EAST RIDING OF YORKSHIRE COUNCIL

CO234

East Riding of Yorkshire Council's Climate Change Strategy

Looking to the future

Government, business and individuals will need to work together to realise the aims in this climate change strategy. There are many drivers from government in the form of policies, regulations, incentive schemes and economic measures. It is not always realised that many of the changes required to tackle climate change lead to better homes, more efficient businesses and schools, healthier lifestyles, improved transport and strengthened local economies. Moreover, energy efficient services for residents are cheaper to run. In a moderately warmer climate new opportunities for rural businesses and agriculture emerge. Tackling climate change need not be about what we can't do but what we can do, differently and better.

What might be happening in 2012?

- Climate change risks and opportunities are understood by all. Climate change is an issue we can all engage with. Residents, Business and the Council are all aware of climate change risks, what is being done and more importantly how each can play their part.
- Significant changes to how new developments are built in the East Riding will be being made. This will include high energy efficiency buildings and rainwater harvesting.
- East Riding of Yorkshire Council has shown leadership in implementing several projects that make emissions cuts whilst also saving the authority energy and therefore money.
- There is a strong network of businesses committed to reducing their environmental impact.
- Local food is now a much bigger feature of our diet. Allotment spaces have been opened up and more people are enjoying growing their own food.
- Community groups are much more involved in climate change; there is an upsurge of positive, solution type activity from church groups to village halls.
- Agriculture in the East Riding is starting to prepare for a warmer climate; new crops are being trialled and, though the East Riding has no vineyards just yet, new opportunities are enabling farms to diversify.

What might 2020 look like?

We hope to populate this section with the views of residents and our partners. We will undertake a consultation with residents and community groups to determine our vision for 2020. We know we need a much altered economy with far more local production, low carbon technologies, ultra efficient homes, green jobs and business but need to know the views of our residents to form our 2020 vision of a low carbon East Riding. This exercise will be undertaken throughout 2010-11

1.0 Introduction

1.1 East Riding of Yorkshire Council is committed to protecting the environment for our residents today and for generations to come. This strategy commits the council to achieving a 34% reduction in our carbon footprint by 2020. The Environmental Policy (signed in 2006) has been fully implemented, and in 2007, the Council signed the East Riding Environmental Footprint Pledge (our version of the Nottingham Declaration) committing us to take action on climate change. In 2009, the council achieved registration to the Eco Management Audit Scheme (EMAS), the international gold standard in environmental management.

1.2 This climate change strategy takes our commitment to tackling climate change further and details how we expect to cut the carbon footprint of the Council, adapt our services to a changing climate, and lead the county towards a low carbon future. Climate change is a global issue and it is a human one. The warming of the planet is accelerated by humans and humans will feel the consequences. Climate change is already affecting life in the East Riding. The weather patterns are changing and sea-levels along the coast and in the Humber Estuary are slowly rising. The impacts of climate change will continue and become more and more apparent over the coming decades.

1.3 At this stage, when the impacts of change are only just beginning to be felt, it would be easy for us to choose to ignore the situation and continue with business as usual. The consequence of this would be to lose time in making vital adaptations to the way we live. Inaction would also discourage others to take climate change seriously, resulting in much less action to moderate the severity of climate change and reduced ability for managing the impacts.

1.4 The alternative is to collectively address the issue, guard against the negative effects of climate change and adapt to the climate change we are already committed to in a positive and creative way.

1.5 This strategy aims to guide our work on the issue of climate change, how it will impact on us here in the East Riding and what we are able to do about it. This strategy only briefly explains the causes of climate change as East Riding of Yorkshire Council has signed up to the East Riding Environment Footprint Pledge recognising that man made climate change is occurring. Therefore this strategy will concentrate on the reduction of emissions of these gasses from the Council's operations as well as adapting the services the council provides to cope with a changing climate. In most cases this means the Council saves money and resources which are needed for services to residents. This strategy will also address the actions the council will take to mitigate emissions from residents, business and other public bodies and the adaptation measure which will affect the whole county. In this way the strategy deals with both internal and external climate change issues.

1.6 There have been many developments in recent years that warrant a refreshed climate change strategy. This strategy will be reviewed at least every 3 years with action reviews every year. This will ensure the strategy stays up to date with current science and national policy.

2.0 The Science of Climate Change

2.1 Climate Change is caused by the release of "greenhouse gases" into the atmosphere.

The international agreement at Kyoto led to targets for the reduction of the following six main greenhouse gases;

Carbon Dioxide (CO2)
Methane (CH4)
Nitrous Oxides (NOx)
Hydrofluorocarbons (HFC)
Perfluorocarbons (PFC)
Sulphur Hexafluoride (SF6)

2.2 The warming of the atmosphere does not necessarily mean the weather where we live will become more pleasant. The climate is a profoundly complex system which is very difficult to understand on a global level. What we do know is that our climate is directly linked to almost everything we do from how we build our homes to what food we eat. Facing an uncertain climate future East Riding of Yorkshire Council is working with the most sophisticated science available to plan for the future. Figure 1 demonstrates the basic process of the 'greenhouse effect' which is driving climate change.

Figure 1
Increasing concentrations of greenhouse gases are changing the climate

Source: Met Office (2009)

3.0 The Policy Background

3.1 National

3.1.1 Much of the national policy and science is about numbers. If we carry on as normal we would see a 6°C rise in temperature. This may not seem like much but it would in fact render vast amounts of the world uninhabitable. We know this cannot be allowed to happen so internationally governments are trying to set targets which will hold the amount of greenhouse gasses in the atmosphere to a level that will mean we will only experience an average global temperature rise of 2°C.

3.1.2 To do this, Britain has calculated that it must cut its emissions by 34% by 2020 and 80% by 2050. This is an enormous task, but achievable if we work together and strategies like this one succeed. This strategy is designed to fit with national and regional policy where appropriate but take into account the diverse needs of the East Riding.

3.1.3 If the world continues emitting greenhouse gases like carbon dioxide at today's levels, then average global temperatures could rise up to the 6°C mark by the end of this century. This is enough to make extreme weather events like floods and drought more frequent and increase global instability, conflict and the spread of disease. Mass migration of people to levels beyond any of our recent experience would be commonplace and food shortages will be part of everyday life. Heat waves, droughts, and floods would affect the UK too. To avoid the most dangerous impacts of climate change, average global temperatures must rise no more than 2°C, and that means global emissions must be significantly reduced by 2020 and fall to at least 80% below 1990 levels by 2050.

3.1.4 In order to halt climate change at 2°C deep cuts in greenhouse gasses have to be made. The 2008 Climate Change Act commits the UK government to reduce Carbon Dioxide emissions by 80% of those emitted in 1990. These binding emissions targets mean the UK must have a clear roadmap to a low carbon economy. On the 15th July 2009 the Department for Energy and Climate Change released the UK Low Carbon Transition Plan, a 'National strategy for climate and energy'

3.1.5 This White Paper sets out the UK's transition plan for building a low carbon UK: cutting emissions, maintaining secure energy supplies, maximising economic opportunities and protecting the most vulnerable.

