Climate Change

Strategy for Stockton-on-Tees, 2016 - 2021

Flooding in Newtown, September 2012

“Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems.”
Intergovernmental Panel on Climate Change, 2014

Stockton-on-Tees
BOROUGH COUNCIL

Environment and Housing

Big plans for our places and open spaces

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i) Foreword

The debate about the evidence for climate change, whether human activity contributes to it, and what our collective response should be are long gone. There is a scientific consensus that our day to day activities linked to consumption of energy and fossil fuels are a major factor in the significant changes we are seeing globally, nationally and locally in our day to day weather and in particular the unusual events we have observed.

Here in Stockton-on-Tees we are already experiencing warmer and wetter winters, hotter and drier summers, and increased incidences of more extreme weather all of which have had an impact on our communities. While it is a major leap to suggest all extreme events are solely caused by climate change, there is no doubt that we all have a responsibility to ensure we act now to minimise the risk of future events happening and reduce the impact when they do.

That is why we recognise that our response to climate change must be a combination of both adapting to the impacts of severe events that we know will occur regardless, but significantly, we must dovetail this with and reducing our impact on the causes of climatic change, and that is to cut our emissions of carbon dioxide and other greenhouse gases.

This isn't new to us, and we committed nearly 16 years ago to act swiftly and set challenging targets for carbon reduction and prepare for change when we were an early Local Authority signatory of the Nottingham Declaration on Climate Change. Since then we have worked tirelessly as a Council to reduce our own emissions and better prepare our communities from extreme weather, and we have done the same in partnership with our neighbouring Tees Valley local authorities, business and other partners in tackling this challenge Borough wide. We have made tremendous progress, and now emit 18% less CO2 from Council activities than in 2012, and as a Borough our greenhouse gas emissions have fallen by 27% on a 2005 baseline.

While that's a success, it means our next challenge is even harder, which is to go further and reduce our emissions by even more and to find more innovative ways of becoming prepared for extreme events. But it's not just about the environment. We recognise that climate change is an economic growth issue and we have fantastic opportunities in Stockton-on-Tees to become leaders in low carbon technologies, large scale district heat and power, to grow our green businesses and through renewables, energy efficiency and improved resource use, support economic growth and jobs.

This strategy is our latest step in improving our own performance as a Council, showing leadership across the region and contributing to the national priority of cutting carbon, supporting economic growth, developing resilient communities and tackling climate change.

Councillor Mike Smith
Cabinet Member for Environment and Housing
Stockton-on-Tees Borough Council

ii) Executive Summary

Stockton-on-Tees has a Green Vision 'to achieve a healthy, vibrant and successful low carbon community, resilient to the challenges of climate change and resource pressures', as the overarching vision for environment, sustainability, climate change and fuel poverty. This Climate Change Strategy and Action Plan is one of the three underpinning strategies to deliver the vision.
Climate change is a large-scale, long-term shift in the planet's weather patterns[1], and human activity since the middle of 19th Century has influenced many changes and advanced many of the challenges we face today. Internationally, climate change is recognised as the greatest long-term threat to our lives, health and well-being, economy and natural environment.
As a result the response to climate challenges must be a combination of two critical factors; Climate mitigation and reducing emissions of greenhouse gases and climate adaptation; increasing the preparedness of communities and environments and reducing the impact from severe events.

National and local data analysis provides an insight into trends and potential future scenarios in Stockton-on-Tees, including hotter, drier summers, and milder and wetter winters as well as changes in extreme events, with an increase in very hot days and more intense downpours of rain during winter months.

International and national legislative drivers are progressing carbon reduction and in Stockton-on Tees, the Council and its partners have prioritised the challenge since 2002 with a number of significant and strategies and large scale carbon reduction programmes. As such between 2005 and 2015, external greenhouse gas emissions within our scope of influence were reduced by 27%, and the Council reduced its own carbon emissions by 23% during a 5 year Carbon Management Plan.

The Council currently emits 26,459 tonnes of CO_2e per annum while 2,292,400 tonnes of CO_2e are emitted from the Borough as a whole, across the sectors of domestic energy, industrial and commercial activity and road transport. Both the Council and the Borough have delivered significant projects to better prepare for future extreme events and minimise the impacts, but there is room for improvement in being a more resilient borough.

As such, we have set out seven climate change priorities on page 20 and 21 across mitigation and adaptation and, three challenging targets for emissions reduction:

- **Reduce greenhouse gas emissions from Stockton-on-Tees Borough Council activity by 21% on 2014/15 levels by March 2020**

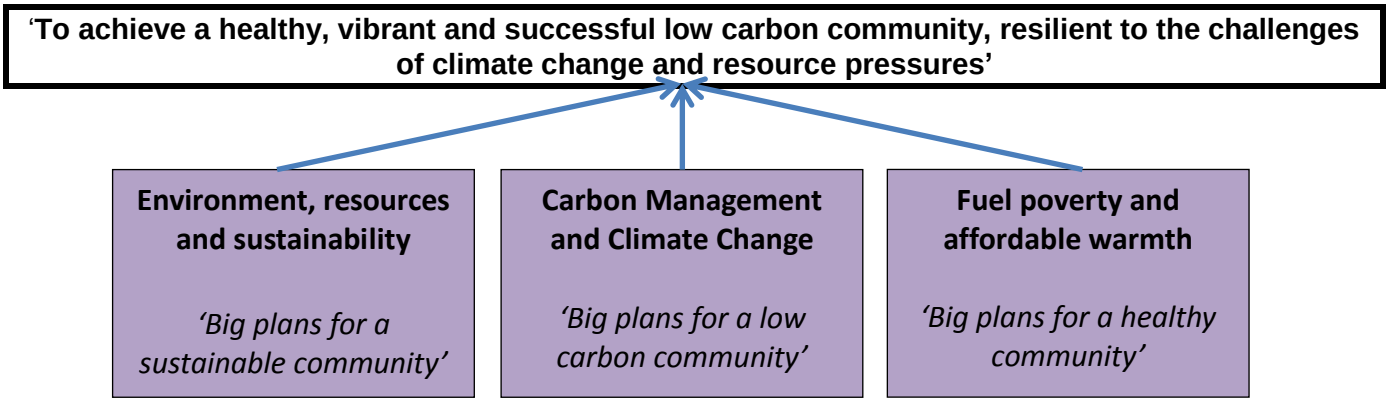
- **Reduce total greenhouse gas emissions from Stockton-on-Tees borough 18% on 2013 levels by March 2020**

- **Reduce per capita greenhouse gas emissions from Stockton-on-Tees borough by 21% on 2013 levels by March 2020**

The strategy and action plan will be reviewed annually and performance published on the Councils website and publicly available, as our response to this international challenge.

1. Our low carbon vision

Our low carbon vision for Stockton-on-Tees is:



It was developed in 2013 and forms an integral part of the Council Plan as the overarching vision for environment, sustainability, climate change and fuel poverty. It is underpinned by the three key strategic documents of the Affordable Warmth Strategy, Environment Strategy and this Climate Change Strategy, each with an action plan setting out how we will work towards achieving the vision.

Snow clearance on Stockton High Street

2. The issue

Climate change is a large-scale, long-term shift in the planet's weather patterns[1], and is a generic term used to describe temperature changes, changes in sea level, precipitation change, droughts, floods and storms. While the earth's climate and its day to day weather fluctuate over time and are influenced by natural phenomenon, the outcome of many human activities since the middle of 19th Century has influenced the changes and advanced many of the challenges we face today. This strategy is just part of our response here in Stockton-on-Tees.

2.1 What is climate change?

To begin to make sense of climate change, it's important to recognise the difference between weather and climate: -

- Weather is the temperature, precipitation (rain, hail, sleet and snow) and wind, which change hour by hour, and day by day
- Climate is the average weather we expect over a long period of time (typically 30 years and longer)

Global climate is not static, and has changed many times in response to a variety of natural causes including interactions between the seas and the atmosphere, changes in the Earth's orbit, fluctuations in energy received from the sun and volcanic eruptions. Over the past 100 years there have been observed changes in global climate, which are likely to be due to a combination of both natural and human influences. The term 'climate change' usually refers to changes that have been observed since the early 1900s, defined as:

'A change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability over comparable time periods[2]'.

