different country. However, this is not a 'true' reduction in emissions, because once the recession is over, we anticipate production will increase again, and if a company has relocated its production to a different country, then there may be a net increase in global emissions since the UK's regulation is amongst the most stringent in the world. Therefore it is vital to support the Tees Valley industry to manage climate change to prevent the 'export' of emissions. Developing carbon capture and storage infrastructure, increasing the availability of low carbon energy for heavy industry, improving industrial symbiosis and developing non-fossil fuel based feedstock and fuels are all vital to support the existing industry as well as encourage investments. The World Trade Organisation and the United Nations Environment Programme have reviewed how trade and climate change policies interact and how they can be mutually supportive[8].

Organisational culture may be a key issue for businesses in the Tees Valley. It is important that all employees are engaged and given responsibility for 'dealing with' climate change, otherwise it is likely that behaviour and attitudes will undermine action. Even the best schemes can fail if employees don't see the point of measures developed to minimise climate change impact.

Emissions protocol and targets

The commercial and industrial emissions from the Tees Valley in 2005 were 4202 kT CO_2e. Commercial and industrial emissions under NI 186 include public sector buildings and exclude the emissions regulated by the EU ETS. The chart below shows the 21% emissions reduction target for the industrial and commercial sector (which includes public sector buildings) by 2020[9].

Industrial and Commercial Emissions (000 tonnes) of CO_2e



In line with the UK carbon budgets and the recommendations of the Committee on Climate Change, we have agreed to work towards an emissions reduction target of 34% from 1990 levels. This implies a 21% reduction from 2005 levels, so that by 2020, commercial and industrial emissions in the Tees Valley should not exceed 3320 kT CO_2e. This target also supports the commitment made by all the Tees Valley Local Authorities to go beyond the European commitment to reduce emissions by at least 20% through signing the Covenant of Mayors. Ultimately, commercial and industrial emissions may have to reduce to 966 kT CO_2e by 2050 in line with the UK target reduction of 80% from 1990 levels (which equates to 77% from 2005 levels).

We have excluded the emissions regulated by the EU ETS in our target for two reasons. Firstly, they are included in the M7 indicator for the Tees Valley Multi Area Agreement and targets to improve the carbon intensity of production will be developed through this indicator. Secondly, the North South Tees Industrial Development Framework explicitly focuses on supporting major industry to exploit low carbon opportunities.

We will review and revise our targets to reflect level of reductions to be made by different regions and sectors when further guidance is provided by the Government and the Committee on Climate Change.

The carbon footprint of commercial and industrial organisations in the Tees Valley

The emissions associated with wider consumption patterns are included in the carbon footprint, based on data provided by the Resource and Energy Analysis Programme (REAP) developed by the Stockholm Environment Institute. The small footprint shows what proportion of commercial and industrial emissions are currently included in the Tees Valley emissions baseline. These account for only 65% of total commercial and industrial emissions. The big footprint also includes the 'hidden' emissions, for example the emissions regulated by the EU ETS, services such as water and sewage and the emissions arising from the manufacture of office equipment.

Mitigation

The Committee on Climate Change estimate emissions from energy use in non-residential buildings and industry in the UK could be reduced by around 47 Million tonnes of CO_2 ($MtCO_2$), of which 11 $MtCO_2$ will not cost anything or will actually save money in the long term. In addition, up to 2 $MtCO_2$ can be saved by using renewable heat and micro generation.

Information Communication Technology (ICT) data centres account for 2-3% of UK emissions - which is comparable to the UK's emissions from aviation. However, ICT can also be used to increase energy efficiency and reduce emissions in other sectors, such as transport, logistics, and manufacturing - for example using video conferencing rather than flying staff around the world for meetings. It is also possible to reduce the emissions associated with ICT through technology improvements and behaviour - such as turning off equipment when it is not in use[10].

Climate change will influence the way in which all businesses operate in the Tees Valley. The Tees Valley Green Business Network communicates the schemes and initiatives available to support businesses and the public sector in a straightforward and coherent way.

The Green Business Network Award Scheme recognises the work being done by local businesses to improve their resource efficiency, and provides them with the opportunity to develop and monitor improvements in their sustainability.

The UK is one of the few countries likely to exceed its Kyoto Protocol commitment, mainly as a result of changes in the energy market, fuel switching away from coal, and reduced demand from a shrinking industrial sector[11]. This basically means that we have 'exported' our emissions from manufacturing to other countries and now we import these products, rather than actually reducing our emissions in absolute terms[12].

Currently, approximately 18 organisations in the Tees Valley are subject to the EU ETS. We are fully commits to supporting industry to remain in the sub-region, and will work closely with partners to support maximum resource efficiency and sustainability within the business community.

North East Biofuels are developing and improving the value chain for sustainable biofuels in the Tees Valley, supported by NEPIC and Renew@CPI. Up to 35% of locally grown wheat could be used for biofuel production. By products from biofuel production (Dried Distillers Grain Solubles - DDGS) can be used for either biomass power production, or animal feed. If the DDGS is used for animal feed, then it displaces the import of equivalent quantities of soya products for both biofuel production and the soya imported for animal feeds. Sustainable biofuel production can reduce the emissions associated with peat land degradation, deforestation and transportation of soy products to the UK, as well as reducing the emissions associated with the UK's fuel consumption. Locally produced and consumed biofuels have a key role to play in mitigating climate change.

Opportunities

The Tees Valley is a potential carbon capture and storage demonstration site. Creation of a CO_2 capture utility for the Tees Valley will also dramatically reduce our emissions, because of the opportunities to capture carbon from a large number of industrial point sources in the area.

One of the key areas for economic growth in the Tees Valley lies in better resources management and in extracting the value from 'waste'. There are huge opportunities to develop low carbon industries that recover value from 'waste' and improve symbiosis between existing Tees Valley industries and technologies. There are also significant opportunities in the manufacturing and services associated with renewable energy, biofuels and biotechnology sectors.

Beyond the North South Tees Industrial Development Framework, there is a need to engage with and support all businesses, including small and medium sized enterprises to improve their resource efficiency, and help them to take advantage of the opportunities associated with climate change.

Tackling climate change can create new jobs and industries in the Tees Valley. Public sector strategies and plans to tackle climate change all provide opportunities for a substantial increase in jobs, particularly around the installation and maintenance of renewable energy, improving the energy efficiency of buildings, and managing the business risks of climate change. This will reduce future costs to organisations, increasing the attractiveness, competitiveness and sustainability of the Tees Valley sub-region in the medium to long term. As well as improving public sector buildings, local authorities will drive energy efficiency and renewable energy technology installation through the planning system and this will also help to develop local low carbon supply chains.

Public sector organisations can support low carbon supply chains through their procurement practices for example in purchasing low carbon technologies and locally produced sustainable biofuels.

Building Resilience

The industry located around the River Tees estuary is at risk from flooding especially from the North Sea. It is important to manage flood risk strategically, that is long-term and sustainably across the entire estuary. Particular regard should be given to climate change and its consequences such as sea level rise due to ice melt and thermal expansion of the oceans.

Local authorities have a responsibility to:

- Identify the vulnerability of critical public infrastructure (electricity, gas, water supply, sewage works, telecommunications, transport, schools) and produce plans for their protection from flooding. Many organisations in the Tees Valley are reliant on constant power supply. The risks to infrastructure need to be considered across organisations because systems are only as strong as their weakest link - which may be another organisation or operator.
- Maintain protection of important industries with specific defenses and bunding to reduce local flood risk. This is dealt with through the Tees Tidal flood risk strategy.
- Relocate key industries/businesses and critical/vulnerable properties away from potential flood risk where it is inappropriate or unsustainable to provide defenses.
- Continue tightly controlling developments allowable within the flood plain corridor.
- Ensuring compensatory habitat is developed where necessary.

In the public sector, local authorities will factor climate change into their service planning, and spatial planning systems, and work closely with Local Resilience Forums to mainstream climate change impacts into community risk registers. For example, health services should anticipate increased admittances during summer months due to heat-related conditions, illnesses and injuries.

The Tees Tidal Flood Risk Management Strategy follows a robust and sustainable approach to flood risk management over the next 100 years in the estuary. The indicative cost to implement the strategy is approximately £100 million. This estimate consists mainly of capital expenditure associated with improving flood defenses over the coming 25 years.

A smaller proportion will be spent on the operation and maintenance of the structures to maximise their lifespan. The cost of damages with and without implementation of the strategy in place has been assessed, and the damages that can be avoided to afflicted business and people are estimated to be £900 million.

Beyond flood risk, successful longer term adaptation to climate change requires that businesses and the public sector:

- Recognise and act on opportunities and threats from an early stage.
- Identify appropriate, proportionate responses.
- Modify systems, structures, skill sets, and financing to support and embed change into company routine.
- Review and feedback experience into the change process.

One of the main tools available to businesses to minimise the impact of climate change is Business Continuity Management. Business Link has developed a guide to support small businesses to develop crisis management and business continuity management systems. The Green Business Network, the Energy Savings Trust, the NISP, Business Link and the North East Regional Adaptation Business Advisor all offer free and impartial advice and services to Tees Valley businesses to help them to manage the risks of climate change. The Carbon Trust works with organisations to help them identify, manage and reduce their carbon emissions. The Waste and Resources Action Programme (WRAP) support and improve waste prevention, collection, recycling for a wide range of organisations. The Green Business Network provides a one stop shop to help local organisations contact the most appropriate source of help, so we will promote the Green Business Network to organisations in the Tees Valley.

Contact details are included in the 'Key Contacts' section and on www.teesvalleyunlimited.gov.uk.

Actions

The North South Tees Industrial Development Framework will drive a transition to a high value low carbon economy. In addition to this we will:

- Lead by example in improving the energy efficiency and resilience of the buildings we are responsible for, and install low carbon technologies in our own buildings wherever we can. Good practice will be shared and promoted across the Tees Valley.
- Drive energy efficiency and the use of renewable energy through the planning system. This will help to create local jobs in insulation, energy efficiency, renewable energy, and adapting buildings.
- Help businesses to adapt to climate change.
- Promote sustainability through public sector procurement processes.
- Encourage and support businesses in the Tees Valley to improve their resource efficiency, adapt to climate change and reduce their emissions through free advice and the Green Business Network Environmental Award Scheme.

Housing

Where we need to be

All homes in the Tees Valley are insulated to the best possible standards, and are resilient to impacts such as flooding and heat waves. New homes are designed to maximum possible sustainability standards. Communities and new developments have taken advantage of opportunities for power micro generation and/or district heating.

Background

The objective of the Tees Valley Growth Point Programme is to provide high quality private sector housing in town centres which supports economic regeneration as well as reducing the carbon footprint of the area by building low energy homes, improving public transport links and connecting new energy developments to new housing areas. Tees Valley Growth Point Programme of Development plans for 5000 dwellings to be cleared by 2020, with the remaining properties improved to bring them up to 21st century standards.

National Energy Action calculated that almost 30% of people in the North East region are living in fuel poverty[13]. The North East Home Insulation Partnership profiled insulation potential throughout the sub-region, and estimated that homes in the Tees Valley have approximately 91,000 unfilled cavities and 145,000 lofts that have inadequate levels of loft insulation[14]. The initial results from the Vantage Point software indicates that over 50,000 lofts, 49,000 cavity walls, and over 18,000 solid wall properties require insulation in the Tees Valley. Meeting this challenge will help us to meet our emissions reductions targets as well reduce fuel poverty and therefore improve people's quality of life.

Small late 19th century and early 20th century terraced housing made up over 31% of the stock in the city region though there have been approximately 2500 demolitions since 2006[15]. Taking into account the economic downturn, the revised housing projections in the Growth Point Programme of Development intends to reach 2670 net additional dwellings per annum by 2017/2018. However, this accounts for less than 0.33% renewal of the housing stock every year - providing a clear case for retrofitting the existing building stock to the highest possible thermal efficiency standards and also to account for adaptation priorities such as low carbon cooling systems and resilience to floods.