3.1.6 This strategy also has links to other national strategies such as Food 2030, Future Water and Waste Strategy 2007. East Riding Council is working with the Agricultural sector, Yorkshire Water and other partners to ensure priorities on food, water and waste are accounted for in delivering our services to residents and businesses.

3.2 Regional

3.2.1 At a regional level, the Regional Spatial Strategy and the Regional Economic Strategy set the priorities for spatial planning and economic growth within the region. This strategy is designed to reflect these priorities. The 'Climate Change Plan' for Yorkshire and the Humber demonstrates the principles for regional and local leaders, and for decision makers in all sectors of what we require to help the region adapt to climate change, and to reduce our contribution to its causes. It covers areas where discussions with regional and local stakeholders suggest that

current work and programs on their own will not deliver the outcomes required and joint action will be needed.

3.3 Local Emergency and Business Continuity Planning

3.3.1 Most of the work the council undertakes will be affected by climate change in some way. This strategy aims to compliment and enhance local priorities in transport planning, development management, housing provision, waste management, coastal management, delivery of frontline services and risk assess those areas we feel are most at risk from a changing climate. We will also work with partners and residents to identify their concerns and how we can work together on innovative local solutions.

3.3.2 This Climate Change Strategy aims to support the national low carbon transition plan, regional strategies and local priorities by committing East Riding of Yorkshire Council to reducing its own CO2 emissions by 34% equivalent by 2020 in line with national policy.

4.0 Climate Change Projections

4.1.1 It is important to understand the impacts climate change will have locally. As mentioned above the government is trying to limit emissions to a level where we will only see 2°C of warming. The scenarios below are projections for the 2080s nationally and the 2050s locally. Even with success in reducing global emissions to the 2°C level we will see significant changes to our weather patterns. This means we will have to adapt the way we live and the services the council provides to deal with extreme weather, water shortages and food security. We can expect hotter drier summers and wetter warmer winters. Summer heat-waves like to one of 2003 which caused many thousands of deaths across Europe and in the UK will be more frequent and there will be a greater risk of floods.

4.1.2 In 2009/10 the UK experienced a very cold winter, this was caused by an area of high pressure over the UK which blocked the Gulf Stream (warm air currents from the Atlantic ocean that keep the UK warmer than other countries of similar latitude) and led to weeks of very cold weather. During this cold spell in the UK, Canada was experiencing a record warm winter which complicated the 2010 winter Olympics. This highlights the global nature of the climate system and how a general warming trend across the globe might not mean every year is going to be warmer than the next in the East Riding. Uncertainties like these in local conditions mean we have to rely on projected trends into the future, such as the trends proposed by the UK Climate Projections (UKCP09)

4.1.3 The United Kingdom Climate Projections 2009 are a series of predictions of future climate trends put together by the countries leading climate scientists. UKCP09 has been created to help the UK to plan for a changing climate. The projections contain information on observed and future climate change, based on the latest scientific understanding.

4.1.4 The projections show higher temperature increases and more severe impacts than previously predicted in shorter timescales. UKCP09 is the fifth generation of climate information for the UK, and is the most comprehensive package produced to date. For the first time it provides projections of climate change supported by probabilities of events occurring. The projections highlight the range of climate changes that the UK may experience in future and the extent to which these are supported by the latest evidence. They help to give us the evidence to make informed decisions to prepare for a changing climate. The projections show how future climate could change dramatically. They provide data for three future scenarios of greenhouse gases;

low, medium and high. Below the medium emissions scenario is used. The medium emissions scenario is not business as usual and will require a great deal of effort to achieve.

4.2 Key Findings

4.2.1 The key findings from UKCP09 suggest how our climate might change.

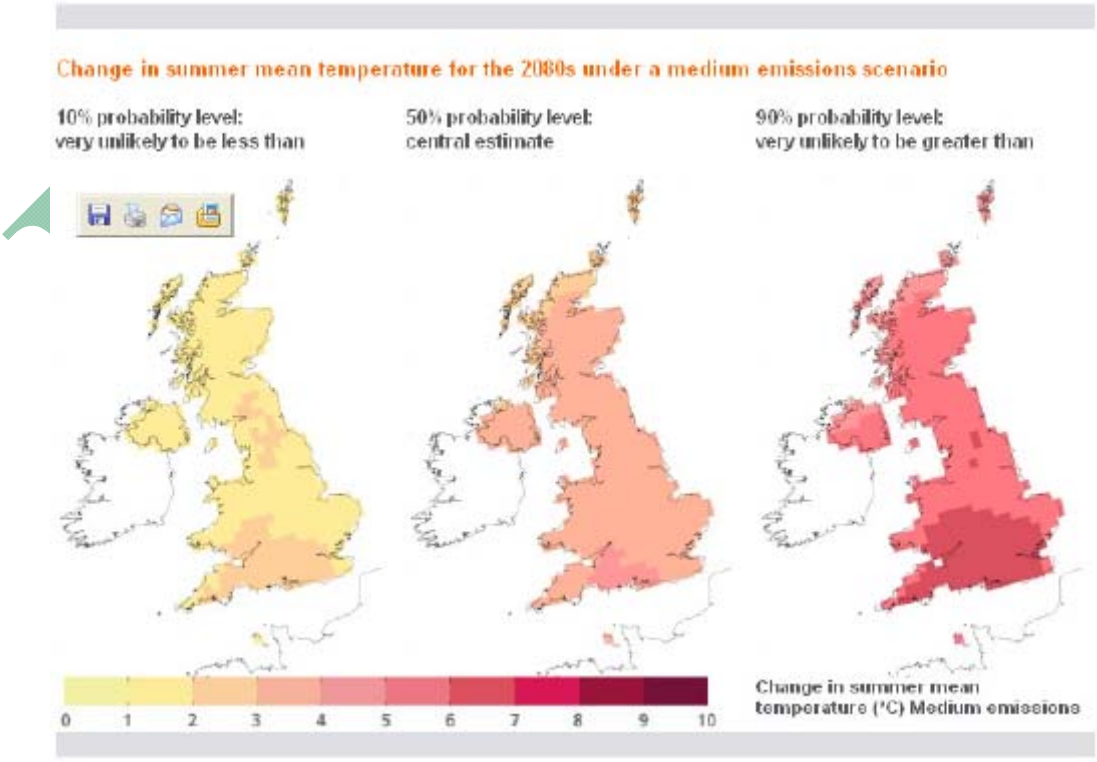
- All areas of the UK get warmer, and the warming is greater in summer than in winter.
- More rain will fall in the winter, with drier summers for much of the UK.
- Increasing potential for tidal flood impacts with rising sea levels and more frequent storm events

4.3 Key findings for Yorkshire & Humber in the 2080s

4.3.1 The key findings for each region of the UK are shown in the report for the 30-year period from 2070-2099 (called the 2080s) under a medium emissions scenario, and for summer and winter temperature and precipitation. Medium emissions scenarios (Medium SRES A1B storyline IPCC) are based on continuing economic growth but moving to a society using much more renewable resources.