Whilst the factors influencing climate change are complex and continuing, there are however significant and clear changes taking place globally and locally:

- Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen
- Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development
- Further warming will continue if emissions of greenhouse gases continue unabated.

United Nations Intergovernmental Panel on Climate Change (IPCC) 2014: 'Climate Change 2014: Synthesis Report'

Internationally, climate change has been recognised as the greatest long-term environmental threat, posing far reaching impacts upon our lives, health and well-being, our economy and natural environment. Therefore moving forward, the proactive response to the challenges presented by a changing climate must continue to be a combination of two critical factors;

- Climate mitigation: reducing emissions of greenhouse gases to prevent further change through using less energy and decarbonising existing energy use
- Climate adaptation: increasing the preparedness of communities and environments from the inevitable consequences of a changing and climate and reducing the impact from severe events

2.2 What's happening?

Changes in atmospheric concentrations of greenhouse gases (GHGs), land cover and solar radiation all combine to alter the energy balance of the climate system. GHGs allow visible and ultraviolet light in sunlight to pass through Earth's atmosphere unimpeded and reach the Earth's surface, however when light strikes the Earth's surface and is reflected back to the atmosphere as infrared energy, or heat, GHGs absorb this heat.

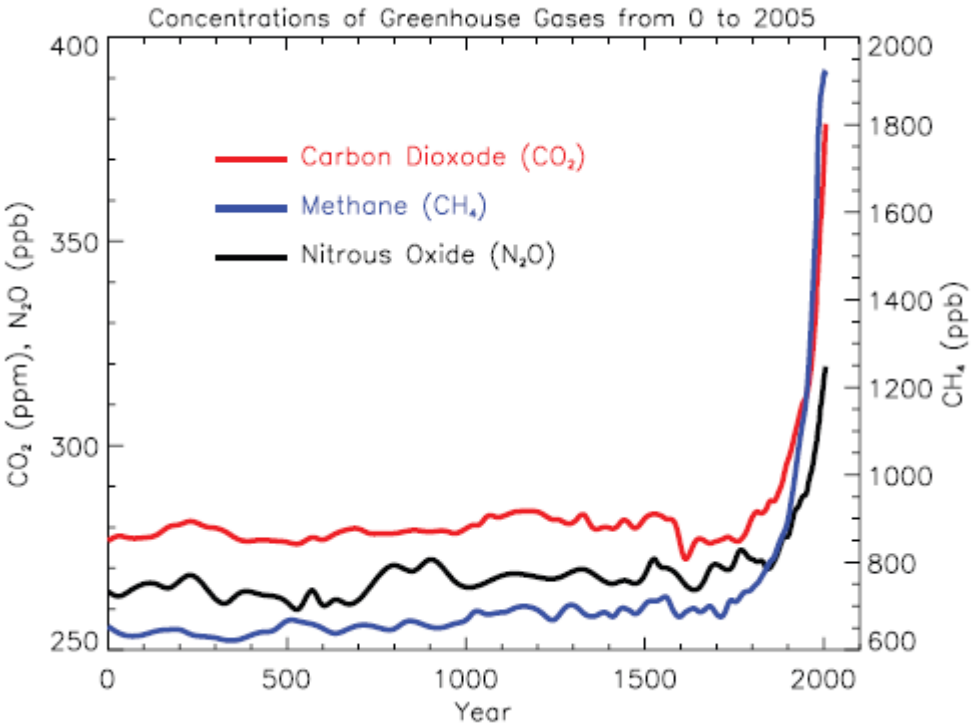


Figure1. Atmospheric concentrations of greenhouse gases, IPCC, 2007

There is indisputable evidence from the World Meteorological Organisation (WMO), the IPCC, the Met Office and the Hadley Centre that gives clarity over the correlation between increasing GHG's and a warming and more unstable climate. Data allows us to better understand likely impacts in the future and informs our actions for coping with future events. It also reinforces our collective responsibility to cut emissions.

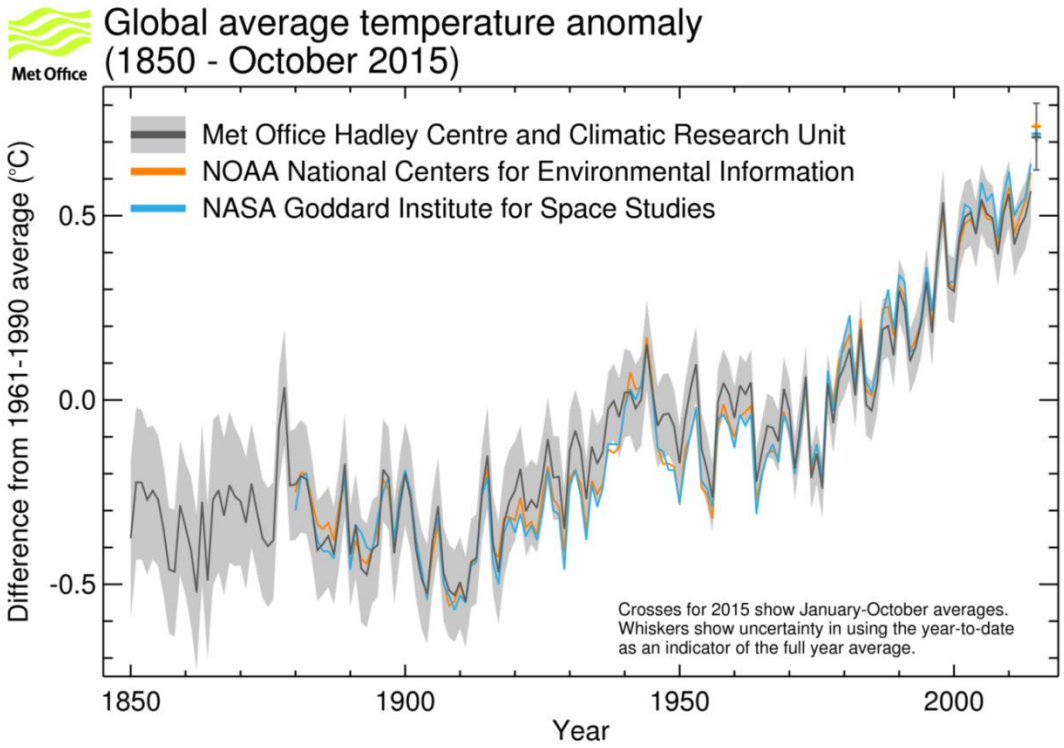


Figure 2: Global annual average near-surface temperature anomalies Source: Met Office Hadley Centre 2015

A WMO five-year analysis published in November 2015 has shown that the years 2011 – 2015 have been the warmest five-year period on record, 'with many extreme weather events , especially heatwaves, influenced by climate change'. The global average surface temperature in 2015 is likely to be the warmest on record and to reach the symbolic and significant milestone of 1° Celsius above the standard 1961-90 reference period.

Rainfall

In terms of rainfall, here in the UK there is uniform evidence of increasing average annual rainfall, however this does not show the uneven changes in distribution of rainfall across different parts of the UK.