The Covenant of Mayors initiative requires the development of Sustainable Energy Action Plans for each of the local authorities who have signed up. The implementation of the Tees Valley SEAPs by each of the Local Authorities presents the opportunity to strengthen joint working, including joint procurement of services and products to accelerate the installation of insulation measures, and increase the uptake of home energy efficiency measures and renewable energy technologies by householders.

Vulnerabilities

Approximately 80% of homes in the Tees Valley are owner occupied or privately rented which creates particular challenges in improving the energy efficiency and resilience of properties. This is because privately owned or rented houses are usually treated on a case by case basis, whereas programmes to improve social housing are more straightforward to implement. Regardless of tenure, it is important to ensure that future rising costs of energy do not result in households, particularly vulnerable households, being unable to sufficiently heat or cool their homes. This can be monitored by comparing domestic energy consumption against degree days to ensure that emissions reductions are not gained at the expense of comfort and health in the home.

Despite vital and ongoing investment in tackling fuel poverty by improving the energy efficiency of homes, increasing energy use from household appliances may cancel out the emissions reductions achieved. There is a real need for a sustained public engagement campaign to reduce the emissions associated with household appliances. A review of over 500 studies on energy consumption by the UK Energy Research Centre[16] demonstrates that 'energy savings' from improved energy efficiency generally fall short of their technical potential. Improving energy efficiency can even lead to increased energy consumption, for example, if fuel is cheaper, you may drive further, or if your home is better insulated, you may choose to have a warmer home rather than reduce consumption. This is called the rebound effect.

By 2020 it is projected that consumer electronic products, combined with information communication technology equipment, will make up 45 per cent of all appliance related electricity use in the home[17]. These trends in increasing appliance use may offset the emissions reductions achieved by insulating homes to their maximum thermal potential. Therefore awareness raising and behavioural change are essential for achieving actual reductions in emissions from housing.

In terms of adaptation, much of the housing stock in the sub-region may be adversely affected by climate change, with increases expected in terms of both damp and pests, particularly in older and harder to treat properties[18].

Other impacts include:

- Increased damage to building fabric and structure of buildings and transport networks.
- Increased frequency of flooding from rivers, streams, the sea and drainage systems.
- Increased health and welfare effects during warmer summers, including increases in infectious diseases in humans and livestock, and increasing numbers of pests.

Major weather events such as flooding can increase levels of social deprivation. It is often poorer households, who may not be insured, that suffer disproportionately, and it is the most vulnerable people such as the elderly who are most affected during heat waves.

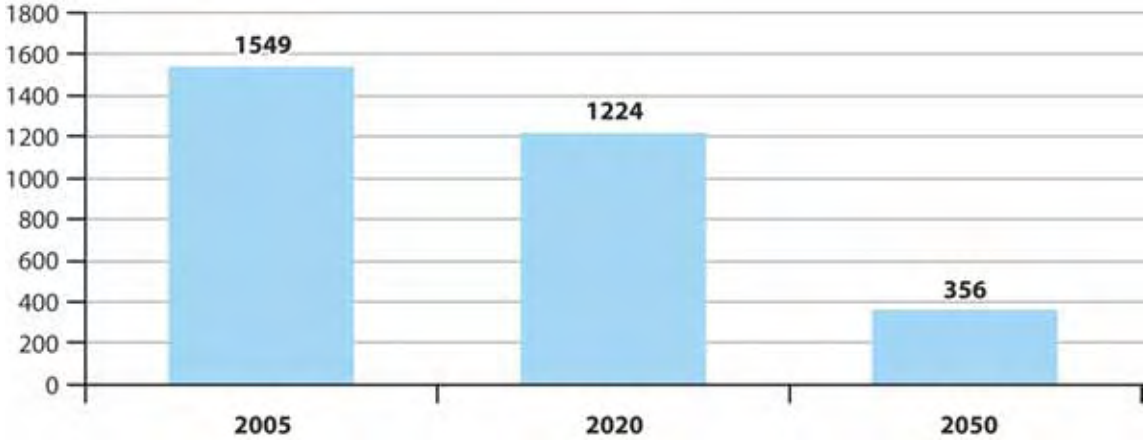
If the trends towards an ageing population continue, there will be an increased demand for social and welfare services, and increased vulnerability to climate change impacts such as heatwaves and flooding. Social service provision may become increasingly affected by climate change, such as more frequent flooding blocking access routes.

After a flood event, it is vital that affected structures are retro-fitted to increase their resilience, for example, by raising ground level electrical sockets and improving surface drainage, to reduce the impact and costs associated with future events.

Emissions protocol and targets

Domestic emissions from the Tees Valley in 2005 were 1549 kT CO_2e. The chart below shows the 21% emissions reduction target for the housing sector by 2020[19].

Domestic Emissions (000 tonnes of CO_2e



This target also supports the commitment made by all the Tees Valley Local Authorities to go beyond the European commitment to reduce emissions by at least 20% through signing the Covenant of Mayors.

In line with the UK carbon budgets and the recommendations of the Committee on Climate Change, we have agreed to work towards the interim emissions reduction target of 34% from 1990 levels. This implies a 21% reduction from 2005 levels, which means that by 2020, domestic emissions in the Tees Valley should not exceed 1224 kT CO_2e.

Ultimately, domestic emissions may have to reduce to 356 kT CO_2e by 2050 to fulfil the UK target reduction of 80% from 1990 levels (which equates to 77% from 2005 levels). We will review and revise these targets to reflect level of reductions to be made by different regions and sectors subject to further guidance being provided by the Government and the Committee on Climate Change.

The carbon footprint of homes in the Tees Valley

The emissions associated with wider consumption patterns are included in the carbon footprint, based on data provided by the REAP developed by the Stockholm Environment Institute. The small footprint shows what proportion of domestic emissions are currently measured in the Tees Valley emissions baseline. These account for only 52% of total domestic emissions. The big footprint also includes the 'hidden' emissions, for example the emissions associated with the construction and maintenance of buildings.

Mitigation

In the Tees Valley, housing accounts for around 30% of carbon emissions, slightly higher than the UK average of 27%[20]. The Climate Change Committee regards the following measures as effective in reducing emissions from residential buildings:

- Add and upgrade loft insulation (including 'topping up' existing insulation which is insufficient)
- Insulate cavity walls
- Insulate solid walls
- Accelerate replacement of existing boilers with condensing boilers
- Increase percentage of customers buying A+ rated wet appliances and A++ cold appliances
- Replace conventional light bulbs with energy efficient light bulbs

If every possible energy efficiency measure was installed in every single home that needs improved insulation and more efficient heating systems in the Tees Valley, this could save within the range of 300-500 kT CO_2e a year. The use of district heating systems and combined heat and power from local industry could increase these savings between the range of 400-700 kT CO_2e a year.

It is easier and cheaper to improve the energy efficiency of new buildings because the thermal efficiency standards (building regulations) now are much higher than in buildings that were built over 50 years ago. However, most of the buildings that have already been built will still exist in the future - the national housing stock that exists today will form over 80% of the housing stock in 2020. The Committee on Climate Change conclude that reducing emissions in existing buildings far outweighs the emissions reduction potential of new build.

Reducing the energy needed to heat and cool homes and buildings by increasing insulation is an essential factor in delivering more efficient and lower carbon ways to generate electricity and heat. Reducing the amount of energy consumed in homes will increase the potential for micro-generation technologies such as ground and air source heat pumps; micro combined heat and power (CHP), and distributed heating systems to deliver substantial benefits. This is because less energy will be wasted, and therefore less energy will be needed in our homes. Even small lifestyle and behavioural changes can a have a significant cumulative impact in reducing energy bills and emissions, for example turning the heating thermostat down, using economy washing programmes, and turning lights and appliances off when they are not being used.

Improving the energy efficiency of appliances through national and European legislation will contribute reduce the overall carbon impact of housing in the future, but behavioural change is essential to ensure that technological advances result in real emissions savings. Improvements in technology will have much less impact if people choose to own 5 plasma televisions per household (and then leave them on standby all day).

Opportunities

Reducing emissions from housing is strongly linked with the fuel poverty agenda. There are huge opportunities to reduce emission from homes through energy efficiency measures - particularly for vulnerable low income households.

In addition to work under the Covenant of Mayors, there is potential to develop new financial models to encourage uptake of renewables by owner occupiers. For example, Kirklees Council developed a 'pay as you save' initiative in 2009 called "RE-Charge" that offers interest free loans to home owners to install renewable energy and low carbon technologies on their property. The introduction of Feed-in-Tariffs in April 2010 for householders and communities who generate their own renewable electricity will also encourage the uptake of insulation and renewables in the Tees Valley. The Renewable Heat Incentive due to be introduced in April 2011 will also encourage households, communities and businesses to use sustainable heat sources.

Financial support is available for householders through a range of schemes: and the EST and TADEA provide independent advice, making this support less complicated and more accessible. Registered Social Landlords can also support householders through the Decent Homes scheme.

The private rented sector is often difficult to target, and contains some of the most energy inefficient housing in the Tees Valley. Therefore it is vital to promote uptake of Warm Front measures, and scheme such as the Landlords Energy Savings Allowance Scheme (LESA). LESA allows landlords who pay income tax to claim a deduction against profits for expenditure incurred before April 2015 up to £1500 per property to install loft or cavity wall insulation, as well as draught proofing and insulation for hot water systems in each property which they let[21].

Energy Performance Certificates, appliance labelling, and smart billing and metering all have a role to play in increasing awareness of energy and emissions savings. The EST/ Tees Valley Energy Savers and Government "Act on CO_2" communication campaign can all provide clear and consistent advice on how householders can make further energy bill/emissions savings. We will use a coordinated communication campaign to ensure these messages are relevant for households in the Tees Valley.

The Tees Valley Hotspots project improves health and living conditions for local residents by coordinating energy advice with existing services. It evolved through a partnership between National Energy Action, the Energy Saving Trust advice centre; Jobcentre Plus; Cleveland Fire Brigade and the NHS. Professionals such as fire safety officers and health visitors identify households that may be living in cold, damp conditions or living on a very low income and refer them on to the EST.

Tees Valley Growth Point Programme of Development has set aside specific resources to achieve higher standards including a focus on how it can aim for Building for Life Standards. This links to skills for low carbon and sustainable construction methods as well as in increasing jobs in manufacturing and installing insulation measures and micro-generation technologies.

Developing the skills and entrepreneurship base in sustainable construction methods now is likely to put Tees Valley in position to export skills in the future. It is clear that there will be an increasing demand for sustainable construction skills in the future, and particularly in areas that need to be regenerated. It is also likely that the economy will be in recovery by the time national legislation demands tighter standards. The Tees Valley has already recognised the market potential for sustainable housing, for example Bio-regional Quintain are constructing to zero carbon standards at Middlehaven without putting a price premium on their properties, and one of the objectives of the Growth Point Programme of Development is to encourage the CABE Building for Life gold standard in housing in the Tees Valley.

It is important to look at the bigger picture when developing plans to reduce domestic emissions. Ensuring maximum public and sustainable transport connections, and reducing consumption and waste are all important components of a low carbon future. They are also key elements of planning for vibrant communities - if there is safe and welcoming pedestrian space for children to play then this can reduce emissions from them staying indoors and playing on computer games all day.

Building Resilience

Retrofitting and refurbishing the existing housing stock is the most effective short and long term option for mitigating and adapting to climate change. It may be cost effective to include retrofitting in ongoing regeneration work to prevent disruption later - for example, improving homes beyond Decent Homes standards now may save further costly and disruptive action in ten years time. A significant proportion of homes in the Tees Valley need to be retrofitted to improve their energy efficiency, and some will need to be retrofitted to provide resilience to flooding, such as raised electrics. Additionally, the Decent Homes standard does not consider the need for cooling requirements due to hotter summers in the future. This will have significant impacts for vulnerable people, and may also cause increasing demand for electricity if people choose their own fossil fuel based cooling systems such as air conditioning or electric fans.