4.3.2 It is worth noting here that this is not 'business as usual' and will require significant effort just to realise the medium emissions scenario. 'Business as usual' will result in significantly higher temperatures and more severe impacts. The findings are also presented on maps such as Figure 2 below which shows the projected change in summer temperatures into the future under a medium emissions scenario.

Figure 2: A medium emissions scenario for the UK.



Medium emissions scenario (2080s) for Yorkshire and the Humber

- Under medium emissions, the central estimate of increase in winter mean temperature is 2.9ºC.
- The central estimate of increase in summer mean temperature is 3.3ºC,
- Under medium emissions, the central estimate of change in winter mean rainfall is +15%
- The central estimate of change in summer mean rainfall is –22%

4.4 Key Findings for the East Riding, 2050's.

4.4.1 The Yorkshire and Humber Climate Change Adaptation Study Local Area Report (East Riding of Yorkshire District) also released in 2009 predicts climatic changes up to 2050 and goes further in describing how these changes will affect the way we live. The projected changes up to 2050 for the East Riding are:

- Annual average daily mean temperatures are expected to rise by 1.9°C with summer temperatures rising more (by 2.5°C)
- Winter rainfall will, on average, increase by 16%;
- Extreme cold temperatures will increase, and extreme hot temperatures will rise by 1 - 3.2°C; and
- The number of days of snowfall will reduce by 70%
- Summer rainfall will, on average, decrease by 24%
- Overall annual rainfall will decrease (by 4-5% approx)

4.5 Most significant vulnerabilities or opportunities to the East Riding

4.5.1 Below are outlined the likely impact of these climatic shifts, and the most significant vulnerabilities and opportunities to the East Riding leading up to the 2050s. Included are those impacts that have a direct link to our local authority operations and responsibilities. Action now can save higher costs for adaptation later.

4.5.2 Flooding

- Greater winter rainfall and more episodes of extreme rainfall in the summer leading to increasing and more frequent flood incidents for local properties, businesses and infrastructure in main towns;
- Higher groundwater recharge rates, particularly in the local chalk aquifers, producing increased base flows and groundwater levels and further increasing winter flood risk;
- Increasing potential for tidal flood impacts with rising sea levels and storm surges;
- Increased erosion and more frequent breaching of historic defences as a result of sea level rise.

4.5.3 Economy and society

- Climate change will affect the reliability of food supply chains and water availability. This will increase costs to consumers and lead to shortages of food and water.
- A new study by the University of East Anglia estimates that fish stocks will migrate north by 40km every decade for the next 50 years. This may have a significant impact on our coastal towns and the fisheries industry.

- Climate refugees from the southern countries of the EU may bring renewed pressure on housing, services and labour markets.
- Tourism could increase and infrastructure will be required to cope with increased visitor numbers. However, the nature of coastal tourism may have to adapt to the effects of coastal change, such as coastal squeeze.
- Businesses will need to be fully equipped to respond to the challenges and opportunities of environmental change (and the requirements of environmental compliance regulations) in order to be competitive in the marketplace.

4.5.4 Agriculture

- Risks to agriculture from changes to the growing season, droughts and floods, increased heat stress in livestock and more storm damage.
- Increased risks from pests and diseases.
- There may be opportunities to exploit growing different crops and increasing yields
- Potential increased risk of flooding of low lying agricultural land

4.5.5 The natural environment

Yorkshire is very much on the bio-geographical cusp between the warmer and drier lowlands of Eastern England and the cooler and wetter north and west. Key issues relating to climate change and biodiversity in the East Riding are summarised as follows:

- Rising sea levels resulting in loss of valuable habitats and changes in habitat type;
- Rapidly eroding coastline resulting in loss of valuable habitats;
- Locally fragmented semi-natural habitats making them susceptible to further isolation and species extinctions.

4.5.6 Transport infrastructure

- Road surfaces may need to be more heat resilient to cope with higher projected summer temperatures.
- Alternative routes may need to be found or existing routes protected for road and rail infrastructure; and sea defences may need to be provided to prevent strategic routes from being damaged by coastal erosion.
- Climate change is likely to affect UK ports in particular with extreme weather or rising sea levels resulting in flooding and possibly disrupting operations. In addition, ports on the east coast may face an increased risk from storm surges. To reduce these risks port operators may need to, for example, change the height and configuration of harbour walls and their drainage.
- Capacity of drainage may need to be increased to safeguard transport routes.
- More frequent repairs to road and rail corridors in response to wider temperature ranges and damage from weathering.

4.5.7 People

All the impacts above and below have an effect on people but specific impacts will be:

- Urban heat islands will develop in towns. This was serious enough in the 2003 to contribute to 2000 premature deaths in the UK and 14000 in France. The predictions suggest this will become far more common, and will need to be addressed in spatial plans, amongst other strategies including public health.
- People will be more attracted to live and work in a well adapted community. Communities that are designed to deal well with heat waves and water stress are likely to prosper.

4.5.8 Buildings

Offices are more likely to overheat as a result of warmer summer temperatures. Methods of passive cooling, such as the use of blinds and external shading, will be needed so as not to increase the reliance on air conditioning, which will increase energy consumption.

- Premises may be exposed to increased risk of flooding due to higher winter rainfall levels and an increased frequency of extreme weather.
- There will be increased risk of subsidence – the summer of 2003 saw claims of £400 million for subsidence.

4.5.9 The wide range of impacts shown above represent diverse challenges to the way services are delivered. The main message is that climate change can no longer be thought of as only affecting overseas nations or vulnerable wildlife. Climate change poses very real challenges to the way in which we live our lives and how services are delivered into the future.

4.5.10 In section 7 below the adaptation actions the Council feels are appropriate and necessary are explained by taking each of the bullet points above and explaining the actions that are taking place and plans for the future.

5.0 Mitigation and Adaptation

5.1 There are two clear approaches needed to tackle climate change. Firstly, do everything possible to reduce the amount of greenhouse gasses in the atmosphere and play our part in limiting warming to 2°C.

5.2 Secondly, understand and acknowledge what impacts a 2°C rise in temperature will have and ensure we adapt accordingly. These two approaches are known as mitigation and adaptation. East Riding of Yorkshire Council will also take a role in communicating climate change issues to residents and partners in the public and private sector.

5.3 This strategy comprises three parts. The actions we will take to mitigate our own greenhouse gas emissions, and the action we will take to ensure we use the latest projections to adapt to a changing climate and awareness raising. The actions below will be subject to annual review.

6.0 Part 1 Mitigation

6.1 In order to avoid the worst effects of climate change we must reduce the amount of greenhouse gasses we are responsible for. Most of the mitigation actions that relate directly to the Council also save money. Energy efficiency is a priority for the Council to ensure its buildings and services are not wasting energy or natural resources. By signing the East Riding Environment Footprint Pledge, the Council promised to publicly declare a significant reduction of greenhouse

gas emissions from our own authorities operations. The national target for greenhouse gas reductions is 34% by 2020 and 80% by 2050. As this strategy covers the period from 2010 to 2020 East Riding of Yorkshire Council makes a clear pledge to reduce its own emissions by 34% by 2020.