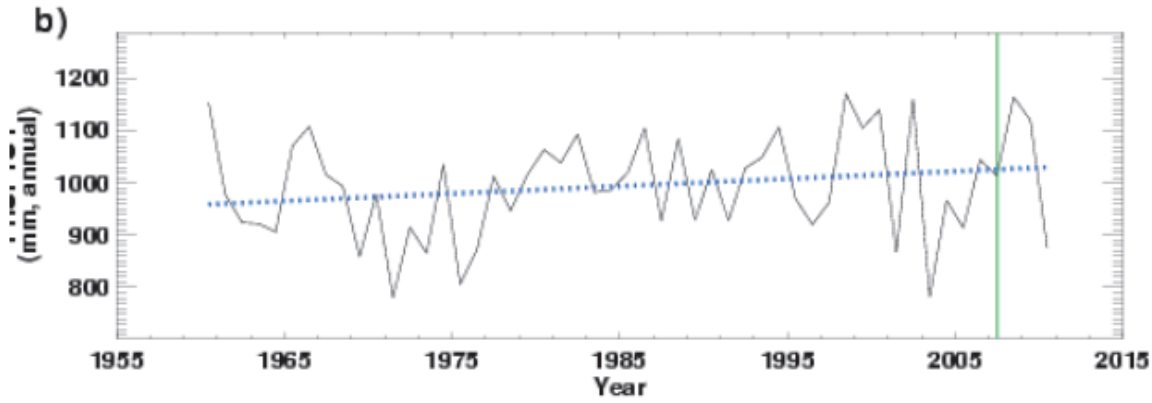


Figure 3: Change in total rainfall, 1960 – 2010: Met Office 2011

However, Met Office data recorded at Tees Valley weather stations provides a greater insight into local conditions. Average temperatures have increased locally between 1961 and 2000 across all seasons with an overall temperature increase of 0.27°C. There has been an observed average increase of 0.5ºC in summer (April – September) and 0.3ºC in winter (October – March). While these results are in line with the IPCC reports on increasing temperatures, it is slightly higher than the observed global increases of 0.15°C in winter and 0.3°C in summer.

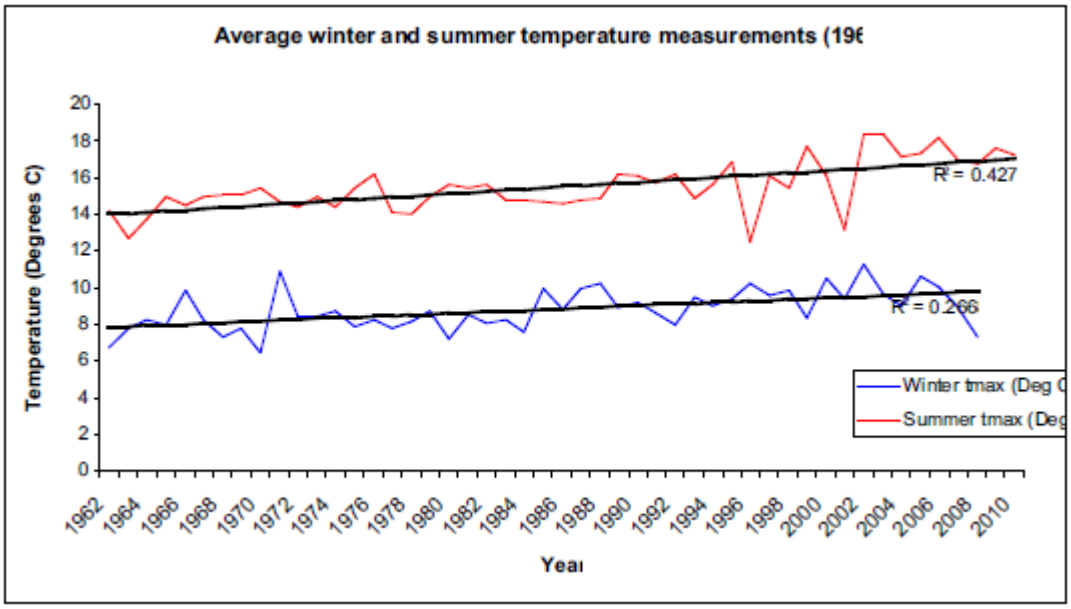
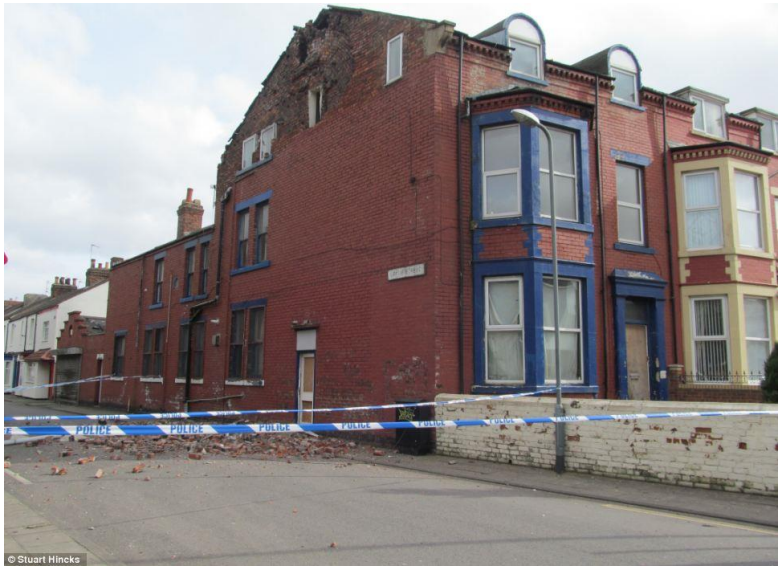


Figure 4: Average winter and summer temperatures, 1961 – 2010: Met Office 2012

The most interesting data shows that between 1961 and 2000 there has been a marked increase in the amount of rainfall received locally, with significantly marked seasonal differences. Summer rainfall has remained static over the last 50 years with just over 40mm received between April and September. However winter rainfall has doubled since 1961, with an average increase of 44mm, with over 80mm received during October to March. There are significant prolonged periods of no rainfall during summer months