Significantly improving energy efficiency reduces residential energy demand - therefore locally appropriate micro-generation becomes a feasible option for some homes and communities. Decreasing reliance on grid electricity can reduce vulnerability to increasing grid disruption due to climate impacts (floods/storms). The opportunity to provide distributed heating through an Energy Services Company (ESCO) could reduce heating bills as well as provide lower carbon heating and cooling for homes and businesses.

Local Authorities are required to lead on the management of flood risk, particularly attenuation through sustainable urban drainage systems (SUDS) and surface water management plans. New developments are no longer able to automatically connect surface water drainage to the sewerage systems, so SUDS will become an increasingly important feature of the Tees Valley environment.

As well as being a more sustainable method for dealing with surface water and supporting local biodiversity, the cost of developing SUDS is less than developing conventional sewerage systems.

It will become increasingly important to engage with communities to raise awareness of the importance of SUDS[22], source control of flooding, the community benefits of water butts, and the wider impacts of paving over garden areas. Paving over front gardens also reduces biodiversity of urban garden landscape. There is opportunity to encourage people to have low maintenance water permeable surfaced gardens that increase opportunities for wildlife by providing advice and increasing awareness that planning permission is now required to pave front gardens[23].

Grey water re-use in new properties is also an example of a water saving technique that could be incorporated in new office and private dwellings, and the requirement of such techniques by the planning process would probably be the best way of ensuring their incorporation into new builds. Installing green roofs should be considered where appropriate as they can be used to retain, filter and use rainwater for flushing toilets, as well as reducing heating and cooling demands of buildings and supporting biodiversity.

It may be useful to incorporate more detailed assessments of the numbers of properties at risk under future climate scenarios based on detailed hydrological and hydraulic modelling. This will increasingly become a factor that influences the cost of home insurance premiums and may drive a cultural change in our approach to new housing developments - we urgently need to move away from lowest cost to most adaptable and sustainable developments.

Developing high quality green space will encourage opportunities for socialising; and scenic and accessible foot and cycle paths promotes a focus on wellbeing and healthy low carbon lifestyles.

Actions

We will:

- Improve home insulation and install energy efficient boilers as a priority because it reduces fuel poverty as well as reducing emissions.
- Ensure all social housing stock achieves maximum practicable energy efficiency by 2020. However, this accounts for around 20% of all homes in the Tees Valley, so we will also target private landlords and owner occupiers to promote home energy efficiency.
- Develop a communication campaign for the Tees Valley city region that will specifically target households according to tenure.
- Maximise opportunities for retrofitting during refurbishments of housing stock.
- Encourage and support the retrofit of homes that have been affected by flooding for example by raising ground level electrical sockets and improving surface drainage, to reduce the impacts and costs of future events.
- Through Tees Valley Unlimited, investigate options for introducing district heating in the Tees Valley. We will investigate how best to promote low carbon cooling technology to vulnerable residents.

Transport

Where we need to be

The Tees Valley has excellent public transport and electric vehicle infrastructure and is easily accessible by active and sustainable travel options such as walking and cycling.

Background

The Tees Valley city region is connected to regional, national and international markets through Teesport, the Durham Tees Valley Airport, rail connections such as the East Coast Mainline, a network of trunk roads, and a single carriageway connection to the A1 Motorway. The Tees Valley sees a daily inflow and outflow of traffic from surrounding areas, including County Durham, Tyne and Wear and North Yorkshire.

Tees Valley does not have one main centre - it consists of 5 towns with no dominant centre of commercial activity. This has led to an over reliance on the private car as the preferred mode of transport, and despite the fact that car ownership levels in Tees Valley are well below the national average, private vehicle use accounted for over 60% of sub-regional transport emissions in 2005.

The bus is the principal mode of public transport in the Tees Valley, with over 38 million journeys recorded in 2007/08, though the numbers of people using major bus services has declined around 15% since 2001. However, the number of people using rail has increased 57% from 1999/2000[24]. Longer term, improving connections between the Tees Valley and other city regions will enhance access to employment and education and make the North East more competitive as well as providing an option other than car travel. The North East has been designated as a Low Carbon Economic Area to develop ultra low carbon vehicles, and the Plugged in Places initiative will also feature heavily in reducing emissions from transport.

Teesport is the third largest port by volume in the UK and the seventh largest in Western Europe. It is a key component in the North East's transport and economic infrastructure and plays a vital role in supporting the petrochemicals, oil, gas and energy industry in the Tees Valley as well as the retail sector in the North of England. Durham Tees Valley Airport is considered a key economic driver for the city region. Passenger numbers through the Airport have declined 18% since 2005, but freight has more than doubled.

Vulnerabilities

In the Tees Valley, there are significant pockets of deprivation, including several communities who are geographically isolated from towns and services where a significant proportion of households do not have access to a car. Public transport access to services is essential to improve social inclusion and for maintaining the vitality of low-income neighbourhoods[25].

Obesity and corresponding health problems are a growing concern nationally and in the Tees Valley. The Lancet recently reported that the National Health Service in the UK spends over £3000 a minute on health problems that could be prevented by physical activity[26]. The National Institute of Clinical Excellence (NICE) developed evidence based recommendations on increasing physical activity in order to reduce the health impacts of a sedentary lifestyle[27]. Their recommendations state that planning applications for new developments should always prioritise the need for people (including those whose mobility is impaired) to be physically active as a routine part of their daily life. Local facilities and services must be easily accessible on foot, by bicycle and by other modes of transport involving physical activity. It should also be ensured that children can participate in physically active play.

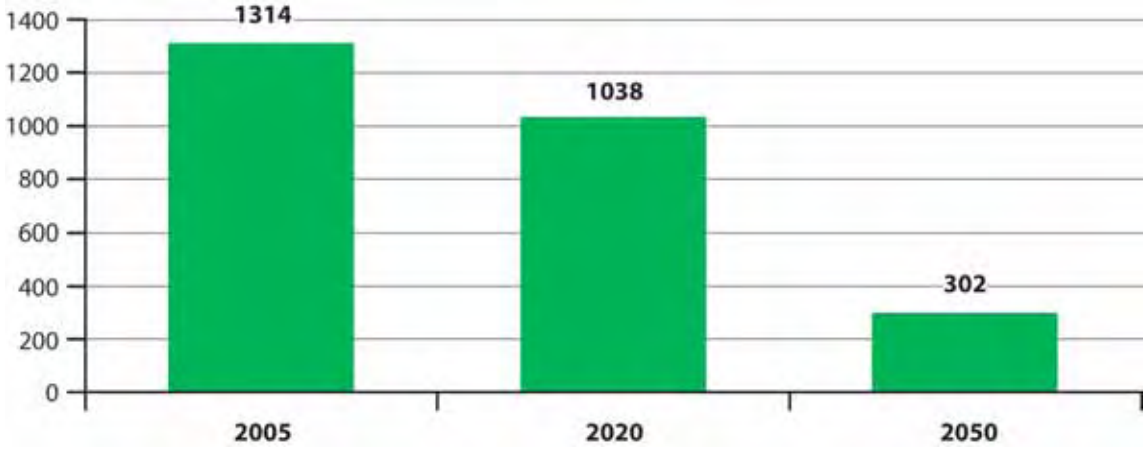
NICE also recommend that pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads, including people whose mobility is impaired. Giving priority to cyclists and pedestrians at road junctions and hazards will help to promote cycling and walking.

In terms of adapting transport infrastructure to cope with climate change, extreme high temperatures associated with climate change should only impact upon roads treated with coated chips and tarmac (surface dressing). Short life railway assets such tracks and electrification are replaced every 20-50 years so it should be possible to factor climate change impacts during routine maintenance and replacements. The railway assets that are susceptible to climate change impacts include embankments and cuttings, tunnels and arch bridges, metal bridges, and concrete bridges.

Emissions protocol and targets

Road transport emissions in 2005 were 1314 kT CO_2e. Transport emissions under NI 186 only include non-motorway road transport and also exclude emissions from rail, shipping, and aviation. The chart on the next page shows the 21% emissions reduction target for the road transport sector by 2020[28].

Road Transport Emissions (000 tonnes) of CO_2e



In line with the UK carbon budgets and the recommendations of the Committee on Climate Change, we have agreed to work towards the interim emissions reduction target of 34% from 1990 levels. This implies a 21% reduction from 2005 levels, which means that by 2020, road transport emissions in the Tees Valley should not exceed 1038 kT CO_2e.

Ultimately, road transport emissions may have to reduce to 302 kT CO_2e by 2050 to fulfil the UK target of a reduction of 80% from 1990 levels (which equates to 77% from 2005 levels).

Our targets support the commitment made by all the Tees Valley Local Authorities to go beyond the European commitment to reduce emissions by at least 20% through signing the Covenant of Mayors. We will review and revise these targets to reflect level of reductions to be made by different regions and sectors subject to further guidance being provided by the Government and the Committee on Climate Change.

The M7 indicator will be expanded to monitor the carbon intensity of rail and air transport.

The carbon footprint of transport in the Tees Valley

The emissions associated with wider consumption patterns are included in the carbon footprint, based on data provided by the Resource and Energy Analysis Programme developed by the Stockholm Environment Institute. The small footprint shows what proportion of transport emissions are currently measured in the Tees Valley emissions baseline. These account for only 43% of total transport emissions. The big footprint also includes the 'hidden' emissions, for example the emissions associated with the extraction of raw materials, car manufacturing, and railway, air, and shipping.

Mitigation

From a climate change perspective the growth and development of public transport is a positive mitigation measure, in terms of CO_2 per passenger kilometre. A shift from HGV to rail travel for the transport of freight also has the potential to save further CO_2 per kilometre travelled. The Committee on Climate Change did not quantify the emissions reductions associated with changing the mode of transport from private cars to more sustainable transport such as cycling or public transport. However, the Darlington Local Motion demonstration project calculated that 1% shift in mode of transport can substitute a million car journeys, demonstrating that even small changes can make a huge difference. Changing the mode of transport from private cars to public transport reduces congestion and social exclusion in the Tees Valley as well as supporting healthier lifestyles by increasing physically active travel. Improving transport connections throughout the Tees Valley by improving public transport and reducing congestion has clear carbon reduction benefits as well as supporting the local economy.

Smarter Choices is a set of techniques to influence people's travel behaviour towards more sustainable options such as walking, cycling and use of public transport[29]. The Department for Transport calculated public expenditure costs of achieving reduced car use by soft measures. On average, every £1 spent on well-designed soft measures could bring about £10 of benefit in reduced congestion.

'Soft' measures include things like behavioural change, as opposed to 'hard' engineering solutions such as new infrastructure.

Emissions from cars can be reduced by technology and behaviour. There are significant opportunities to reduce emissions from transport, including; workplace travel plans, car sharing, telephone meetings, school travel plans, personalised travel planning, public transport information and marketing, travel awareness campaigns and car clubs, as well as by using sustainable biofuels, public transport and by walking and cycling.

Improving the fuel efficiency of vehicles and reducing the need to travel will reduce emissions from transport in the Tees Valley. It is also important to point out that there are cumulative benefits from reducing congestion. Each car that is taken off the road reduces the tailpipe emissions from the remaining traffic because vehicles have much higher emissions in stop-start conditions than they do in free flowing traffic.

A shift to low carbon fuels will be necessary for people who continue to rely on their cars for essential travel. The Tees Valley has a significant role to play in supporting a shift to more sustainable fuels, as North East Biofuels is supported by NEPIC and Renew@CPI, and much of the North East region's biofuel infrastructure is located in the Tees Valley.