6.2 NI185

6.2.1 National indicators are targets local government must report on to central government. They cover many services from childcare to leisure facilities. National indicator 185 is an environmental indicator and part of the governments drive to cut carbon emissions nationally. It relates the amount of CO2 emitted by council activities. It is broken up into buildings using mainly gas and electricity and transport in table 1 below.

Table 1, East Riding of Yorkshire Council Carbon footprint

Stationary Sources:						
Description	Category	-	Energy Type	Units (KwH, KM, Litres, etc)	CO2 Emissions	% of total
Community Centre	Community Assets	-	Natural gas	876,860	162,193	0.32%
Council - Care Homes	Community Assets	-	Natural gas	1,416,058	261,928	0.51%
Council - Libraries	Community Assets	-	Natural gas	1,361,204	251,782	0.49%
Council - Town Halls	Community Assets	-	Natural gas	47,597	8,804	0.02%
Day Centre	Community Assets	-	Natural gas	1,019,380	188,555	0.37%
Depot	Other operational buildings	-	Natural gas	1,582,050	292,632	0.57%
Housing	Community Assets	-	Natural gas	952,126	176,115	0.35%
Leisure Centre (Dry)	Community Assets	-	Natural gas	771,430	142,691	0.28%
Leisure Centre (Lrg Pool)	Community Assets	-	Natural gas	19,239,209	3,558,676	6.98%
Office - No AirCon Cellular type1	Other operational buildings	-	Natural gas	6,470,151	1,196,784	2.35%
Office - No AirCon OpenPlan type 2	Other operational buildings	-	Natural gas	241,869	44,739	0.09%
Other	Other operational buildings	-	Natural gas	372,324	68,869	0.14%
School - Primary (no pool)	Schools	-	Natural gas	14,984,858	2,771,749	5.43%
School - Secondary (with pool)	Schools	-	Natural gas	5,460,635	1,010,054	1.98%
School - Secondary (no pool)	Schools	-	Natural gas	17,242,279	3,189,304	6.25%
Other	Schools	-	Natural gas	646,418	119,568	0.23%
Car Park - open	Other operational buildings	-	Electricity (grid)	149,071	77,964	0.15%
Community Centre	Community Assets	-	Electricity (grid)	302,680	158,301	0.31%
Council - Care Homes	Community Assets	-	Electricity (grid)	194,560	101,755	0.20%
Council - Libraries	Community Assets	-	Electricity (grid)	1,135,150	593,681	1.16%
Council - Museums	Community Assets	-	Electricity (grid)	100,595	52,611	0.10%
Council - Town Halls	Community Assets	-	Electricity (grid)	316,615	165,589	0.32%
Day Centre	Community Assets	-	Electricity (grid)	317,684	166,148	0.33%
Depot	Other operational buildings	-	Electricity (grid)	1,498,911	783,928	1.54%
Housing	Community Assets	-	Electricity (grid)	803,580	420,271	0.82%
Leisure Centre (Dry)	Community Assets	-	Electricity (grid)	411,614	215,273	0.42%
Leisure Centre (Lrg Pool)	Community Assets	-	Electricity (grid)	6,742,386	3,526,255	6.91%
Leisure Centre (Sml Pool)	Community Assets	-	Electricity (grid)	114,622	59,947	0.12%
Office - No AirCon Cellular type1	Other operational buildings	-	Electricity (grid)	4,694,141	2,455,026	4.81%
Other	Other operational buildings	-	Electricity (grid)	2,879,079	1,505,752	2.95%
Housing streetlights (kWh)	Community Assets	-	Electricity (grid)	14,238,856	7,446,893	14.60%
School - Primary (no pool)	Schools	-	Electricity (grid)	8,110,331	4,241,687	8.32%
School - Secondary (with pool)	Schools	-	Electricity (grid)	3,230,732	1,689,666	3.31%
School - Secondary (no pool)	Schools	-	Electricity (grid)	9,559,680	4,999,694	9.80%
Other	Schools	-	Electricity (grid)	307,607	160,878	0.32%
School - Primary (no pool)	Schools	-	Burning oil	19,324	4,740	0.01%
Other	Schools	-	Burning oil	21,482	5,270	0.01%
Community Centre	Other operational buildings	-	Burning oil	900	221	0.00%
Other	Other operational buildings	-	Burning oil	3,000	736	0.00%
Other	Other operational buildings	-	Gas oil	10,502	2,641	0.01%
Council - Town Halls	Community Assets	-	Gas oil	8,683	2,183	0.00%
Community Centre	Community Assets	-	Gas oil	15,202	3,823	0.01%
School - Primary (no pool)	Schools	-	Gas oil	651,087	163,722	0.32%
Other	Schools	-	Gas oil	24,153	6,074	0.01%
School - Secondary (with pool)	Schools	-	Gas oil	80,623	20,273	0.04%
School - Secondary (no pool)	Schools	-	Gas oil	939,185	236,167	0.46%
Transport						
Description	Category	Energy Type	Journey Type	Units (KwH, KM, Litres, etc)	CO2 Emissions	% of total
Fleet 1: Other Diesel	Diesel	Fuel	Fleet	196,718	517,447	1.01%
Fleet 2: Refuse trucks or road sweepe	Refuse trucks or road sweepers (rigid size)	Lorry	Fleet	259,823	683,438	1.34%
Fleet 3: Gardening and Grounds Maint	Gardening and Grounds Maintenance - Diesel	Fuel	Fleet	28,658	75,382	0.15%
Fleet 4: Small diesel car up to 1.7 litre	Small diesel car, up to 1.7 litre or under	Car	Fleet	8,002	1,206	0.00%
Fleet 5: Medium diesel car, from 1.7 to	Medium diesel car, from 1.7 to 2.0 litre	Car	Fleet	119,763	22,527	0.04%
Fleet 6: Large diesel car, over 2 litre	Large diesel car, over 2.0 litre	Car	Fleet	35,319	9,307	0.02%
Fleet 7: Small diesel van (≤1.25t)	Small diesel van (≤1.25t)	Car	Fleet	333,151	59,278	0.12%
Fleet 8: Medium/Large Diesel Van (>1.	Medium/large diesel van (>1.25 ≤3.5t)	Car	Fleet	3,493,941	956,431	1.87%
Fleet 9: HGV Rigid >3.5t-7.5t	HGV Rigid >3.5-7.5t	Lorry	Fleet	3,726,441	2,097,672	4.11%
Fleet 10: HGV Rigid >7.5t-17t	HGV Rigid >7.5-17t	Lorry	Fleet	1,722	1,286	0.00%
Fleet 11: HGV Rigid >17t	HGV Rigid >17t	Lorry	Fleet	26,991	26,160	0.05%
Fleet 12: Other Petrol	Petrol	Fuel	Fleet	100,269	232,163	0.46%
Fleet 13: Refuse Truck/Sweepers	Refuse trucks or road sweepers (rigid size)	Lorry	Fleet	26,482	69,658	0.14%
Fleet 14: Gardening and Grounds Mai	Gardening and Grounds Maintenance - petrol	Fuel	Fleet	125,831	291,349	0.57%
Other Business Mileage	Average car (unknown fuel)	Car	Business	14,945,757	3,101,245	6.08%
Hire Car mileage 1	Small diesel car, up to 1.7 litre or under	Car	Business	25,115	3,785	0.01%
Hire Car mileage 2	Small diesel van (≤1.25t)	Car	Business	2,105	375	0.00%
Hire Car mileage 3	Medium/large diesel van (>1.25 ≤3.5t)	Car	Business	6,218	1,702	0.00%
Trains	Rail - national rail	Rail	Business	2,471,945	148,811	0.29%
				Total	51,010,834	100%