Collapsed gable end on Grove Street, Stockton after storm in March 2013

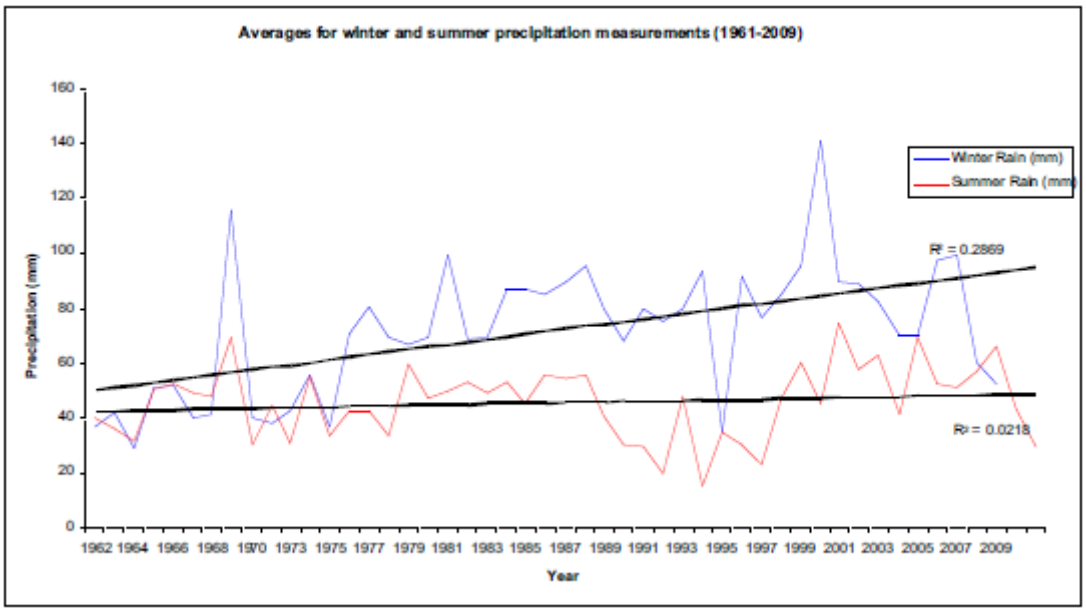


Figure 5: Average winter and summer precipitation, 1961 – 2010: Met Office 2012

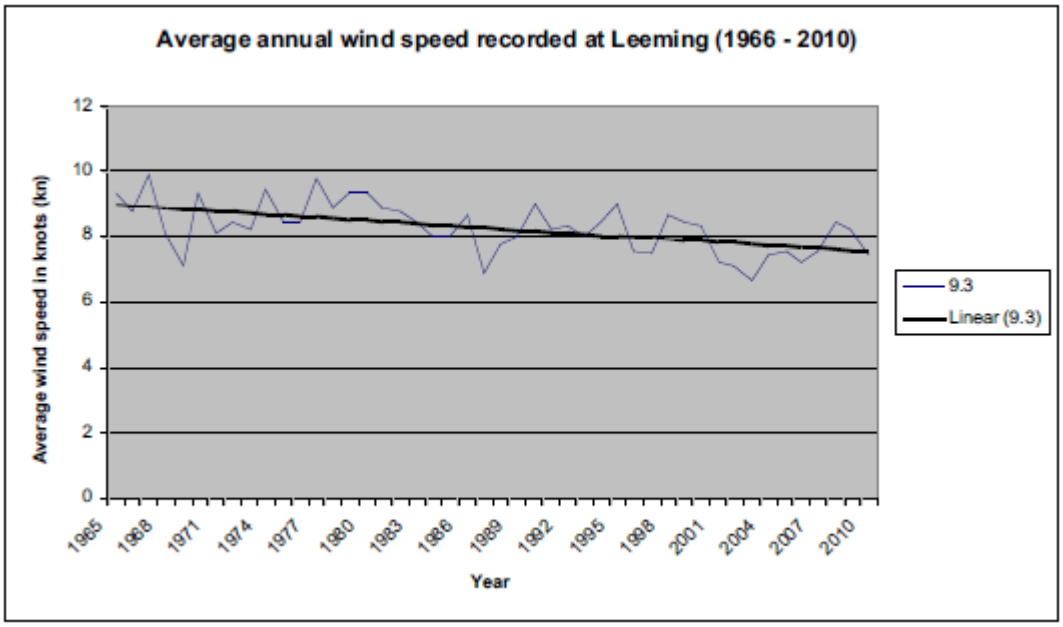


Figure 6: Average annual wind speed, 1966 – 2010: Met Office 2012

Wind

Wind speed data is less conclusive. There has been an observed decrease in average annual wind speed of approximately 1.6 knots (or 17% reduction) since 1966, while average annual maximum gust speed also slowed an observed decrease by approximately 7 knots (or 28% reduction).

The UK Climate Projections (UKCP09) provides authoritative data on future trajectories and shows three different scenarios representing high, medium and low greenhouse gas emission scenarios. Projections for the North East region for temperature and precipitation under the medium emissions scenario by 2080 show:

- an increase in summer mean temperature of 3.7°C (it is very unlikely to be less than 2°C and is very unlikely to be more than 5.8°C)

- an increase in winter mean precipitation of 14%

- a decrease in summer mean precipitation of 18%

2.3 Climate impacts

The impacts of climate change, particularly increasing temperatures, are having wide reaching consequences globally, nationally, regionally and locally, for example:

- Depletion of Arctic sea ice – Since the late 1970s there has been a general decline in Arctic sea ice extent throughout the seasonal cycle. In 2015, the daily maximum extent, which occurred on 25th February 2015, was the lowest on record at 14.54 million km2

- Rise in global sea levels – The latest estimates of global sea level indicate that the global average sea level in the first half of 2015 was the highest since satellite observations began

- Warming oceans – In the first nine months of 2015, global ocean heat content through both the upper 700 meters and 2000 meters of the oceans reached record high levels.

- The August heatwave of 2003 led to over 2,100 excess deaths in England and Wales as a direct result, with those worst affected being over the age of 75, and 21,000 premature deaths across Europe as a whole

- In 2010 the UK experienced the coldest December for more than 100 years, and the second coldest in the 352 year Central England Temperature series as mean temperatures over the UK were 5.0 °C below average, causing problems for transport, hospitals, schools and households alike

Both the UKCP09 projections and local Met Office data for the Tees Valley provide an insight into potential future scenarios such as:

- Distinctly hotter, drier summers, while winters are becoming milder and wetter
- Changes in extreme events, with an increase in very hot days and more intense downpours of rain during winter months
- Increased flooding from rivers, streams, drainage systems the sea, storm surge and coastal inundation
- Increasing threats to health and wellbeing during weather extremes
- loss of business/service productivity or community
- increased pressure on emergency services and disruption to services

2.4 What's being done?

The UK has an international target for reducing emissions through wide ranging statutory and non-statutory drivers, from global protocols to UK legislation, to mitigate and adapt to climate change including:

1997 **Kyoto Protocol** – The UN Framework Convention on Climate Change (Kyoto Protocol) was an international agreement setting legally binding targets from 2005 for 37 industrialised nations and the European Community to reduce greenhouse gas emissions

2008 **UK Climate Change Act** – The Act commits successive governments to cutting greenhouse gas emissions by 80% on a 1990 baseline by 2050 and agreeing interim 'carbon budgets' that take the country progressively towards that 80% target

2008 **Energy Act** – introduced measures to support low carbon and renewable energy technologies across all sectors, while the later Act of 2011 introduced measures to stimulate energy efficiency such as the Energy Company Obligation and Green Deal

2009 **UN Climate Change Conference** – The 'Copenhagen Accord', while not legally binding, was signed by 138 nations including the UK in support of actions to keep temperature increases to below 2^{o}c.

2011 **UK Carbon Plan** – **'**Delivering our Low Carbon Future' set out the government's plan for achieving the emissions targets set out in the first four national carbon budgets

2012 **UK Climate Change Risk Assessment** – Publication of potential impacts from climate change at a national level, and required a National Adaption Plan of how these risks would be managed to be published in 2013

2013 **National Adaptation Programme** – Set out what the government, business and the public are doing, and need to do, to better prepare for future climate risk

2015 **The UN Framework Convention on Climate Change**, 21st Conference in Paris, commits to peak emissions, and keep global temperature increase 'well below' 2^{o}c and to pursue efforts to limit it to 1.5 ^{o}c

Fundamental research and policy reviews have taken place nationally on a number of key issues in recent years such as the 'Stern Review – the economics of climate change' in 2006 and the Pitt Review – Lessons learned from the 2007 floods' to better inform national action on climate change

Policy measures largely focus on energy as the biggest source of UK emissions and the most cost–effective options for near-term emission reductions. The Committee on Climate Change set legally binding 'carbon budgets', against a 1990 baseline, in an attempt to limit greenhouse emissions towards the 2050 target as follows:

- 1st budget (2008-12) - 23% reduction (achieved)
- 2nd budget (2013-2017) - 29% reduction
- 3rd budget (2018-2022) - 35% reduction
- 4th budget (2023-2027) - 50% reduction

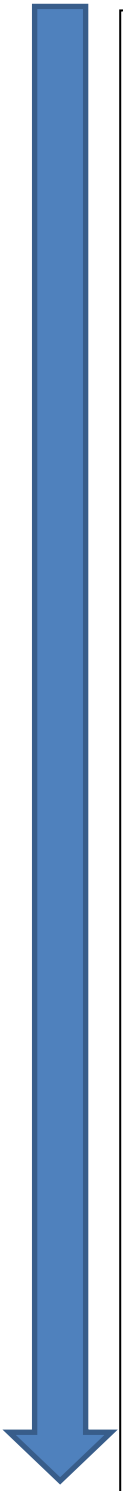
The Committee also produces 'decarbonisation pathways' showing which policies in which sectors are recommended to meet the 2050 target most cost-effectively. Broadly, these suggest:

- an early role for improving energy efficiency in homes and industry
- almost complete elimination of emissions ('virtual decarbonisation') from the electricity supply system by 2030
- an expansion of the decarbonised electricity supply so that it progressively replaces fossil fuel use in sectors such as home heating and transport

There is also an Adaptation Sub-Committee, whose role is to advise on the nation's preparedness for impacts of climate change.

3. Climate Change and Stockton

Stockton-on-Tees Borough Council has a strong tradition of leading the way in responding to the challenge of carbon reduction, tackling climate change and preparing for future scenarios. Working with partners across all sectors and the wider public, we have been publicly committing resources, setting challenging targets and delivering positive outcomes since 2002, as this timeline shows.