The North East is a Low Carbon Economic Area for ultra-low carbon vehicles, and Middlesbrough is one of the three areas in the north east who will be developing a standard infrastructure for charging electric vehicles under the 'Joined Cities' Plan funded by the Energy Technology Institute. Electric vehicle charging points will also be installed throughout the Tees Valley and North East through the "Plugged in Places" initiative. This increases options for sustainable travel in the area and will develop the infrastructure necessary for electric vehicles to contribute to emissions reductions throughout the North East.

Sustrans (2008) suggest that a modal shift target for personal transport could be set for all new developments[30], for example the Middlehaven development provides only limited parking spaces, is located within walking distance of Middlesbrough town centre, and will promote activities such as car sharing.

There is already a well developed footpath and cycle way network in the Tees Valley. These include the Teesdale Way running virtually the whole length of the River Tees, and Sustrans cycle routes providing links from East Cleveland and Redcar through to Middlesbrough, Stockton-on-Tees, Hartlepool and, via Wynyard, into County Durham[31].

Ensuring all new housing developments include space for cycle storage is a component of attaining higher levels of the Code for Sustainable Homes.

Other key issues include providing safe and secure areas for children to play out and access school by walking or cycling, so we will increase the provision of cycle storage facilities throughout the Tees Valley - at railway and bus stations, at schools, hospitals, doctors, dentists, local shops and tourist destinations. We also need to develop programmes for cycle training for adults as well as school children.

Reducing emissions from shipping is more complex. In the specific case of the Tees Valley, emissions reductions from shipping by decreasing the operation of the port may be counterproductive.

According to the North East Green House Gas Trajectories Study (2008), growth in container handling capacity at Teesport could result in a net saving of up to 38.5 MT CO_2 due to displacement of HGV road miles transporting goods from southern ports to the north. However, these emission savings will not be geographically attributed to the Tees Valley, and will probably increase local road transport emissions because of the way in which these are calculated for the national indicators.

Opportunities

North East Biofuels have stated their intention of sourcing biofuels increasingly from locally grown non-food crops. The North East Biofuels hub will also ensure that locally derived biodiesel and bioethanol form part of a sustainable local supply chain. This will play a key role in reducing emissions from road transport. There are also opportunities for industrial symbiosis - where energy crops can be used to remediate contaminated land in the Tees Valley.

Durham Tees Valley Airport is used by 900,000 passengers a year and deals with 1100 tonnes of cargo. The airport is home to 30 businesses employing 750 people. The UK will oversee around 80 airline carriers under the EU ETS. The Aviation Global Deal has recognised the need to find a global solution to emissions and supports investment in key emissions reduction drivers, including fleet replacement, infrastructure improvement and sustainable biofuels. Durham Tees Valley Airport is a vital connector to national and international markets, and we have the opportunity to support them to reduce their emissions from their operations, while opportunities to develop low carbon fuels are outlined in the North South Tees Industrial Development Framework.

The Tees Valley is an excellent logistics location, and there is a Centre of Vocational Excellence for logistics at Middlesbrough College.

There is a clear opportunity to optimise logistics across organisations in order to minimise the emissions (and cost) associated with increased use of the port and airport.

For example, improving coordination between firms using the same haulage company can substantially reduce road transport emissions by reducing 'empty' lorry journeys.

New job opportunities will be associated with adapting the transport networks to cope with climate change impacts, for example weather strategy posts and drainage engineers as well jobs associated with travel planning and fleet management.

Building Resilience

Clear health benefits are associated with a shift away from private car use - in terms of physical fitness, and reduced air pollution. There are also clear benefits in developing public transport schemes to reduce spatial inequalities in access to services and employment. Improving active and sustainable transport options in the Tees Valley will support the development of resilient and prosperous communities as well as reducing emissions[32].

It is important to ensure that the transport infrastructure in the Tees Valley is able to cope with a changing climate - particularly flood risk and heat waves. Areas of road surfacing identified as susceptible to high summer temperatures can be planed off and re-laid with bitumen macadam.

Engineering works can minimise extreme weather impacts on the railway line, for example rebuilding earthworks, providing scour protection to bridges, bolstering coastal defenses, and replacing track with a stiffer track construction. Increased or better vegetation management can minimise the impacts of longer growing seasons such as increased incidents due to vegetation on the lines.

The frequency of bridge inspections should be increased on bridges that are known to experience weather related problems e.g. Yarm especially scour problems following periods of heavy rainfall.

It would be useful to investigate whether the Transporter Bridge will be vulnerable to increasing sea levels. It would also be useful to explore where new roads and railway sections at raised levels (on stilts/viaducts) should be developed in flood prone areas, and to consider adaptations and new bypasses for major routes that are already affected.

Longer growing seasons will need to be factored into operational plans and budgets. This is especially relevant for footpaths and cycle routes where overgrown vegetation (especially nettles) may discourage people from as walking or cycling.

The impacts of climate change on Teesport sea defenses will need to be assessed. If they are adequate to see out their design life, consideration of climate change should then be given to design and maintenance programs. The Regional Flood Defence Committee has various flood risk management projects funded through their Local Levy programme, including the Tees Tidal Resilience, and a review of the flood risks to industry. Cranes should be assessed for impacts from any increases in wind speed. When the hard standing areas of the port are upgraded or extended, consideration should be given to increasing rainfall and drainage requirements.

Actions

We will:

- Prioritise improving public and sustainable transport in local transport planning, and increase the provision of facilities for cyclists throughout the Tees Valley.
- Develop travel plans to influence people's travel behaviour towards more active and sustainable options such as walking, cycling and the use of public transport
- Prioritise active and sustainable travel. Public sector organisations will improve the environmental impact of their fleet vehicles.
- Include climate change impacts in Transport Asset Management Plans and ensure that footpaths and cycle routes are maintained in good condition so that people are encouraged to use them.

Our Local Environment

Where we need to be

We fully value and benefit from the ecosystem services provided by our natural environment, and everyone has access to high quality green spaces.

Background

The Tees Valley is an area of contrasting landscapes where affluence co-exists with pockets of deprivation. Housing estates in need of regeneration, the industrial skyline and areas of vacant and derelict brownfield land sit alongside a national park, heritage coastland and mainly arable farmland. The natural environment plays a crucial role in enhancing community health, and wellbeing, and supporting economic development, as well as providing ecosystem services that absorb carbon emissions, support biodiversity, and minimise the impacts of flooding and heat waves.

The way in which the built environment is planned and designed also influences climate change and biodiversity. An attractive urban environment raises the value of commercial facilities such as offices, and better building design can greatly reduce the energy consumption of buildings, as well as increase their resilience to flooding and heat waves.

Emissions protocol and targets

The directly measurable emissions associated with the local environment in the Tees Valley are not included in NI 186 reporting. The emissions that we have figures for include land use, land use changes and forestry (LULUCF), and the emissions from waste that are recorded for all local authorities through Waste Data Flow. Together, these accounted for 71 $kTCO_2e$ in 2005. Following our commitment to work towards achieving the emissions reduction targets recommended by the Committee on Climate Change, we could set a target to reduce our emissions to no more than 56 $kTCO_2e$ by 2020 and no more than 14 $kTCO_2e$ by 2020.

However, increasing recycling reduces the emissions associated with the extraction, transport, and manufacture of raw materials and improving land management and increasing the number of trees, can actually absorb carbon dioxide from the atmosphere. The total carbon stored in UK soils and forests is equivalent to over 37 billion tonnes of carbon dioxide - more than 50 times the UK's annual emissions[33]. Therefore, there is actually the potential to go beyond an emissions reduction target associated with our local environment. By maximising recycling, improving land management practices and increasing areas of natural vegetation we can work towards developing systems and practices that absorb carbon dioxide from the atmosphere.

The carbon footprint associated with quality of place in the Tees Valley

The emissions associated with wider consumption patterns are included in the carbon footprint, based on data provided by the Resource and Energy Analysis Programme developed by the Stockholm Environment Institute. The small footprint shows that the proportion of emissions associated with the quality of place that are currently measured in the Tees Valley emissions baseline account for less than 5% of emissions, directly relating to waste. The big footprint also includes the 'hidden' emissions, for example the emissions associated with food production and transportation and the production and transportation of other consumables such as clothing and furniture.

This section outlines how climate change influences a number of factors that are important for our local environment. These include building design, Green Infrastructure, biodiversity, land management, tourism, food consumption and waste.

Building design

An attractive urban environment helps raise the value of commercial facilities such as offices by providing an attractive setting, making them easier to let and achieve higher rentals. Open space next to residential areas helps make the houses more attractive and the community more resilient as they provide areas for healthy recreation and minimise flood risk. Building design also has a vital role to play in reducing the energy consumption of buildings and in increasing resilience to flooding and heat waves.

There are significant opportunities for local authorities to reduce emissions from buildings through the planning system by mandating that all new developments achieve the maximum sustainability rating possible, for example BREEAM Excellent[34].

Existing buildings may need to be retrofitted or adapted to make internal working conditions satisfactory during heat waves, and where flood damage occurs, retrofitting resilience measures such as raised electrics should be a priority.

Retrofitting cooling measures will include natural and mechanical ventilation, or natural shading through tree and vegetation planting outside of buildings, including green roofs. Trees take a long time to grow big enough to provide shade which means that the Local Authorities will need to determine the most appropriate species to plant now, and consider the biodiversity impacts of the species they plant.

Native tree species are considered to be of higher value for nature conservation because they are more likely to encourage and support our biodiversity.

Green Infrastructure

The Tees Valley Green Infrastructure Strategy was produced to direct the improvement of the Tees Valley environment in a way that encourages sustainable economic growth. The Green Infrastructure Strategy has a key role in improving access to the countryside through a network of greenways, cycle ways and bridleways. It is also crucial to maintain open space to minimise flood risk and climate change impacts on biodiversity.

Agricultural land in the Tees Valley makes up around 60% of the total land area[35]. Agriculture has an important role in maintaining the rural economy of the Tees Valley where 75% of agricultural land is classed as Grade 2 or 3 under Agricultural Land Classification. Farming land management practices have a huge role to play in supporting biodiversity, in attenuating floods, in reducing emissions from fertiliser applications and other land management practices, and in developing sustainable local value chains that can reduce the emissions associated with importing food and energy crops.

There are about 4000 ha of woodland in Tees Valley, of which 1440 ha is ancient semi-natural woodland, and around 500 ha is mature coniferous and mixed deciduous plantation. Woodland and forestry have a role in recreation, tourism, maintaining biodiversity, sequestering carbon, and also in some cases providing biomass for low carbon energy production.

Development of new gardens and green spaces now and in the future needs careful consideration of the impacts of climate change on plants species, particularly when planting long-lived species.

The Tees Valley Green Infrastructure Strategy promotes the following climate change relevant outcomes:

- Increasing trees and woodland, particularly in urban areas, to provide shade and cooling among developments and open spaces - providing green refuges to lessen the effect of the urban heat island,
- Developing new water-bodies and areas to cope with increased storm-water run-off.

- Encouraging the principles of sustainable urban drainage systems (SUDS) to reduce flood risk.
- Extending the walking and cycling network along green corridors, helping to reduce reliance on private transport.
- Promoting action at the landscape scale to link, buffer and extend existing semi-natural habitats to help wildlife adapt to the impact of climate change.
- Promoting changes in land use and management that will decrease run off.

The implementation of the Tees Valley Green Infrastructure Strategy will increase resilience to the direct impacts of climate change. It is also important to maintain and increase ecological resilience to climate change by ensuring the protection and appropriate wildlife habitat management of protected wildlife sites in the Tees Valley.