6.2.2 Table 1 above shows the Councils Carbon footprint in 2008/9 to be 51,010 tonnes CO2 per year. This strategy commits the council to reduce this figure by 34% by 2020. This would take our annual carbon footprint to 33,666 tonnes per year. The baseline year for the UK government's 34% target is 1990, as East Riding council was established in 1996 the Kyoto baseline is not relevant. Though the Council has measured its carbon footprint before the methodology above is approved nationally and will remain the method for measuring our

emissions for the foreseeable future. We believe that by adopting 2008/9 as our baseline year we have set a ambitious but achievable target. Clearly this means we must make deep cuts in the Council's carbon emissions and maintain the same level of service to residents.

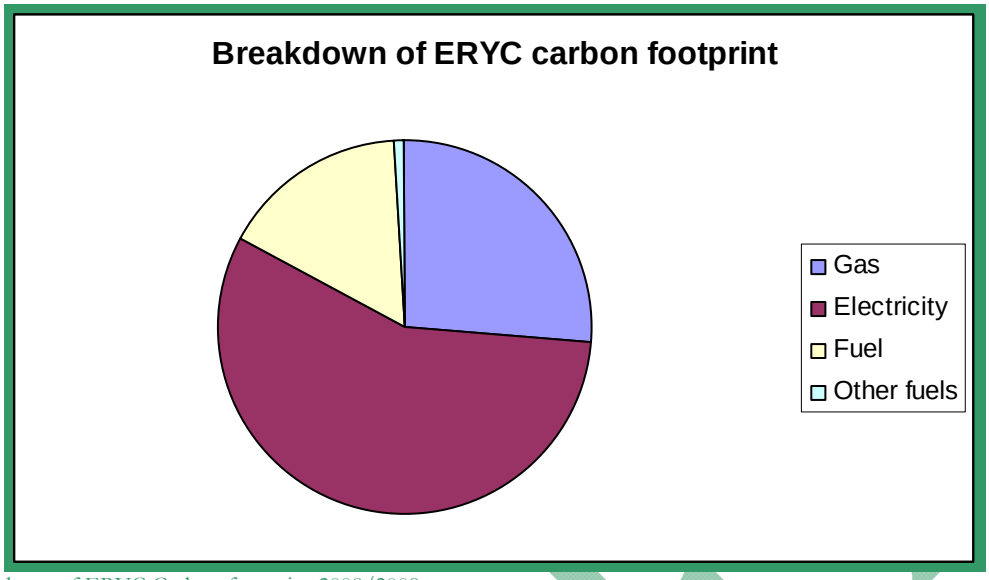


Fig 2 Breakdown of ERYC Carbon footprint 2008/2009

6.2.3 Though challenging, a mix of changing behaviour, investing in renewable technologies and implementing energy efficiency initiatives can reduce our emissions significantly. Each area identified above has a part to play. Large consumers such as street lighting at 14.6% of our carbon footprint will enjoy research and investment in order to bring about large reductions using energy efficient equipment and managing demand. By saving on electricity we also save money and deliver our services more efficiently. Our business miles (6.08% of our carbon footprint) can be addressed making more use of video/telephone conferencing, using public transport and using low emission pool cars.

6.2.5 The schools of the East Riding cumulatively account for 36.49% of our CO2 Emissions. Investment in school buildings and a programme of schools engagement in energy is urgently required to drive this figure down.

6.3 The Carbon Reduction Commitment

6.3.1 From 2011/12 there will be a mandatory price to pay for each tonne of carbon the Council emits under the Carbon Reduction Commitment Energy Efficiency Scheme (CRCEES). It is reported that the annual cost of these allowances to the Council (based on the projected carbon emissions for 2010/11) would be in the region of £0.350m. In order to ensure we get best value out of the Carbon Reduction commitment we need to find ways of reducing our carbon footprint through energy efficiency measures. This reduction will contribute towards our 34% target stated above.

6.4 East Riding as a whole and NI186

6.4.1 Though reducing the Council's carbon footprint will contribute to an overall reduction in emissions, residents, public sector organisations and business must work together to achieve significant reductions. National indicator 186 is a measure of the total emissions of all activity in the East Riding. The data is collated by the Department of Energy and Climate Change and is summarised in table 2 below:

Table 2, emissions summary of the East Riding of Yorkshire

County	Year	Industry and Commercial	Domestic	Road Transport	Total	Population ('000s, mid-year estimate)	Per Capita Emissions (t)
East Riding of Yorkshire	2005	989 KtCO2	881 KtCO2	696 KtCO2	2,566 KtCO2	329.2	7.8
	2006	1,409 KtCO2	876 KtCO2	678 KtCO2	2,963 KtCO2	330.9	9.0
	2007	1,423 KtCO2	851 KtCO2	682 KtCO2	2,956 KtCO2	333.0	8.9

6.4.2 Table 2 Shows emissions at 8.9 tonnes of CO2 per head in 2007. This is above the average figure of 8 tonnes and is falling slower than in other areas. Below the 'Mitigation Action Plan' sets out the headline interventions the Council intends to make over the coming years to reduce its own carbon footprint and that of the county as a whole.

6.4.3 Though the headline emission reduction in this plan is a 34% reduction of emissions from our own operations, out target for the emissions of the county as a whole is also 34% Reduction on 2007 levels. In this however we are excluding those emissions from industrial and commercial operations as these emissions are covered under other national government programmes such as the European Union Emissions Trading Scheme and the Carbon Reduction Energy Efficiency Scheme. This means the East Riding can continue to compete for inward investment and jobs whilst pursuing real emissions reductions.

6.4.4 Excluding Industrial and commercial emissions leaves Domestic and road transport emissions totalling 1533KtCO2 in 2007. A 34% reduction in emissions by 2020 would require a reduction of 521 KtCO2 on 2007 levels. In appendix 1 the mitigation action plan sets out the interventions and programmes that the council can take to make progress towards this target.

6.5 Mitigation Action Plan

6.5.1 In order to reduce our carbon footprint to 33,666 tonnes per year we will need a coordinated action plan across council services. This will include investments in energy and fuel efficiency, more sustainable travel options, changes to the way we deliver services and behavioural change across our employees. Reducing the emissions of the county as a whole means ensuring a high quality of life is maintained but decoupling this from rising emissions. In order to achieve these goals a mitigation action plan is outlines in Appendix 1. The mitigation, adaptation and awareness raising action plans will be internally reviewed annually to ensure they keep pace with the science and changing issues over time. The council also works with the Energy Saving Trust to give staff opportunities to reduce their carbon footprint at home and at work.