November 2002
Signed the Nottingham Declaration on Climate Change

May 2005
Stockton-on-Tees part of Tees Valley Climate Change Partnership inception

2007/08
Council produces its first Total Carbon Footprint of direct AND indirect emissions

2008
Council adopted its first Carbon Management Plan to reduce emissions by 25%

January 2009
Signed the European Covenant of Mayors to reduce the Boroughs emissions by 21% by 2020

2009
Published a Climate Change Action plan covering mitigation and adaptation

2009/10
Council produces its first Renewable Energy Strategy

February 2010
Council submit a Sustainable Energy Action Plan to the EU

2010
Tees Valley Climate Change Strategy published

2013
Carbon Management Plan achieves 20% reduction on 2008 emission levels

November 2013
Adopt our low carbon vision to guide future strategy

March 2015
Become 'Climate Local' signatory and commit to further carbon reductions and improved adaptation

January 2016
Adopt new Climate Change Strategy and action plan with 21% reduction on a 2014 baseline

This single strategy and action plan now replaces all previous carbon and climate change related plans and strategies listed above, and the targets contained within this strategy now supersede all previous commitments. Section 3.1 details our achievements against those objectives and targets.

3.1 Our achievements

We have achieved a great deal in both aspects of tackling climate change in cutting emissions and preparing for extreme events. While our bi-ennial HECA Report and annual Greenhouse Gas Emissions report provide more detail on our mitigation performance, here is a snapshot of our performance over the lifetime of our previous strategies.

We said: As a council we would reduce the external greenhouse gas emissions within our scope of influence by 20% by 2015 on a 2005 baseline

We achieved: A **27% emissions reduction** by July 2015

We said: We would reduce the emissions from Council activities by a challenging 25% between 2008 and 2013

We achieved: A **23% reduction** when weather corrected data was taken into account

We said: We would reduce Borough wide greenhouse gas emissions irrespective of source by 21% by 2020 on a 2005 baseline

We achieved: A **16% reduction** already by 2015

We said: We would reduce carbon emissions per head of population from the 13.8 tonnes per capita in 2005

We achieved: A **14% reduction** to 11.9 tonnes in 2013

We said: We would invest in renewable energy to reduce emissions, support the growth of the renewables sector and invest to save long term

We achieved: The installation of **29 renewable energy systems** since 2010 with a combined generating capacity of 533kWh

We said: We would commit to invest in 2500 homes with insulation and energy efficiency measures to reduce domestic carbon emissions and fuel poverty levels

We achieved: The installation of **measures to 4776 properties** since 2012. There has been a 13.1% reduction in greenhouse gas emissions in the domestic sector since 2005.

We said: We would improve resilience planning, make adaptations to reduce impact on Council services and better prepare communities for extreme weather

We achieved: Adoption of a **dedicated snow plan** in 2011, developed a **new salt barn**, trained **more staff**, invested **additional resources** to clear routes, and publish **more information**

We said: We would minimise flood risk

We achieved: Implemented a major new **Lustrum Beck flood alleviation scheme** in 2015 and develop a new borough wide **Flood Risk Management Strategy**

3.2 Where are we now?

We have significantly reduced Council and Borough wide greenhouse emissions year on year through changing behaviour, investing in new technology and wide ranging innovative projects but now we must go further. There are three elements to our current status:

- current greenhouse emissions from Local Authority activity
- current greenhouse emissions from the Borough as a whole
- level of resilience to future extreme weather events

Stockton-on-Tees Borough Council emissions

2014/15 total emissions	**26,459 tonnes of CO_2e**
CO_2e per household	**0.330 tonnes**
CO_2e per capita	**0.14 tonnes**

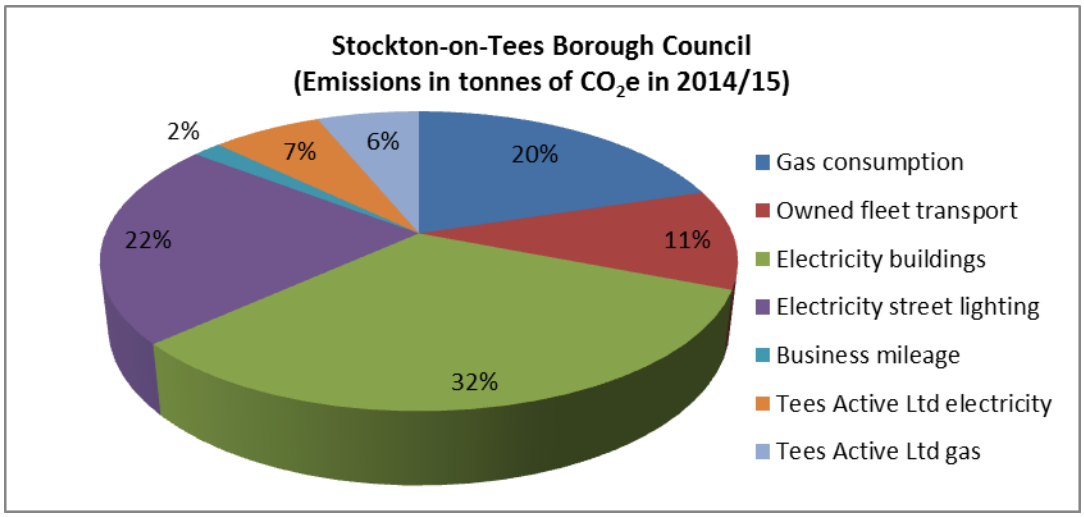


Figure 7: CO2e emissions by council activity in 2014/15

Borough wide greenhouse gas emissions
(note: Greenhouse gas emission statistics by Local Authority area are published by the Department for Energy and Climate Change each July and feature a 2 year time lag, hence 2013 data is most recent)

2013 total emissions	**2,292,400 tonnes of CO_2e**
CO_2e per household	**28.6 tonnes**
CO_2e per capita	**11.9 tonnes**

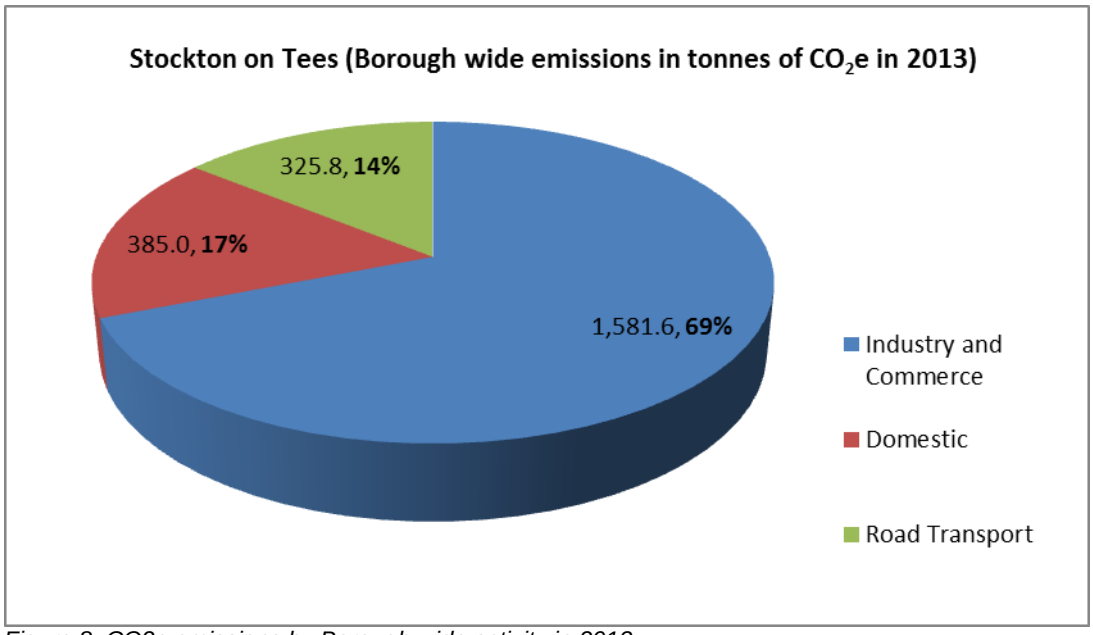


Figure 8: CO2e emissions by Borough wide activity in 2013

Resilience to severe events

- Stockton-on-Tees Borough Council Corporate Business Continuity Plan considers climate risk and severe weather
- Climate change and extreme events are a consideration in all individual Council service Business Continuity plans
- Climate Change Impact Risk Assessment undertaken in 2009
- Heatwave Plan, Snow Plan in place
- Local Flood Risk Management Strategy to be adopted in 2016