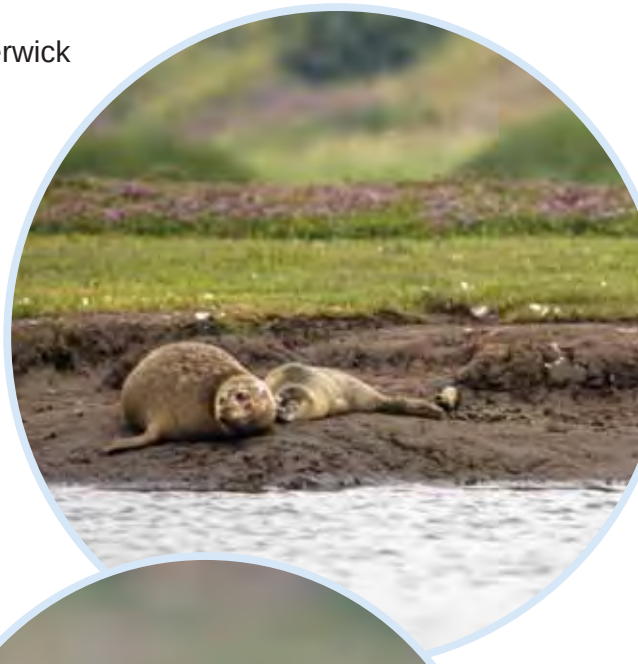
Biodiversity

The Tees Valley Biodiversity Action Plan is a plan of action for the threatened and characteristic habitats and species in the Tees Valley. This plan takes the objectives and targets of the UK Biodiversity Action Plan that are relevant for the Tees Valley context[36].

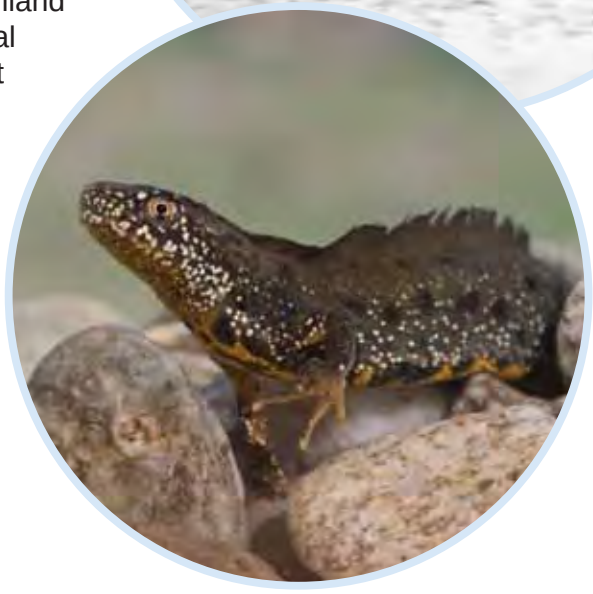
Semi natural habitat in Tees Valley mostly exists in small fragmented patches, so most areas of importance for wildlife in the Tees Valley exist as tiny 'islands' in either intensively managed farmland or areas of housing which makes them vulnerable to disturbance. For example, climate change may cause migration of species northwards in the UK, but because suitable habitats exist in isolated patches there are barriers to species movement in the Tees Valley. The implementation of the Green Infrastructure Strategy will support some level of species migration, and promoting "The Big Wildlife Garden" - a scheme that aims to develop a network of wildlife friendly gardens throughout the UK - will also support local biodiversity[37].

Increasing summer temperatures and reduced rainfall from summer to winter is likely to increase the number and ecological significance of accidental and deliberate fires especially on heath land, urban grasslands and reed beds. This is already an issue on two local wildlife sites at Eston Hills on the

lowland heath habitat in Redcar and Cleveland and Berwick Hills reed bed and grasslands in Middlesbrough.



In the Tees Valley, coastal mudflats and saltmarshes, maritime cliffs and slopes are national and local priority Biodiversity Action Plan habitats that will be affected by climate change due to increased erosion, changes in erosion and sediment accumulation patterns, and 'coastal squeeze' of habitats between the sea and intensive agricultural or industrial developments. Coastal squeeze means a reduction in the area of inter-tidal habitat. It can be exacerbated as a consequence of sea level rise and the action of flood defenses. Without defenses, the inter-tidal area gradually moves inland over time and there are fewer impacts on natural habitat. With defenses, the movement of habitat inland is obstructed. Where coastal squeeze is identified as an issue, compensatory habitat will be developed, for example in Greatham North.



The Department for Environments Food and Rural Affairs (DEFRA) have developed guidance on conserving biodiversity to adapt to climate change[38]. The principles in this guidance include:

- Conserve existing biodiversity.
- Reduce sources of harm not linked to climate or climate change.
- Develop ecologically resilient and varied landscapes.
- Establish ecological networks through habitat protection, restoration and creation.
- Make sound decisions based on analysis.
- Integrate adaptation and mitigation measures into conservation management, planning and practice.

Biodiversity gains can be factored into climate change adaptation measures such as river restoration and flood storage schemes, coastal realignment and tree planting initiatives. Maximising areas to increase flood attenuation, and create opportunities for biodiversity to adapt to climate change by improving wildlife corridors and habitats is a major component of creating a high quality local environment in the Tees Valley. Natural England have developed a Natural Character Assessment methodology to assess the vulnerability of local ecosystems to climate change.

Planning

Flooding in estuaries may result from the combined effects of high river flows and high sea surges. According to Planning Policy Statement 25 on Flood Risk, when taking account of climate change impacts in flood risk assessments covering tidal estuaries, it will be necessary to combine the allowances for sea level rise and the allowances for peak flow, wave height and wind speed. This has been addressed in the Tees Tidal flood risk strategy using national risk guidance from DEFRA.

Land use planning needs proactively to consider likely future recession rates of the coast under rising sea levels before releasing areas of land for development. In some areas, it will be necessary to consider relocating assets such as the minerals (potash) railway line, parts of the Cleveland Way long distance footpath and the Cowbar Lane road.

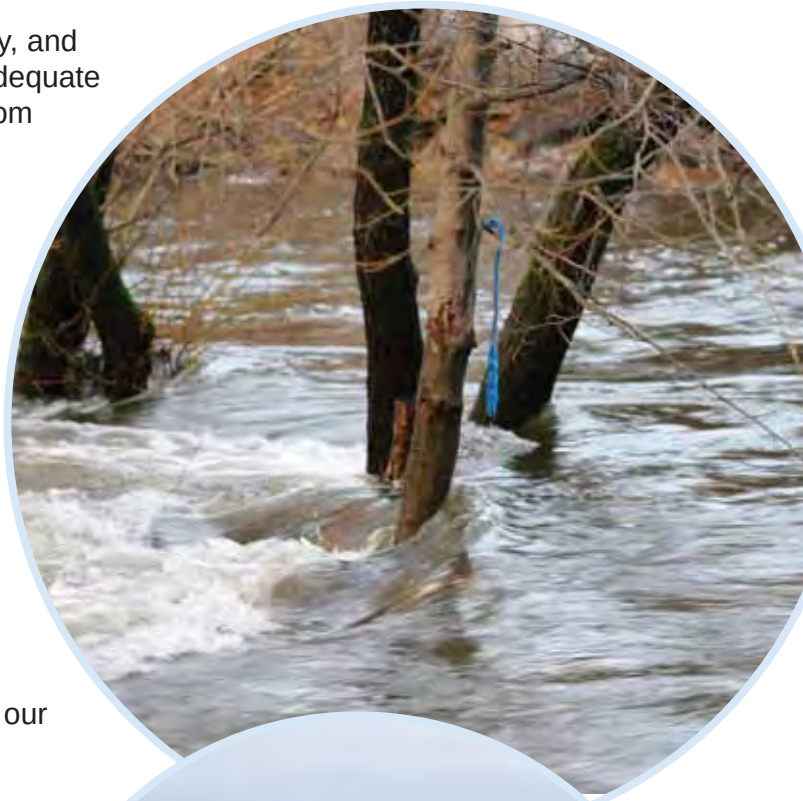
Habitat loss of coastal habitats as a result of sea level rise or action taken to protect against flooding needs to be offset by an appropriate area of habitat creation to ensure that there is no net loss of habitat.

Ongoing coastal monitoring by the North East Coastal Authorities Group remains important in the Tees Valley in order to better quantify the effects of climate change on natural coastal processes, especially in areas where landward relocation of assets or redevelopment of prime coastal sites is being considered. There is a need to allow natural process of cliff erosion as the plant, insect and bird communities of maritime cliffs are of nature conservation significance as is their heritage. There are 19km of maritime cliffs and slopes in Tees Valley stretching from Saltburn to Staithes that forms part of the North Yorkshire and Cleveland Heritage Coast.

There is a multi-agency forum, strategy and steering group for this and a project officer who is based at the North York Moors National Park Authority. The need to manage for increased erosion due climate change is covered in the Heritage Coast strategy and two local Biodiversity Action Plans covering maritime cliffs and slopes North York Moors and Tees Valley. This involves establishing a 'one-field-back principle' along the coastline: buffer zones the width of a field along the cliff tops, to enable a natural wildlife zone to assert itself and replenish habitats lost to erosion. This is being progressed on the ground by the project officer and the National Trust who are land owners of some coastal sections.

In the Tees Tidal area, there are several options available to deal with increased flood risk, including maintaining existing flood defenses, and potentially developing new flood defenses, for example in Redcar and Cleveland.

The Local Authorities, Environment Agency, and private landowners may need to ensure adequate maintenance plans for debris clearance from watercourses, such as streams, rivers, becks, and surface water drainage to prevent localised back-up flooding. This may need to include monitoring the location and spread of invasive non-native species and carrying out coordinated programmes where necessary.



We need to develop a greater understanding of how land use should be prioritised by our planning systems to account for ecosystem services such as flood attenuation.

Also, because our local environment is connected through different boundaries to our local authority areas (for example river catchments), we need to develop a local impacts profile and adaptation planning for the city region. This will help our local authorities to take trans-boundary issues into account when developing their local adaptation plans, for example to account for flood risk and service disruption, but also to reduce habitat fragmentation by supporting landscape scale ecological networks. This is important because local authorities have new duties on managing flood risk, including managing surface water flooding and drainage at local level and stronger planning and building controls. The methodology for vulnerability mapping currently being developed by Durham County Council, as well as the Natural Character Assessment developed by Natural England will help us to understand and plan for city-regional adaptation issues.

In order to account for future climate change impacts on tourism in the Tees Valley, there may be a need to assess the future planning requirements needed for caravan and camping parks. Low volume sites are not currently subject to planning permission owing to their temporary nature. Sites placed near watercourses may be highly vulnerable to flooding impacts.

Tourism

As well as direct climate change impacts such as hotter summers and wetter winters, the open space network impacts on tourism. The Tees Valley has a number of major tourism assets, including the coastline, the River Tees, the moors, cultural attractions such as MIMA, conservation attractions such as Saltholme, railway heritage as well as regularly hosting local and international festivals. Tourism is a growing sector of the Tees Valley economy and is considered a key component of improving the local economy. Tourism provides a way of encouraging business formation, is a relatively easy sector for new businesses to enter and also for the long-term unemployed to find jobs.

There are also volunteering opportunities centred on place based tourism, for example with the National Trust.

Improving local recreation and tourism opportunities and increasing the number of people who choose local holidays can reduce transport emissions as well as support the local economy. It is important to ensure that all key tourist centres and attractions are linked by affordable public transport, cycling or footpath access, so that an improved environment for tourism does not increase the emissions from transport.

Increasing the number of people served by improvements to the public transport network and cycle routes can provide low cost (and therefore more widely accessible) tourism opportunities.

There are climate change and wider benefits to strengthening local tourism, for example, activity based tourism has strong links to the healthy living agenda and in reducing obesity in children.

Adaptation of heritage buildings to climate change will require changes to management structures, such as:

- Undertaking minor repairs more regularly, instead of infrequent major repairs.
- Deciding whether to re-locate items of heritage away from a threatened site.
- Long term planning for managed realignment of sites at risk.
- More rigorous and frequent inspection, maintenance and monitoring of the physical fabric of structures.
- Making action plans for emergency response.
- Deciding whether to accept certain losses to cultural heritage and managing the retreat by recording the impending loss. It is not a realistic proposition to conserve everything forever. Faced with finite resources, great environmental risks and a large number of cultural assets, a methodical assessment of what is conserved and why, may be necessary.