7.0 Part 2 Adaptation

7.1.1 Due to the emissions already in the atmosphere and those we will be responsible for even with effective mitigation, it is likely we will see an average global temperature rise of somewhere

between 1.5 and 2 degrees. The impacts of this temperature rise will be felt locally and were demonstrated by UKCP09 conclusions above. Some of these impacts will relate directly to the way we live day today and as such, the services the council delivers will also be affected.

7.1.2 National Indicator 188 focuses on adapting to climate change. The rationale behind the indicator is to ensure local authorities are sufficiently prepared to manage risks to service delivery, the public, local communities, local infrastructure, businesses and the natural environment posed by a changing climate and to make the most of new opportunities. The indicator measures progress on assessing and managing climate risks and opportunities.

7.1.3 The impacts of climate change might include increases in flooding, temperature, drought and extreme weather events. These could create risks and opportunities such as: impacts to transport infrastructure from melting roads or buckling rails, increases in tourism, increased damage to buildings from storms, impacts on local ecosystems and biodiversity, scope to grow new crops, changing patterns of disease, impacts on planning and the local economy and public health.

7.1.4 Ni188 requires the council to take account of the likely climate impacts predicted and plan to adapt to them using a risk based approach. This process will be managed through the council's environmental management system and reported in the annual environmental statement.

7.1.5 With regard to the impacts set out above each impact affecting residents must be planned for and high levels of service maintained. Specific adaptation projects will be implemented using the council's existing environmental management system. Specific actions will be reported in the annual environmental statement.

7.2 Local Development Framework

7.2.1 Below the headline climate impacts from UKCP09 are used as a framework to outline the actions that are being and will be taken over the period of this strategy. In many cases the Local Development Framework (LDF) is referred to as a key tool for managing adaptation. The East Riding LDF comprises five Development Plan Documents (DPD):

- Core Strategy
- Allocations
- Bridlington Area Action Plan
- Joint Minerals
- Joint Waste

7.2.2 Over the next 15-20 years, the LDF will manage the area's growth, guide investment decisions, and set wide-ranging policies aimed at achieving 'sustainable development' against which planning applications for new housing, commercial, and all other types of development will be determined. This places the LDF in a key position to manage climate change adaptations in new developments at the design and planning stage.

7.2.3 Below are the main areas of risk the council feels it faces along with residents. We are committed to adequate and timely planning to tackle each of these impacts and to identify opportunities where necessary

7.3 Adaptation Actions

7.3.1 The actions below use the headlines from UKCP09 to demonstrate the current actions and future plans for climate change adaptation in the East Riding

7.3.2 Flooding

- Greater winter rainfall and more episodes of extreme rainfall in the summer leading to increasing and more frequent flood incidents for local properties, businesses and infrastructure in main towns;
- Higher groundwater recharge rates, particularly in the local chalk aquifers, producing increased base flows and groundwater levels and further increasing winter flood risk;

7.3.2i Flood risk Management

The flood events of 2007 were devastating to the East Riding community, most significantly to the 6. 2000 households that were flooded with water reaching inside the properties affecting the economic livelihood of the region's commercial and agriculture sector, numerous businesses and over 12, 500 hectares of land were covered by flood water.

The Overview Management Committee agreed a review of the events be undertaken as a priority. The scope for the review panel was agreed by that Committee on 7th September 2007. The report of the Flood Review Panel was published in May 2008 outlining the findings of the panel and made 60 recommendations to improve water management, the flood resilience of the Authority and the responsiveness to future emergencies.

The review made recommendations requiring action by most organisations involved in water management and emergency recovery. Actions were recommended for the Environment Agency, Yorkshire Water, Internal Drainage Boards and Parish Councils as well as the Local Authority. Recommendations were also made for changes in the operation of water management at a national level.

Thirty six of the recommendations involved action by the local authority. Some of these recommendations were open-ended, requesting continual monitoring and maintenance of the drainage infrastructure. At the time of writing all 36 recommendations are either in progress or have been completed (11). Four actions had still to be confirmed and two were addressed by responding to the Flood and Water Bill.

Progress has been made on the co-operation of the relevant authorities. There has been an improved level of consultation and exchange of information. The Multi – Agency Operational Liaison Group has proved very successful in identifying and rectifying local flooding issues. However, there is further work to be done to improve communication and an understanding of water management activities.

The Council has also engaged in extensive work alongside progress on the Flood Review Panel's recommendations including numerous bids for funding, responding to national, regional proposals and prioritising investment for communities, setting up responsive systems to community requests, monitoring systems for early identification of risk etc. These are some of the areas of work that have resulted from the findings of the Flood Review Panel and the subsequent Flood Resilience Board.

In planning future growth, the LDF may seek to minimise climate change vulnerability by directing development away from areas expected to be most susceptible to its impacts, such as by avoiding areas that are likely to be at increased risk of flooding and/or coastal erosion. This would not be possible in all cases (i.e. within existing settlements such as Goole that already lie within an area of high flood risk), but the LDF could aim to ensure

that new development (and re-development of existing land uses) in vulnerable areas is designed to a standard that is resilient to flooding events, storms, and other impacts.

For example, the LDF can require buildings to incorporate 'flood-proofing' measures, such as raised internal floor levels and raised electrical wiring, so that they can quickly be returned to use after a flood, reducing the impact on property and businesses. In terms of surface water flood risk, LDF policy could require new developments to incorporate sustainable urban drainage systems, such as retention ponds, swales, soake-aways and/or porous paving, to ensure that the increased risk arising from additional hard surfaces is minimised.

Catchment Flood Management Plans (CFMPs) are strategic level planning tools which help develop an understanding of the causes, size and location of flood risk in each catchment. The Environment Agency will use this information to work out the most appropriate approach or 'policy' for managing flood risk in different parts of the catchments. This might range from working with and not against natural processes or active measures such as building new defences. CFMPs set the scene and the framework to guide future flood management activities. They do not include detailed actions or localised information on specific projects.

The Council has worked with partnership organisations to produce a Multi Agency Floor Plan outlining how the response to a flooding emergency will be managed and providing detailed information to assist in management of the emergency.

The Council has also produced public information advising businesses, Town and Parish Councils and members of the public and community on how to prepare for floods and other types of emergency, including heat waves and extreme cold weather.

7.3.2ii Humber Flood Risk Management Strategy

- Increasing potential for tidal flood impacts with rising sea levels and storm surges;

The Humber Flood Risk Management Strategy (HFRMS) is the flood risk management plan for the Humber Estuary for the next 25 years and beyond. The HFRMS looks at different ways of managing flood risk; raising defences where appropriate, but also introducing sites for managed realignment and flood storage which will also help maintain valuable habitats in the internationally important Estuary. Nearly 400,000 people live or work on low-lying land around the Humber Estuary so it is an area where rising sea levels, exacerbated by climate change, will be a major issue in the future. Approximately £300M will be invested over the next 25 years in maintaining existing flood defences, meaning that 99% of the people living on the floodplain and key industry and commerce are protected into the future.