3.3 What we need to do…

This strategy sets out greenhouse gas emissions reductions targets for the period April 2016 – March 2021 for i) Stockton-on-Tees Borough Council activity and ii) Borough wide

Stockton-on-Tees Borough Council emissions

A: Reduce greenhouse gas emissions from Stockton-on-Tees Borough Council activity by 21% on 2014/15 levels by March 2020

2014/15 Baseline year	2015/16	2016/17	2017/18	2018/19	2019/20
Percentage (%) reduction needed on 2014/15 baseline	5%	10.1%	15.3%	18.4%	21%
Target net emissions figure (in tonnes)	25,136	23,787	22,411	21,591	20,903
Emissions savings in year (in tonnes)	1,323	1,349	1,376	820	688

The emissions reductions required over the coming five years represent a steep and steady trajectory with higher proportion of the 21% reduction loaded in the earlier years, recognising savings will become harder to make over time.

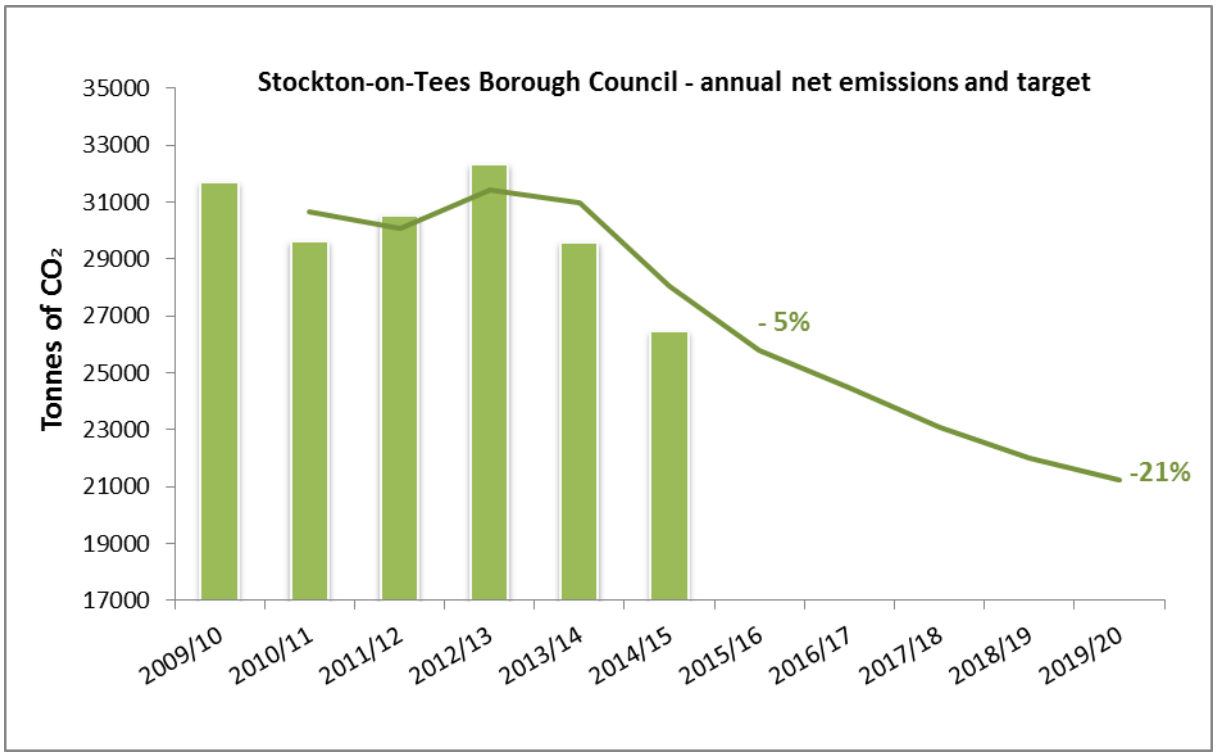


Figure 9: CO2e emissions trajectory required to meet Council's 2020 reduction target

Borough wide greenhouse gas emissions

B: Reduce total greenhouse gas emissions from Stockton-on-Tees borough 18% on 2013 levels by March 2020

2013 Baseline year	2014	2015	2016	2017	2018	2019	2020
Cumulative percentage (%) reduction needed on 2013	1.78%	3.83%	6.16%	8%	10.13%	14%	18%
Target net emissions figure (in kilotonnes per capita)	2,251.56	2,204.63	2,151.1	2,108.97	2,060.24	1,971.09	1,880.94
Emissions savings in year (in kilotonnes)	40.84	46.93	47.53	48.13	48.73	89.15	90.15

C: Reduce per capita greenhouse gas emissions from Stockton-on-Tees borough by 21% on 2013 levels by March 2020

2013 Baseline year	2014	2015	2016	2017	2018	2019	2020
Projected population	194,100	195,100	196,100	197,100	198,100	199,100	200,100
Percentage (%) reduction needed on 2013 baseline	2.5%	5%	7.6%	10.1%	12.6%	16.8%	21%
Target emissions in tonnes per capita (on 2013 baseline of 11.9)	11.6	11.3	11.0	10.7	10.4	9.9	9.4

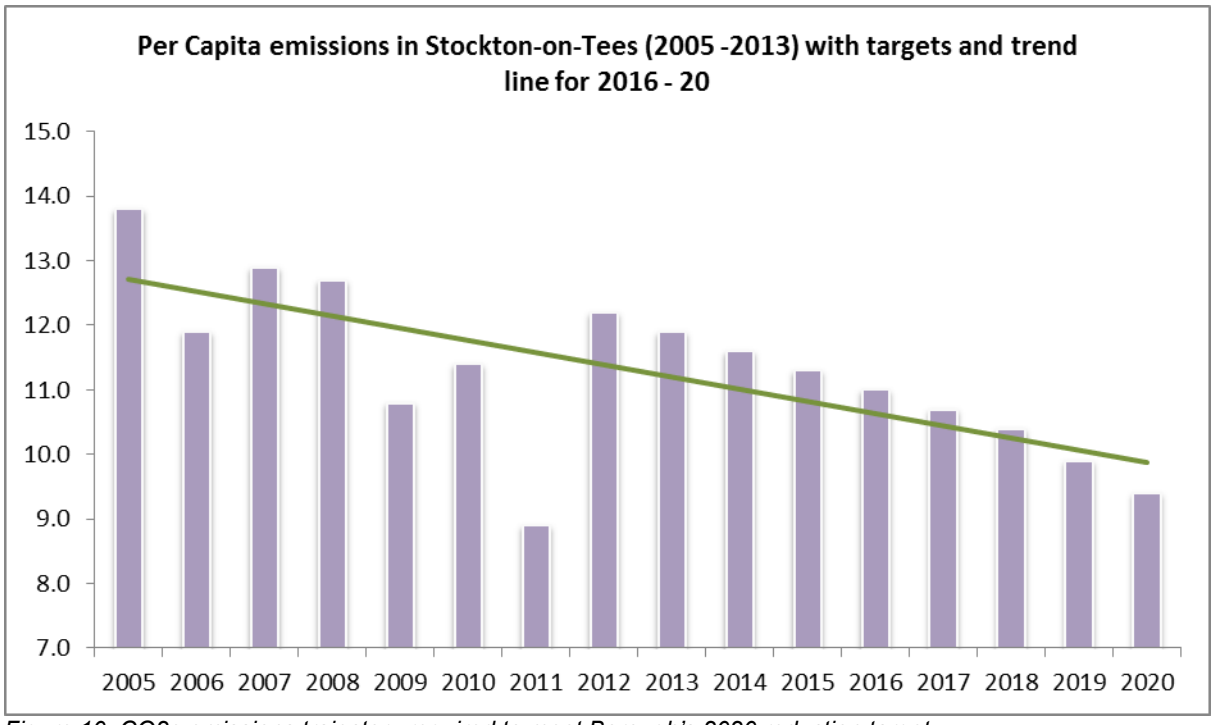


Figure 10: CO2e emissions trajectory required to meet Borough's 2020 reduction target

Preparing for flooding on Bedford Street in 2012

4. Our priorities – reducing emissions, cutting carbon
We have four distinct priorities on climate mitigation which are all aimed at significantly reducing the Borough's overall greenhouse gas emissions in order to achieve the targets set out in section 3.3.