Physical adaptation may be required to supplement management changes. Physical adaptation is likely to introduce a visible change for example, increasing the size and number of gutters, hoppers and down pipes to cope with the projected increased in rainfall, will become necessary.

Land management

Best practice in agricultural land management can substantially reduce emissions, for example emissions of nitrous oxide associated with fertiliser applications, reducing methane emissions from livestock, and sequestering carbon in soils and biomass. In the UK, agri-environmental schemes currently save over 3 million tonnes CO_2 per year, largely by supporting lower intensity farming practices[39]. In addition, these schemes support biodiversity and increase public access to land for recreation, and can potentially contribute to landscape scale adaptation such as flood attenuation and strengthening wildlife corridors.

CLEMANCE have researched biological methods of land remediation (using plants to remove pollutants from the soil) that will also provide a source of local biomass for energy or biofuels. CLEMANCE are also researching how to develop biochar products in the Tees Valley[40].

Renew@CPI have commissioned a study to assess the potential of rural areas to develop anaerobic digestion facilities. Anaerobic digestion provides high quality fertilizer as well as generating sustainable energy, which could encourage sustainable local food production.

Food Consumption

According to the 2007 Tees Valley Footprint Report, the Tees Valley has one of the highest food carbon footprints of any area in the UK. This indicates that a relatively high proportion of processed food is consumed in the Tees Valley. Consuming a high proportion of highly processed food creates a huge carbon footprint and significantly contributes to poor health in the Tees Valley.

We need to raise awareness of how food production and consumption interacts with our local and global environment. More efficient resources management in organisations and by individuals is being strongly promoted, for example increasing rates of recycling and improving water resource management. This is being achieved through awareness raising campaigns and by engaging with communities in the Tees Valley, for example through the climate change lead schools programme and innovative public events and festivals.

The fact that nutritionally poor food is 'cheap' is false economy, because of the costs of dealing with the health consequences. Additionally, studies commissioned by WRAP have also shown that at national level we waste 15 pence of every pound we spend on food items[41]. There are clear health, financial, and climate change benefits in planning healthy meals. In many cases, supporting local food production in season, and Fairtrade products[42] helps to reduce the climate change impact of food production and consumption. Our food consumption patterns have direct short term impacts on water resources and food security in developing countries, as well as the longer term climate change impacts due to tropical deforestation, land degradation, and the transport of products.

Relatively small changes in lifestyle choices could have a large impact on the carbon footprint of an average resident in the Tees Valley. Nutritionally balanced diets have lower carbon footprints, particularly when food is locally and seasonally sourced - so there is a strong link to the healthy living agenda[43].

Middlesbrough Environment City runs an urban farming project, and has an annual town meal that uses locally grown produce from local allotments. A number of community allotments schemes in the Tees Valley promote local food production and are an important part of supporting healthy and sustainable lifestyles in the Tees Valley.

The Tees Valley Local Authorities already jointly procure locally produced food where possible. Supporting locally produced food is important, because as well as significantly reducing the emissions associated with food miles, it is also can improve our health and support our rural economy.

Waste

Waste and resources management is a key area for emissions reductions. Currently, most municipal waste from Hartlepool, Middlesbrough, Redcar and Cleveland and Stockton goes to the SITA energy from waste plant. A small proportion of waste goes to landfill in these four boroughs when this plant is non-operational. Darlington is not currently part of this contractual arrangement as it inherited a landfill based contract when it became a unitary authority in 1996. Darlington has secured a new intermediate level contract based on a mechanical composting plant to be commissioned in 2009-2020.

Greenhouse gas savings are partly made from reductions in landfill emissions of methane, which has a much stronger global warming effect than CO_2 (21 times greater), and partly from increasing recycling. The carbon emissions savings associated with recycling are:

CO_2 emissions savings associated with recycling[44]

Textiles	7.869
Plastic (dense)	2.324
Plastic (film)	1.586
Glass	0.762
Paper and card	0.496
Ferrous metals	0.434
Compost	0.0162

All landfill sites in the Tees Valley have landfill gas control, where gas is flared to generate CO_2 rather than CH_4 (methane).

Owing to the relatively small size of Tees Valley landfills, and the wastes that have been disposed of (e.g. incineration residues), it is not economically viable to utilise this gas for fuel.

At the household level, home composting provides the opportunity for households who have access to a garden to develop their own environmentally friendly fertiliser from waste organic products. The carbon benefits of composting in the Tees Valley are threefold:

- Organic waste is heavy and bulky to transport, so reducing the quantity of organic waste transported by refuse vehicles reduces road transport emissions.
- Organic waste tends to be 'wet' and therefore reduces the efficiency of the Energy from Waste plant at Haverton Hill. Therefore, reducing the quantity of organic waste reduces the energy needed to operate the Energy from Waste plant. Additionally, if organic waste generated in the Tees Valley goes to landfill, then it produces methane which is an extremely potent greenhouse gas.
- Substituting home compost for peat based compost will help to maintain the integrity of peat bogs (which absorb carbon).

There are specific policies on household waste awareness and minimisation in the Joint Tees Valley Waste Strategy. Current targets for the Local Authorities set by the Joint Waste Strategy will need to recognise the new targets under the EU Waste Framework Directive, which requires 50% recycling of all paper, glass, metal, and plastics by 2020.

We support these targets and the Local Authorities will work towards meeting and exceeding these standards where possible. We also believe it is important to promote the concept of a 'waste hierarchy' (reduce, re-use, recycle) in order to encourage a reduction in waste - the most effective way of cutting emissions from this sector. Re-using and recycling waste will also likely to play a significant part in reducing the emissions associated with the extraction and manufacture of raw materials.

Actions

We will:

- Go beyond minimum requirements to integrate renewables in new developments where feasible, and will consider how building design can be optimised to reduce emissions as well as adapt to climate change.
- Promote the implementation of the Tees Valley Green Infrastructure Strategy to help us deal with the impacts of climate change, for example by increasing trees in urban areas, to provide shade and absorb carbon emissions.
- Consider future climate change when deciding the most appropriate species to plant now, taking into account the biodiversity impact of the species chosen.
- Optimise areas to increase flood attenuation, and create opportunities for biodiversity to adapt to climate change by improving wildlife corridors and habitats.
- Ensure there are adequate maintenance plans for debris clearance from streams, rivers, becks, and surface water drainage to prevent localised back-up flooding.
- Use public sector procurement processes to increase the demand for locally produced, organic and fair-trade products.
- Investigate the feasibility of promoting local food production at a sub regional level, for example through organic box schemes and farmers markets.

Communication and Behaviour Change

Where we need to be

All sections of our communities are increasingly aware of the need for sustainable development and able to play a role in tackling climate change. We value quality of life and sustainable consumption.

Background

There are a wide range of technical solutions that will help us to rapidly reduce our carbon emissions, but ultimately, it is our daily behaviour that will determine the extent to which we can achieve our vision of creating prosperous and resilient communities in a low-carbon economy.

The message is quite simple, climate change is already happening, it will affect people in the Tees Valley and we need to take action to reduce our emissions and to adapt our lifestyles and properties now. The actions we need to take to tackle climate change will improve our quality of life as well as our local environment, and there is already a huge amount of work going on.

In 2008, the North East region piloted the Climate Change Lead Schools initiative, which was developed in collaboration between the Science Learning Centre North East and local school teachers. The Climate Change Lead Schools project provides teaching materials and positive messages for learners from Key Stages 2 and 3 about what we can do about climate change by focusing on six themes:

- Science
- Climate change and the media
- Indicators - such as biodiversity indicators
- Impacts
- Mitigation
- Adaptation

The pilot year attracted 80 participating schools, 24 of which were from the Tees Valley. Any school with a passion to learn about and do something about climate change can apply to become a climate change lead school, and the only cost associated with the project is a one day continuous professional development (CPD) course for one teacher. The teaching materials for Key Stage 2 and 3 were developed by teachers, and the teachers were involved in delivering the CPD course. The project aims to develop 'clusters' of participating schools, so that children who have learned about climate change at Key Stage 2 level will continue through Key Stage 3.

Engaging with adults about climate change is more challenging. "The New Rules: New Game[50]" developed by Futerra contains a number of principles that are helpful in communicating climate change in the community:

- Go beyond the 'usual suspects' or people who already consider themselves to be environmental or ethical consumers.
- Be aware of the difference between conscious and unconscious behaviours - for example the difference between buying a car and driving a car - when people are on 'autopilot' they may not take on board messages relating to 'active choice'.
- We need to find a way of cementing conscious behaviour change so that new behaviours become new habits.
- Remember that people are complex and changing peoples attitudes may not automatically change their behaviour.
- Ensure that the desired behavioural change is 'socially acceptable' - we need to make low carbon lifestyles 'normal' and personalise the message.

The Tees Valley Local Authorities have agreed over 20 actions relating to education and awareness raising about climate change in their existing plans. These range from publicising existing grant schemes, to training tenants and housing staff on sustainable energy use in the home, to developing a film about climate change with the youth assembly, to working with local schools and the Climate Change Lead Schools project. We will develop a communications campaign for the Tees Valley, which will ensure that our messages on climate change are relevant, coherent, and targeted appropriately to households and communities.

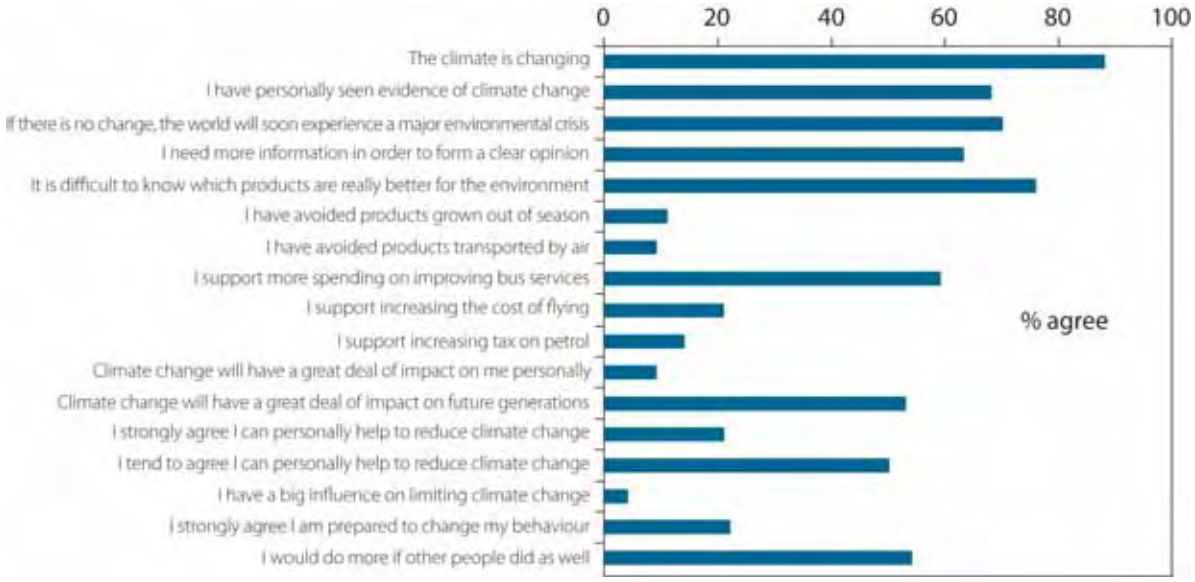
Vulnerabilities:

The Ipsos MORI 2007 UK survey "Turning Point or Tipping Point" indicates that despite a high level of knowledge about the concept of climate change, many people are struggling to accept the fact that there is global scientific and political consensus on the issue of human caused climate change, and most people are not taking action to reduce their personal carbon emissions.