The moving back of some existing coastal flood defences where it is deemed economically justifiable to do so will help to manage water levels by storing flood water, whilst also providing new habitat areas. This process of 'managed realignment' has already been put into place in and around the Humber Estuary at places such as Paull Holme Strays and Alkborough. In the future, the Environment Agency may use this approach in sparsely populated places in the East Riding such as Sunk Island, which will obviously have a negative impact on residents there. In other cases, villages or small

groups of houses will ultimately be protected by new 'secondary' defences (this may be an embankment behind the existing hard defence) and in some locations, residents will need to take more responsibility for managing flood risk in their area.

The Council is participating in a national emergency exercise in March 2011 to examine how the response to a tidal inundation would be managed.

7.3.2iii Shoreline Management Plan

- Increased erosion and more frequent breaching of historic defences as a result of sea level rise.

The Shoreline Management Plan review (SMP2) provides a large-scale assessment of the risks from coastal processes to people, property and the environment. From this assessment the Plan identifies the most appropriate approaches for managing the risks from coastal flooding and erosion over the next 100 years. The SMP2 covers the shoreline from Flamborough Head in the East Riding of Yorkshire to Gibraltar Point in Lincolnshire. The Plan is currently in its final stages of development, having just finished a public consultation period on the draft policies.

The draft SMP2 notes that climate change is causing sea levels to rise. In addition, it also noted that is likely that climate change will bring about increased storminess. The historic rate of sea level rise is just over 1.1 millimetres per year, based on the sea level measured at Immingham over the period between 1960 and 1995.

There is considerable uncertainty about the scale of future climate change and consequent potential sea level rise. However, the present Defra guidance on future sea level rise takes account of the latest scientific research undertaken by the Intergovernmental Panel on Climate Change and UKCP 09. These sea level rise figures have been used by all SMPs nationally in assessing future shoreline response. The relevant figures used for our stretch of coast are given in the table and suggest a total level of sea level rise of just under one metre by 2105.

Table 3: Defra sea level rise guidance (East of England and East Midlands – south of Flamborough Head)

Time period	Net sea level rise (mm per year)	Total sea level rise in each epoch (mm)	Cumulative sea level rise (mm)
Epoch 1 (2009 – 2025)	4.0	64	64
Epoch 2 (2026 – 2055)	8.5	255	319
Epoch 3a (2056 – 2085)	12.0	360	679
Epoch 3b (2086 – 2105)	15.0	300	979

These figures are taken into account in the draft policies for the SMP2 and are of real relevance when the policy recommendation for a particular policy unit is 'hold the line'. This policy will mean that the level of existing defence is maintained and improved to take account of sea level rise. The policy options of 'no active intervention' and 'managed

realignment' and the areas they are proposed for are also obviously impacted by potentially accelerating rates of sea level rise.

7.3.2iv East Riding ICZM and East Riding Coastal Change Pathfinder

The Council has secured funding as part of the Department for Environment Food and Rural Affairs (Defra) Coastal Change Pathfinder. The Pathfinder is part of the consultation on the draft Coastal Change Policy. The need to adapt is particularly pertinent to the East Riding as the Holderness coastline has a well-recorded history of rapid cliff erosion driven by coastal processes and predicted to be exacerbated by climate change in the coming years.

Pathfinders will explore ways in which the fund can be used to better engage and support communities as they attempt to adjust to the impacts of coastal change, enabling them to design and deliver local bespoke solutions. The approach in the East Riding will seek to give incentives to people living with the imminent threat of losing their home to relocate to safer and more sustainable areas. The information on coastal erosion used in identifying those at high risk in the short term has come from information produced by the Shoreline Management Plan.

The East Riding Coastal Change Pathfinder will last until March 2011, but the lessons learned from the Pathfinders and any good practice they generate will be shared and reviewed. This will allow the Council to continue to lobby for these and other approaches to be enshrined in a longer-term package of support that can be mainstreamed into national policy and guidance. This will mean that help for coastal communities to adapt to the anticipated increased rates of erosion brought on by the effects of climate change may be forthcoming on an ongoing basis past the end of the funding.

The East Riding Integrated Coastal Zone Management (ICZM) initiative will be used to facilitate the delivery of the East Riding Coastal Change Pathfinder and the East Riding ICZM Forum will provide an important tool for communicating the issues surrounding both the Coastal Change Pathfinder and initiatives relating to the new Marine and Coastal Access Act. An ICZM Adaptation Panel will be established as a sub group of the ICZM Management Group to assess applications for assistance on an individual basis.

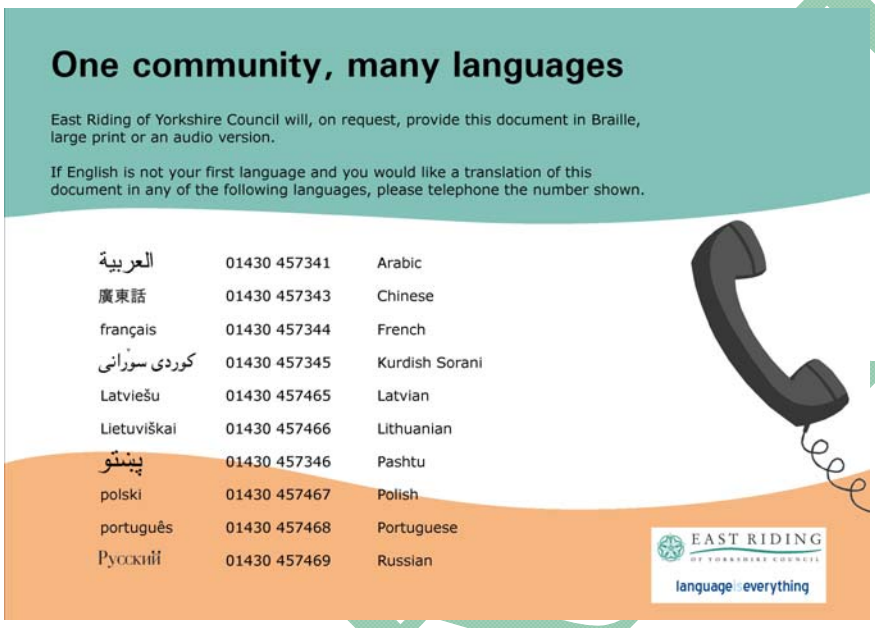
7.3.3 Economy and society

- Climate change will affect the reliability of food supply chains and water availability. This will increase costs to consumers and lead to shortages of food and water.

Work on projects such as the East Riding local food guide should continue and grow. Research on the food security of the East Riding should be undertaken. Provision of allotments should be integrated into local forward plans. A programme of water efficiency will be undertaken in partnership with Yorkshire Water ensuring the Council's own use of water is reduced and that residents are enabled to make water efficiency savings in their own homes. Much more needs to be done regarding land management, in particular the management of the county farm estate has high potential to provide local food and food security.