4.1 Continuous improvement in Local Authority emissions reductions
Stockton-on-Tees Borough Council has a duty to continually drive down emissions both to ensure its contribution to tackling climate change but also to support the renewables and low carbon sector and to support local economic growth. The Council aims to make carbon reductions across all its activities.

4.2 Supporting a thriving, low carbon industrial and commercial sector
69% of the Borough's total carbon emissions are emitted from this sector alone, 1.6m tonnes per annum, and the Council will work in partnership with industry and the wider public sector to reduce consumption, decarbonise supply, stimulate large scale district heat and power networks and continue to support the growth of businesses and the low carbon economy.

4.3 Increasing the energy efficiency and warmth of all homes
Almost 20% of the Borough's emissions are from domestic properties while at the same time 11.1% of people living in Stockton-on-Tees are in fuel poverty and unable to adequately use energy to heat and light their own home. We will continue to prioritise large scale energy efficiency programmes and measures to improve affordable warmth in communities.

4.4 More sustainable travel options
Travel and transport choice have a significant impact upon greenhouse gas emissions and there is a responsibility on us all to change travel behaviour. Priorities include to invest in transport infrastructure, support the growth of alternative fuel vehicles, encourage improved travel behaviour and significant awareness raising.

600 people warned about dangerous activity on the River Tees in soaring temperatures May 2013

5. Our priorities – preparing for climate change

We have three distinct priorities on climate adaptation which are all aimed at significantly improving our understanding of the risks posed by climate change and better preparing us all to deal with the potential consequences from future extreme events.

5.1 Mapping the risk and ensuring business continuity

Forewarned is forearmed. Being able to contingency plan for climate change and what the impacts could be on the Borough is entirely dependent on mapping what the likely impacts are going to be locally and undertaking a thorough assessment of the risk. This enables us to prioritise our response, implement appropriate actions and thus reduce the vulnerability of Stockton-on-Tees.

5.2 Strategic planning for climate adaptation

We must develop stronger long term policies in preparing for the local impacts of climate change and embed these across all council plans and strategies, particularly spatial plans. We will renew our focus in strategic planning to ensure appropriate locations for future infrastructure and new development, will further develop Building Design Guidance and strengthen Flood Risk Management so that the impacts on communities in future are minimised.

5.3 Being prepared and protecting communities

Stockton-on-Tees is increasingly seeing the consequences of extreme and unexpected weather events which impact on communities, the services that are provided, transport infrastructure and economic growth. These events will continue to take place and although the way we respond to protect people and places has improved significantly, such as implementing a dedicated Snow Plan or a flood relief scheme, we will identify new ways to protect vital communities and infrastructure.

Flooding on Burnside Grove in 2012

6. Action plan

Objective 1: Continuous improvement in Local Authority emissions reductions				
Ref	**Activity**	**Lead**	**Outcome**	**Target date**
1.1	Develop a new Council Carbon Management Plan of actions covering electricity and gas use, street lighting, travel, leisure and fleet management actions	Environment Policy	Reduction in greenhouse gas emissions from council activity in line with targets on page 17	Plan agreed by July 2016
1.2	Explore potential for introducing ISO 50001 Energy Management System across all sites	Maintenance and Facilities Services	Identification of energy saving opportunities	By March 2017
1.3	Develop and implement a Council Energy Policy	Environment Policy and Maintenance & Facilities Services	Energy embedded in Council's policy framework	By September 2016
1.4	Review of Sustainable Procurement Policy, and strengthen to ensure maximum contribution to reducing emissions in supply chain	Environment Policy / Procurement & Governance	Improve sustainability of supply chain and reduce scope 3 emissions	By December 2016
1.5	Work in partnership with Tees Valley Unlimited and neighbouring local authorities to share best practice and identify potential cross boundary mitigation schemes	Environment Policy	Identification of emissions saving opportunities	Annually

1.6	Develop Council 'joined up' projects such as linking renewable energy generation, EV infrastructure and greening the fleet	Environment Policy / Fleet Management	Reduction in greenhouse gas emissions and financial sustainability	By December 2016
1.7	Deliver an intensive carbon reduction behavioural campaign across the Council and roll out its success across the Borough	Environment Policy	Reduction in energy consumption and lower carbon emissions	2016/17
1.8	Publish annual Greenhouse Gas Emissions Report and publicly report on progress	Environment Policy	Public declaration of targets and progress	Annually each July
1.9	Publish bi-ennial HECA Report and publicly report on progress against fuel poverty, SAP ratings, council emissions and Borough wide emissions targets	Environment Policy	Public declaration of targets and progress	March 2017 March 2019
1.10	Maintain active partnership with Climate Local	Environment Policy	Public declaration of commitments and progress	Continuing March 2017 Continuing March 2019
1.11	Actively participate in annual Earth Hour initiative	Environment Policy	Public commitment	19th March 2016 and subsequently each year

Objective 2: Supporting a thriving, low carbon industrial and commercial sector				
Ref	**Activity**	**Lead**	**Outcome**	**Target date**
2.1	Develop the Borough's District Energy Masterplan to 2050 and business plan and model for delivery	Capital Programme & Projects	Development of deliverable business model for carbon reduction	Autumn 2016
2.1	Implement District Energy scheme in line with masterplan and business plan	Capital Programme & Projects	Significant carbon reduction from commercial sector from use of waste energy	2019
2.3	Investigate additional opportunities for shared energy generation across the Borough and provide support and guidance where necessary	Environment Policy	Carbon reduction through reduction in energy consumption	Continuing
2.4	Provide support to the industrial and commercial sector to access guidance and resources on energy efficiency, carbon reduction and renewable energy	Environment Policy	Carbon reduction through reduction in energy consumption	Continuing
2.5	Investigate opportunities to develop low carbon skills, education, training and employment opportunities	Environment Policy, Business Development and TVU	High skills base in low carbon sector	Continuing

2.6	Deliver the Big Community Switch scheme in Stockton on Tees and make available for SME's to tariff switch	Environment Policy		Autumn 2016 and annually thereafter
2.7	Roll out a Borough wide communication campaign	Environment Policy	Behaviour change and resulting carbon reduction	2017
2.8	Work with all major developers to identify opportunities for incorporating sustainable design and low carbon technologies	Environment Policy	Improved energy efficiency and carbon reduction from new developments	Continuing

Objective 3: Increasing the energy efficiency and warmth of all homes				
Ref	**Activity**	**Lead**	**Outcome**	**Target date**
3.1	Support residents to improve the energy efficiency of their homes via energy advice partnership projects, and advice and guidance schemes	Environment Policy & Fuel Poverty Policy	Improved domestic energy efficiency and increase in the Borough's average SAP rating	Continuing
3.2	Identify and work with partners to explore future opportunities for housing retrofit including insulation, renewables, boilers and other energy efficient measures	Environment Policy & Fuel Poverty Policy	Reduction in emissions from domestic housing sector and improved domestic energy efficiency	Continuing
3.3	Continue to work with registered housing providers to progressively increase the energy efficiency of social housing stock	Environment Policy & Fuel Poverty Policy	Reduction in emissions from domestic housing sector and improved domestic energy efficiency	Continuing
3.4	Commissioning voluntary sector partners to provide advice and guidance to residents and groups on reducing energy consumption, collective switching and other such schemes	Environment Policy & Fuel Poverty Policy	Reduction in emissions from domestic housing sector, improved domestic energy efficiency, improved financial sustainability	Projects identified by July 2016
3.5	Support work with Private Sector Landlords to see improvement in private rented sector housing stock	Environment Policy and Housing	Reduction in emissions and improvement in housing standards	Continuing