The Tees Valley Local Authorities will conduct periodical surveys to determine the extent of knowledge and action on climate change in the community and we will develop qualitative indicators that can be used to assess progress on communication and awareness raising.

The graph on the next page shows some of the key findings of the Ipsos MORI survey.

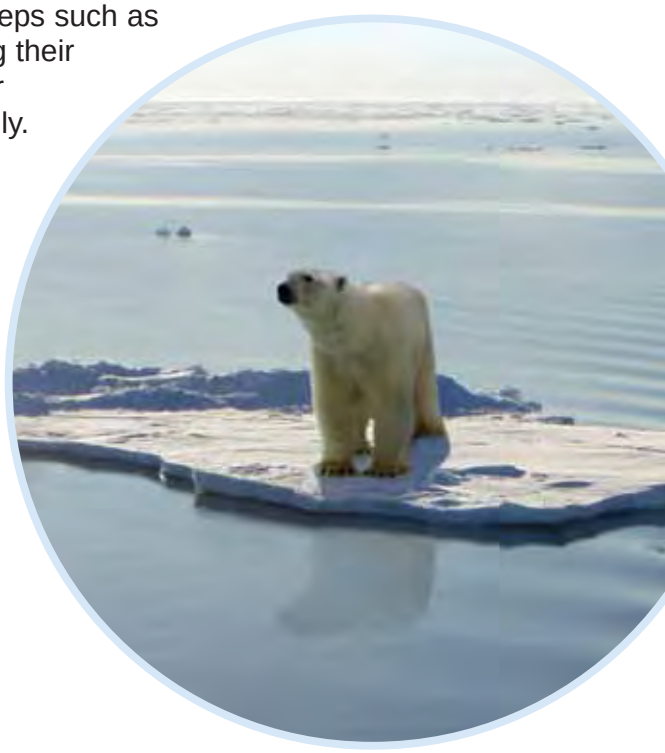
Findings of the "Turning Point or Tipping Point" survey in 2007



(Ipsos MORI, 2007)

Some of the reasons why so many people distance themselves from accepting the science and taking action on climate change include:

- Climate change is perceived to be a 'big' global problem, beyond the control of an individual.
- The threat of climate change is seen as being 'in the future' or affecting people in other countries.
- Many people assume that by taking small steps such as re-using a plastic carrier bag, they are 'doing their bit' and therefore don't need to change other habits - for example, using cars unnecessarily.
- People value the comfort and convenience of modern day living, and are not prepared to sacrifice the things they have worked hard to obtain - especially not to prevent some future global catastrophe and especially when hardly anyone else is taking action.
- Climate change is largely perceived as an 'environmental' issue that is threatening polar bears, not communities here in the Tees Valley.
- Climate change is a complex issue and people are bombarded with conflicting messages relating to green products and lifestyles.



Mitigation

Tackling climate change requires both technological and social solutions. Decarbonising energy production, improving energy efficiency in homes and industry, and improving options for sustainable travel are all vital to address climate change. But none of the technical options for addressing climate change will be really effective without a corresponding shift in the way people live their lives.

Lots of awareness raising campaigns are directly associated with reducing our carbon footprint, but it is generally not possible to directly quantify the exact amount of carbon savings achieved by increasing awareness of our impact on climate change. However, we will monitor emissions reductions across the Tees Valley and communicate this to residents and businesses through our website.

Opportunities

Residents of the Tees Valley have, on average, slightly smaller carbon footprints compared to other parts of the country, so there is a clear opportunity to work with communities to develop locally appropriate and healthy ways to reduce this further. It is important to work with communities to strengthen aspirations towards healthy and sustainable lifestyles and quality of life, rather than increasing consumption and disposal of carbon intensive products. It is equally important to work with communities to develop appropriate and effective means of adapting to climate change.

Non-environmental local events and attractions provide opportunities to raise awareness of climate change, for example the Tall Ships event in Hartlepool was a Sustainable event, working towards gaining BS 8901 on Sustainable events. We will ensure our local events and attractions are low-carbon and sustainable wherever feasible.

In order to effect significant behavioural change, it is necessary to have a differentiated approach that takes into account the perceptions and needs of different groups of people living in the Tees Valley.

There are opportunities to build upon existing networks of people who have regular contact with different communities in the Tees Valley. Working with schools is important for a number of reasons. It is the youth of today who will be forced to deal with the impacts of climate change in the future, and they have the right to be involved in action to tackle climate change now. Also, schools are important and influential community leaders and many schools are located in areas that are especially vulnerable to climate change impacts such as flooding.

Every Local Authority has responsibility for social services, and every Local Authority has a voluntary development agency in regular contact with voluntary sector organisations. Front line staff and volunteers are key to engaging with communities, particularly hard-to-reach and vulnerable groups such as asylum seekers and refugees; gypsies and travellers; lesbian, gay, bisexual and transgender people; remote rural communities; people with disabilities and older people. Front line staff and volunteers are also able to assist in identifying community "gatekeepers" - people who have a high level of trust and/or status and whose support will ensure higher levels of community participation.

It is important that we are able to tailor our communications appropriately to a wide range of people if we want to achieve significant changes in behaviour. For example, we may alienate affluent communities if we focus on financial savings, and it is not helpful to provide energy savings advice in the wrong language.

The Tees Valley Local Authorities have a very clear role in providing leadership on climate change. When we are working with people in the community and asking them to make significant changes the way they live their lives, it is reasonable that they will first want to be able to see what action is being taken by the Government, Local Authorities and other public sector bodies.

Providing definite leadership is important because actions such as ensuring that all your staff are supported to use sustainable transport to travel to work sends a clear signal that action on climate change is the norm. In terms of leadership in the community, it would be unfair to expect householders to invest in insulating their homes if most public sector buildings have "G" ratings on their Display Energy Certificates.

It is important to remember that most of our personal carbon emissions are a 'hidden' consequence of modern day living. Most people have not purposefully gone out to pollute the atmosphere, so it is important to show people how they can make a real difference without alienating them by making them feel guilty or stupid. Positive messages are more likely to engage people than negative ones.

An effective way to reduce these 'hidden' emissions is by working with communities to make our lives healthier as well as more sustainable. Local Authorities have the opportunity to make it easier for people to change to low carbon lifestyles by developing suitable incentives such as convenient and affordable public transport, high quality areas for sustainable recreation, excellent recycling collection services, affordable home insulation, and opportunities to get involved in local food production.

Building Resilience

Engaging and empowering communities is an important step in tackling climate change, and vital to successful adaptation. People will increasingly be exposed to rising energy bills and insurance premiums in the future, so we need to communicate actions that can be taken now to minimise current and future risks.

It is also important that householders are able to assess the range of risks to their own properties so that they can make informed decisions relating to purchasing and locating in particular areas. Similarly, communities need to be aware of the fact that climate change will increase the damage associated with extreme events - for example disruption to mains services such as water and electricity, and the possibility of being cut off from roads in the event of a flood. The impacts of climate change are not only distant melting ice caps and sea level rise on the other side of the world, but include increased flooding, and associated indirect impacts like service disruption and failure.

A certain level of climate change is inevitable because of the emissions that have already been released into the atmosphere. The impact of climate change on low-lying countries will increase the number of people who will be forced to relocate in the future. Globalisation, migration and the presence of existing diaspora[45] communities may mean that public services need to assess their capacity to cope in the event of significant migration of people in the future, for example from low lying countries such as The Netherlands, Bangladesh or Egypt.

Actions

We will:

- Conduct periodical surveys to determine the extent of knowledge and action on climate change in the Tees Valley and use this to assess progress on communication and awareness raising.
- Ensure that householders and businesses living in flood warning areas are aware of potential disruption caused by flooding, and will improve community preparedness for severe weather events.
- Increase the number of schools participating in and the Climate Change Lead Schools project.
- Build on existing networks of professionals and volunteers to engage with local communities on climate change, especially hard-to-reach and vulnerable groups.
- Ensure local events and attractions are low-carbon and sustainable as far as possible. For example the Tall Ships event in Hartlepool was a Sustainable Event.

Implementation

The Tees Valley Climate Change Strategy and the Tees Valley Statement of Ambition support the commitments made by Local Authorities through the Covenant of Mayors initiative to reduce emissions in their local area by at least 20% by 2020. They will also help the Tees Valley to rise to the challenging legal obligations introduced by the UK Climate Change Act 2008.

The Implementation Plan for the Tees Valley Climate Change Strategy is based on best practice in the short term actions already contained within the Tees Valley Local Authority Climate Change Action Plans and the Local Area Agreements developed through Local Strategic Partnerships. The local actions that are contained in the Implementation Plan are either already planned or being implemented by Local Authorities and other members of the Tees Valley Climate Change Partnership, and progress will be monitored through annual reports. Coordinating best practice in tackling climate change across the Tees Valley will increase efficiencies as well as reducing emissions.

Tees Valley Unlimited will monitor progress based on:		
The Tees Valley Statement of Ambition and the Tees Valley Multi Area Agreement	**Local Authority Climate Change Plans and Local Strategic Partnership Local Area Agreements**	**Annual reporting from the Tees Valley Climate Change Partnership**

The implementation plan also includes some medium term actions and priorities that will be delivered through Tees Valley Unlimited. In parallel to the North South Tees Industrial Framework these medium term actions will place the city region in a position to achieve challenging targets for emission reductions in the future.

All of the actions contained in the implementation plan will contribute to sustainable development in the Tees Valley, and the majority of actions in the implementation plan will have an impact on the emissions monitored under National Indicator 186 (per capita CO_2 emissions in the local area).

Other actions will contribute to progress on adapting to climate change, recycling, improving public and sustainable transport and reducing fuel poverty.

The Tees Valley Climate Change Strategy and Implementation Plan support the work of the Tees Valley Local Authorities in their commitment through the Covenant of Mayors to reduce emissions in the local area by at least 20% by 2020 from a 2005 baseline.

In the medium term, the Tees Valley Statement of Ambition will drive the transition to a high value, low carbon economy, focused on renewable energy, new technologies, biological feedstocks and reducing the carbon footprint of our existing industries.

The existing heavy industry, and the commercial and public sectors in the Tees Valley are all vulnerable to the increasing costs of complying with climate change legislation and rising energy prices. The existing housing stock needs to be rejuvenated to improve people's health as well as enhance the overall attractiveness of the city region and the provision of the resilient and reliable transport and logistical networks are vital to our future economic competitiveness.

So it is clear that most of the things we need to do to address climate change provide massive opportunities to improve our quality of life as well as our economy.

In addition to upgrading our existing buildings, regeneration schemes and new developments need to be planned and developed to ensure they perform to optimal sustainability standards, in order to place us in a strong position to attract new investment through a marketing approach that focuses on quality. The Tees Valley ambitions to drive a high value low carbon economy that is diversified and inclusive will enable us to capitalise on major new opportunities as well as improve the efficiency of our performance. We need to strengthen the understanding that climate change can be a driver for economic development and growth, not only an irrelevance or a threat.

The widespread restructuring and rationalisation that occurred as a result of the recession could create the false impression that we are 'on track' with some of our targets. The temporary emissions reductions that have been experienced in 2009/2010 as a result of the recession came with great social and economic costs, and were insignificant in reducing long term and global emissions. But climbing out of the recession offers us a critical opportunity to get it right. It is therefore crucial to realise that tackling climate change in the Tees Valley is not just about meeting targets for sake of 'being green', it is about embedding climate change adaptation and mitigation within our forward strategy. There is a lot more at stake than our environmental credentials - securing the long term quality of life for our residents, workers and visitors should be our goal.

As well as driving a low carbon economy in the Tees Valley, tackling climate change is a fundamental - albeit implicit - component of the ambition to create a diversified and inclusive economy. For example, developing expertise in sustainable design and construction will not only enable us to market the Tees Valley as a low-cost location for organisations subject to increasing carbon regulation and energy costs, but will also enable us to export these skills over the next decade when building regulations and standards will make sustainability standards mandatory. Similarly, investing in resilient infrastructure - including green infrastructure - will reduce the socio-economic and environmental costs of dealing with climate change related events such as floods and heat waves in the future.