3.6	Work in partnership with developers to deliver high standards if sustainability including sustainable construction methods and might levels of energy efficiency	Environment Policy	Improved domestic energy efficiency of new build developments	Continuing
3.7	Work in partnership with developers, landlords and architects to share knowledge and good practice on sustainable construction and energy efficiency and apply principles in new development	Environment Policy	Improved domestic energy efficiency of new build developments	Continuing
3.8	Promote low carbon and renewable energy provision in new development, wherever possible, and embed in Local Plan policies	Environment Policy & Spatial Planning	Improved domestic energy efficiency of new build developments	By December 2016
3.9	Explore potential external funding routes for Borough wide energy efficiency, affordable warmth and low carbon projects	Environment Policy	Improved energy efficiency of existing developments	Continuing
3.10	Deliver Affordable Warmth Strategy, and actions contained within it such as the Big Community Switch, to tackle fuel poverty	Environment Policy & Fuel Poverty Policy	Improved access to Affordable Warmth and reduction in fuel poverty	Review of Affordable Warmth Strategy September 2016
3.11	Develop an online portal for residents to share good practice and learn from each other on energy efficiency, tariff switching and measures to reduce consumption and bills	Environment Policy	Increased awareness and reduction in domestic fuel consumption	By March 2017

Objective 4: More sustainable travel options				
Ref	**Activity**	**Lead**	**Outcome**	**Target date**
4.1	Develop and deliver an Employee Travel Plan including promoting and incentivising alternative methods of transport for Council business, including explore potential car share scheme	Transport Policy	Reduced greenhouse gas emissions from transport	July 2017
4.2	Ensure through planning policy that new developments are served by high quality and frequent public transport provision as well as making provisions for cycling and walking	Transport Policy	Reduced greenhouse gas emissions from private car use	Continuing
4.3	Continue to invest in public transport, cycling and walking infrastructure to reduce private car use	Transport Policy	Reduced greenhouse gas emissions congestion, travel time, and improved air quality	Continuing
4.4	Support low emission vehicle infrastructure where possible including potential for securing external funding from EU and Office of Low Emission vehicles	Transport Policy & Environment Policy	Reduced greenhouse gas emissions from transport sector	Continuing
4.5	Work at strategic level with the rail industry through operators and Rail North to promote rail use and improve facilities to and at stations	Transport Policy	Increased rail patronage, reduced car use and reduced carbon emissions	Continuing

Objective 5: Mapping the risk and ensuring business continuity				
Ref	**Activity**	**Lead**	**Outcome**	**Target date**
5.1	Deliver a full risk assessment of the impact of severe weather events on Council service delivery and the Borough's communities	Environment Policy	Identification of local climate risks. Priorities for action identified	September 2016
5.2	Incorporate priority risks from action 5.1 into Council's Corporate Risk Register and Business Continuity Plan, together with identification of adaptation actions to be undertaken to minimise risk and impact	Procurement & Governance	Improved preparedness for the impacts of extreme weather	December 2016
5.3	Work in partnership with GIS Information Management to map climate risk and use a layered system to identify the most vulnerable people and assets	Environment Policy / GIS	More informed and evidenced based response to vulnerable people and assets in extreme events	March 2017
5.4	Work with the Local Resilience Forum to ensure effective plans to respond to climate risks and severe weather events	Environment Policy	Improved preparedness and response to extreme events	September 2016
5.5	Ensure consideration of climate risks in all Council strategic plans and strategies	Environment Policy	Improved preparedness and response to extreme events and improved strategic planning	Continuing as strategies are revised and developed

5.6	Promote learning and outcomes on climate change adaptation with all stakeholders and communities	Environment Policy	Improved awareness of extreme events	Continuing

Objective 6: Strategic planning for climate adaptation

Ref	Activity	Lead	Outcome	Target date
6.1	Ensure policies embedded in Local Plan support adaptation to Climate Change including appropriate spatial planning, improved building design, incorporating SuDS.	Environment Policy & Spatial Planning	Risks minimised from the effects of extreme events	By March 2017
6.2	Ensure Sustainable Design Guide Supplementary Planning Document (SPD) reflects current evidence and priorities in adapting to climate change and extreme events	Urban Landscape & Spatial Planning	Risks minimised from the effects of extreme events	By March 2017
6.3	Implement the Boroughs Green Infrastructure Strategy	Urban Landscape	Improved preparedness and resilience to extreme events	Continuing
6.4	Investigate potential for cross boundary partnership project on upland planting to reduce water volume in downstream Stockton rivers and tributaries	Urban Landscape & Highway Network Management	Risk of downstream flooding minimised	By March 2017
6.5	Ensure Borough's open spaces and green infrastructure are future proofed for severe weather events and long term climate change	Care For Your Area and Urban Landscape	Increased resilience to extreme events	Continuing

6.6	Provide materials on climate adaptation and resilience awareness programme to support Eco Schools programme across the Borough	Environmental Policy	Raised awareness of future climate and events	By July 2017

Objective 7: Being prepared and protecting communities

Ref	Activity	Lead	Outcome	Target date
7.1	Maintain accurate and up to date Strategic Flood Risk Assessment (SFRA) for the Borough	Highway Network & Flood Risk Management	To provide an assessment of flood risk at key development and regeneration locations across Stockton Borough	Continuing
7.2	Maintain accurate and up to date Flood Plan	Highway Network & Flood Risk Management	Improved co-ordinated approach	Continuing
7.3	Develop and deliver a Local Flood Risk Management Strategy for the Borough	Highway Network Management Team	Improved strategic flood risk management	April 2016 for strategy
7.4	Work with Local Resilience Forum to improve preparedness through Tees Valley wide partnership working	Highway Network Management Team	Improve resilience and community resilience	Continuing
7.5	Explore opportunities to install Sustainable Urban Drainage Systems on Council property and open space as part of new developments (SuDS)	Highway Network Management Team	Improved surface water management taking account of water quality (flooding), water quality (pollution) and amenity	Continuing

7.6	Increase properties in vulnerable areas registered with EA Flood Alerts	Environment Policy & Highway Network Management Team	Improved community awareness and preparedness	Continuing
7.7	Improve distribution and awareness of Borough's Heatwave Plan and provide advice to residents on reducing health risks in heat wave events	Environment Policy & Public Health	Protect vulnerable individuals in events of extreme temperatures	Continuing
7.8	Ensure accurate and up to date Snow Plan	Care For Your Area	Improved preparedness and response in severe snowfall events	Continuing

7. Monitoring and review

We will:

- continually the monitor the mitigation and adaptation actions contained within this strategy
- assess their impact and performance
- regularly and publicly report performance via a number of means

Annual performance updates on the Council's carbon reduction efforts will be reported via the annual Greenhouse Gas Emissions report submitted to Department for Energy and Climate Change (DECC), as well as annually to Climate Local, while detailed updates on energy efficiency, domestic energy reductions and fuel poverty will be publicly reported via the HECA report.

An annual assessment of the action plan will be undertaken and presented to the Council's Place Committee and Cabinet. All progress reports will be published on the Council's website.

8. Contact

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This report can be found at the following link: https://www.stockton.gov.uk/environment-and-housing/climate-carbon-and-energy/

Appendix 1: Abbreviations

CO_2	Carbon Dioxide
DECC	Department for Energy and Climate Change
EU	European Union
GHG	Greenhouse gas
HECA	Home Energy Conservation Act
IPCC	Intergovernmental Panel on Climate Change
UKCP	United Kingdom Climate Projections
WMO	World Meteorological Organisation

Appendix 2: References

1 Met Office (2015); 'What is climate change?', www.metoffice.gov.uk
2 IPCC (2007); 'IPCC Fourth Assessment Report: Climate Change 2007'