Tackling climate change is essential to the successful delivery of the Tees Valley Statement of Ambition, and inherent to all of our economic regeneration priorities. There is sustained cross party consensus on the importance of tackling climate change, and it remains a key priority of the new coalition government. We need to understand the climate implications of all our activities and investments and work in partnership to ensure that we not only improve their sustainability, but also that we improve our access to new and innovative financing opportunities such as the government's proposed Green Investment Bank. The climate change and sustainable resource management imperatives in the Tees Valley, together with the political commitment to action, place us in a prime position to demonstrate new technologies, develop more intelligent energy systems and new ways to deliver infrastructure through Special Purpose Vehicles (SPV), Energy Services Companies (ESCO) and partnerships with utility companies and the private sector.

We recognise that this strategy has been published in a rapidly changing political environment. Our commitment and priorities haven't changed, but the way we deliver the strategy will be subject to continual review to ensure that it is fit for purpose.

Endnotes

End Note Number	Page Number Endnote Found	Source Of Information
1	7	*http://www.hm-treasury.gov.uk/d/Summary_of_ Conclusions.pdf*
2	14	*The European Union Emissions Trading Scheme (EU ETS) is a cap and trade scheme that began in 2005. It aims to reduce emissions of greenhouse gases from industrial sources across the European Union (EU). It provides for carbon dioxide (CO_2) emissions from large scale industry to be capped, by requiring companies to submit allowances sufficient to cover their verified emissions and setting a fixed total for the number of allowances issued.*
3	16	*Arup. 2009. Total carbon footprint of Stockton-on-Tees Borough Council.*
4	18	*http://www.decc.gov.uk/media/viewfile.ashx?filepath=statistics/climate_change/1_20100325084241_e_@@_ghg national statsrelease .pdf&filetype=4*
5	20	*http://www.nsp.org.uk/downloaddoc.asp?id=1480*
6	22	*http://www.nebusiness.co.uk/business-news/business-weekly-news/2007/11/27/green-er-house-is-the-right-way-to-grow-51140-20164368/*
7	23	*North East Adaptation Study*
8	23	*WTO/UNEP. 2009. Trade and Climate Change: www.unep.org/.../Trade_Climate_Publication_2289_09_E%20Final.pdf*
9	24	*The intended target is for a 42% reduction by 2020 from 1990 baseline levels. The intended target will come into force when an ambitious global emissions reduction target is agreed under the United Nations Framework Convention on Climate Change. The interim target of 34% applies until a global agreement is reached.*
10	25	*2008 Postnote on ICT: http://www.parliament.uk/documents/upload/postpn319.pdf*
11	26	*Dyer, CH., Hammond, GP., Jones, CI., McKenna. RC. 2008. Enabling technologies for industrial energy demand management. Energy Policy 36, p4434-4443*
12	26	*DEFRA. 2008. Development of an embedded carbon emissions indicator. A research report to DEFRA by the Stockholm Environment Institute and the University of Sydney.*
13	297	*North East Region fuel poverty briefing 2009: Available from http://www.nea.org.uk/publication-list/*

End Note Number	Page Number Endnote Found	Source Of Information
14	29	*2007 Sub regional housing strategy*
15	29	*2008 Tees Valley Growth Point Programme of Development*
16	30	*UK ERC. 2007. The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency.*
17	30	*EST. 2007. The Ampere Strikes Back: http://www.energysavingtrust.org.uk/Publication-Download/?p=4&pid=1085*
18	30	*North East Adaptation Study*
19	31	*The intended target is for a 42% reduction by 2020 from 1990 baseline levels. The intended target will come into force when an ambitious global emissions reduction target is agreed under the United Nations Framework Convention on Climate Change. The interim target of 34% applies until a global agreement is reached.*
20	33	*Tees Valley Footprint report 2007*
21	34	*HMRC 2009: www.hmrc.gov.uk/ria/8-landlords-energy-saving-allow.pdf*
22	36	*In many cases, developing SUDS, or 'making room for water' is a more effective way of dealing with flood risk management than developing costly hard engineering solutions. The development of SUDS can also support local biodiversity and recreation.*
23	36	*If the surface to be covered is more than five square metres planning permission will be needed for laying traditional, impermeable driveways that do not provide for the water to run to a permeable area.*
24	37	*Tees Valley Transport Monitoring Report 2008*
25	38	*Joseph Rowntree Foundation. 2008. The value of new transport in deprived areas: Who benefits, how and why?: http://www.jrf.org.uk/sites/files/jrf/2228-transport-regeneration-deprivation.pdf*
26	38	*Haines, et. al. 2009. Public health benefits of strategies to reduce greenhouse-gas emissions: overview and implications for policy makers. The Lancet, 25th November 2009, p5. The Lancet gave a figure of over $5000 a minute, which equates to over £3000 a minute at the exchange rate 0.61 as of December 2009.*

End Note Number	Page Number Endnote Found	Source Of Information
27		
28		*The intended target is for a 42% reduction by 2020 from 1990 baseline levels. The intended target will come into force when an ambitious global emissions reduction target is agreed under the United Nations Framework Convention on Climate Change. The interim target of 34% applies until a global agreement is reached.*
29		*http://www.dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt/smarterchoiceschangingtheway5769*
30		*Sustrans. 2008. Towards Transport Justice: Transport and Social Justice in an Oil Scarce Future: http://www.sustrans.org.uk/webfiles/Info%20sheets/towards_transport_justice_april08.pdf*
31		*Green Infrastructure Strategy 2008*
32		*http://www.jrf.org.uk/sites/files/jrf/2228-transport-regeneration-deprivation.pdf*
33		*p16, UK Low Carbon Transition Plan: http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx*
34		*http://www.breeam.org/index.jsp*
35		*DEFRA agricultural and horticultural survey - June 2007*
36		*Tees Valley Biodiversity Action Plan www.teesvalleybiodiversity.co.uk*
37		*http://www.bwg.naturalengland.org.uk/*
38		*DEFRA / UK Biodiversity Partnership. 2007. Conserving biodiversity in a changing climate: guidance on building capacity to adapt: www.ukbap.org.uk/Library/BRIG/CBCCGuidance.pdf*
39		*http://www.naturalengland.org.uk/Images/AE-schemes09_tcm6-14969.pdf*
40		*Modern industrial bioenergy systems involve pyrolysis and gasification - the heating of a biomass under controlled conditions to produce combustible synthesis gas ('syngas'), and oil ('bio-oil') that is burnt to produce heat, power, or combined heat and power. Biochar is a solid charred and carbon-rich by-product of combustion and offers great potential for carbon sequestration. When applied to land, biochar sequesters carbon over a longer period than simply planting trees, and has benefits in terms of soil conditioning - improving soil water retention and increased nutrient efficiency.*

End Note Number	Page Number Endnote Found	Source Of Information
41		
42		*Fairtrade products by definition are transported from other countries. However, in addition to guarantees about fair prices and community development for producers, Fairtrade principles also include compliance with environmental standards e.g. not cutting down virgin forests so there are climate change benefits associated with choosing fairtrade products.*
43		*http://www.eatseasonably.co.uk/*
44		*ERM. 2006, Impact of Energy from Waste and Recycling Policy on UK Green House Gas Emissions, Final Report for DEFRA, January 2006*
45		*Diaspora communities refer to people who are settled away from their established or ancestral home or country.*

Glossary

Adaptation	Reducing the risks and taking advantage of the opportunities associated with a changing climate.
Climate change	A change of climate directly or indirectly as a result of human activity that alters the composition of the global atmosphere in addition to natural climate variability observed over comparable time periods.
Carbon budgets	A cap on the total quantity of greenhouse gas emissions emitted over a specified time. Under the UK system of carbon budgets, every tonne of greenhouse gas emitted between now and 2050 will count. Where emissions rise in one sector, we will have to achieve corresponding reductions in another.
Carbon emissions	Carbon dioxide CO_2 is the most significant greenhouse gas in the UK and the measurement of greenhouse gases are often described in relation to their carbon dioxide equivalent CO_2e. In this strategy we have used the term 'carbon emissions' as shorthand for 'carbon dioxide emissions'.
Energy Efficiency	Efficient use of energy means that less energy can be used to provide the same level of service. For example, insulating your home will reduce the energy needed to heat it, and using efficient appliances will use less energy to operate.
EU ETS	The EU ETS is a 'cap and trade' scheme that aims to make carbon savings by allocating carbon allowances for each tonne of carbon emitted. The EU ETS sets a maximum limit or 'cap' on emissions from large industrial companies including energy generators, chemical plants and cement manufacturers, so companies that emit more than their quota have to buy allowances from companies who have emitted less than their quota.
Green Infrastructure	The environment within and between our cities, towns and villages. Green infrastructure means the network of open spaces, including formal parks, gardens, woodlands, green corridors, waterways, street trees and open countryside.
kT CO_2e	One thousand tonnes of carbon dioxide equivalent is one kilotonne or $kTCO_2e$. A thousand kilotonnes of CO_2 is one million tonnes of CO_2.

Mitigation	Reducing the amount of greenhouse gases that are released into the atmosphere to reduce their role in warming the global climate.
Resilience	The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure.
Sustainable Energy Action Plans	Through committing to the Covenant of Mayors initiative, Local Authorities have to develop Sustainable Energy Action Plans to set out how they plan to achieve emissions savings of at least 20% in their local areas.
Vulnerability	The extent of susceptibility to harm due to exposure to a perturbation or stress, and the ability (or lack thereof) to cope, recover, or fundamentally adapt.

Further Information

Business Link	www.businesslink.gov.uk/bdotg/action/layer?topicId=1080440643
Carbon Trust	www.carbontrust.co.uk
Climate Change North East	www.climatene.org.uk/
Climate Change Schools Project	www.slcne.org.uk/climatechange/
Committee on Climate Change	www.theccc.org.uk/
Connect Tees Valley	www.connectteesvalley.com/
Covenant of Mayors Initiative	www.eumayors.eu
Darlington Borough Council	www.darlington.gov.uk/default.htm
Department of Energy and Climate Change	www.decc.gov.uk/
Department of Environment Food and Rural Affairs	www.defra.gov.uk/
Energy Savings Trust	www.energysavingstrust.org.uk Customer advice line: 0800 512 012
EU Climate Change	www.ec.europa.eu/environment/climate/home_en.htm
Hartlepool Borough Council	www.hartlepool.gov.uk/site/index.php
Love food hate waste	www.lovefoodhatewaste.com/
Middlesbrough Council	http://www.middlesbrough.gov.uk/ccm/portal/
National Industrial Symbiosis Programme	www.nisp.org.uk/region.aspx?region=7
Natural England	www.naturalengland.org.uk
NEPIC	www.nepic.co.uk

North East Climate Change Partnership	www.climatene.org.uk/
Redcar and Cleveland Borough Council	www.redcar-cleveland.gov.uk/
Renew@CPI	www.uk-cpi.com/3_pages/focus/low-carbon-energy/projects/renew.htm
Resources and Energy Analysis Programme	http://www.resource-accounting.org.uk/
Stockton-on-Tees Borough Council	www.stockton.gov.uk/
Sustrans	www.sustrans.org.uk/
Tees Valley Green Business Network	www.greenteesvalley.org
Tees Valley Unlimited	www.teesvalleyunlimited.gov.uk
The Big Wildlife Garden	http://www.bwg.naturalengland.org.uk/
UK CIP	www.ukcip.org.uk
WRAP	www.wrap.org.uk

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Notes

We recognise that this strategy has been published in a rapidly changing political environment.

Our commitment and priorities haven't changed, but the way we deliver the strategy will be subject to continual review to ensure that it is fit for purpose.

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