- A new study by the University of East Anglia estimates that fish stocks will migrate north by 40km every decade for the next 50 years. This may have a significant impact on our coastal towns and the fisheries industry.
- Climate refugees from the southern countries of the EU may bring renewed pressure on housing, services and labour markets.

Provision of services for economic migrants will be assessed in light of climate impacts. Housing services currently monitor welfare standards in rented accommodation to ensure standards are maintained and migrant workers are not exploited by landlords. Our own policies and strategies can be made available in a number of different languages. This strategy for example can be made available on request to speakers of the top ten most used languages in the East Riding. Figure 3 shows the translation services currently available from the East Riding of Yorkshire Council



- Tourism could increase and infrastructure will be required to cope with increased visitor numbers. However, the nature of coastal tourism may have to adapt to the effects of coastal change, such as coastal squeeze.

Much of the East Riding Yorkshire's tourism infrastructure is developing capacity currently. Opportunities to rejuvenate the coastal offer are being taken in the Bridlington, Hornsea and Withernsea resorts. In Bridlington, a new park and ride scheme will increase access to the town and add extra capacity for car parking out of town, reducing congestion in the town centre.

- Businesses will need to be fully equipped to respond to the challenges and opportunities of environmental change (and the requirements of environmental compliance regulations) in order to be competitive in the marketplace.

There is a high level of business support available to commerce within the East Riding. Organisations such as Business Link, Envirowise, the Carbon Trust, Business in the Community and Humber Environment Network exist to enable businesses to chart a course through environmental change, new regulation and new markets. The Council's role is to support these organisations where possible and ensure all enterprises are accessing the available advice and services.

7.3.4 Agriculture

- Risks to agriculture from changes to the growing season, droughts and floods, increased heat stress in livestock and more storm damage.
- Increased risks from pests and diseases.
- There may be opportunities to exploit growing different crops and increasing yields
- Potential increased risk of flooding of low lying agricultural land

Given the continuing importance of agriculture and agricultural land management in the East Riding of Yorkshire the Rural Policy and Partnerships team within Community and Sustainable Development is currently working with the agricultural sector to identify in greater detail the impacts, challenges and opportunities presented by a changing climate. Opportunities such as the growing of energy crops, anaerobic digestion and community supported agriculture are being investigated. The competition between food and biomass production will also be taken into account.

East Riding of Yorkshire Council works in partnership with external partners from the private, public and voluntary sectors across the East Riding of Yorkshire and the wider (City-) region through The East Riding of Yorkshire Rural Partnership (ERoYRP).

In June 2009 we launched a Rural Strategy for the Hull and Humber Ports City Region, which geographically covers the East Riding of Yorkshire and neighbouring sub-regional authority areas. The Strategy includes a section communicating key vulnerabilities and risks arising from climate change, and contains a number of action points to both mitigate and adapt to the challenges faced.

ERYC has identified an officer to lead on rural climate change issues within the service. Articles on climate change, carbon reduction and renewable energy have all been included in the ERoYRP's quarterly newsletters which are distributed to external partners and accessible on the internet. This coupled with partnership meetings helps to raise awareness of climate change and communicate key risks and impacts.

Agriculture is at the forefront of the challenges of both climate change and food security. Changes to the growing season, more extreme weather events and the threat of new pests/diseases are all risks to the sector. However, climate change also presents opportunities such as growing different crop varieties, potential for enhanced yields and renewable energy production. The changing climate is already affecting farmers and it is vitally important that the sector is sufficiently 'future-proofed' to respond and adapt to the challenges ahead.

In the winter of 2010, the Council, with its partners, delivered a workshop targeted at rural businesses covering climate change, population and food production. The conference was very successful, including high profile expert speakers and workshops tailored specifically to adaptation in rural business. Events such as these are crucial to moving adaptation projects forward and will be replicated in the future.

Findings from the Regional Climate Change Adaptation study, together with existing climate change research information (such as that produced by the Farming Futures organisation) will help shape the content of the training programmes.

It is hoped to deliver ongoing training workshops in with the overall objectives of helping rural businesses in the county;

- understand the likely impacts of climate change;
- develop the knowledge and skills to change current practices where appropriate (eg. use of better rainwater harvesting/on-farm reservoirs, grow new crop types or varieties)
- develop the knowledge and skills to spread the risk/uncertainty of climate change by diversifying their businesses (for example renewable energy production) and benefiting from new business opportunities.

The proposed training programme is also intended to help agricultural businesses reduce their carbon footprint and respond to recent Government policy initiatives such as the UK Low Carbon Transition Plan (eg. better carbon accounting; efficient use of fertilisers, manure/slurry).

East Riding of Yorkshire Council extensively supports the promotion and development of the local food sector. Global climate change projections, together with population growth forecasts, indicate that food security will increasingly become an issue which affects the UK in the longer term. By continuing to support capacity building for the local food sector in the East Riding of Yorkshire, and promoting locally grown produce in general, we aim to ensure that a strong local food supply chain will be well placed to meet the challenges of future demand. This will provide opportunities for new and existing small businesses in the East Riding to establish and grow.

7.3.5 The natural environment

Yorkshire is very much on the bio-geographical cusp between the warmer and drier lowlands of Eastern England and the cooler and wetter north and west. Key issues relating to climate change and biodiversity in the East Riding are summarised as follows:

- Rising sea levels resulting in loss of valuable habitats and changes in habitat type;
- Rapidly eroding coastline resulting in loss of valuable habitats;
- Low lying areas susceptible to flooding; and
- Locally fragmented semi-natural habitats making them susceptible to further isolation and species extinctions.

The East Riding of Yorkshire Biodiversity Action Plan (ERYBAP) aims to sustain, restore and create a thriving, vibrant and sustainable network in which the priority species and habitats of the East Riding can prosper. An essential part of the ERYBAP is to promote the development of strong networks of habitats for the East Riding that will provide space for biodiversity and the ability for biodiversity interests to move and change as part of the challenges posed by climate change and other pressures.

Local Wildlife Sites (LWS) are locally designated sites of valuable natural or semi-natural habitats, and many provide a refuge for rare or threatened species. The East Riding of Yorkshire LWS Panel aims to review the existing register of LWS against criteria for selection using data collated through the ongoing ERY LWS Survey. The government's expectation regarding the role of local authorities at Local Sites is set out within National Indicator 197 and is defined as the proportion of Local Sites where positive conservation management has been, or is being implemented.

The Country Mile Project aims to foster a greater appreciation of and regard for the wildlife value of Verge Nature Reserves (VNR) and other linear habitats and help support the development of an ecological network by bringing the VNRs into active management. The Yorkshire Wolds holds the most northerly outcrop of chalk in the UK and therefore many species with affinities to chalk habitats, including chalk grassland, are at the northern edge of their range. Climate change means that the conditions that many species require will move northwards and the species will need to move with them in order to survive. Connecting habitats like verges will be crucial in allowing this movement to occur between larger areas of habitats.

Another potentially important policy area for the LDF, in terms of adapting to the likely impacts of climate change, is 'green infrastructure'. For instance, a policy aimed at conserving and enhancing the area's green infrastructure, such as aiming to increase tree cover, and link other types of green assets in new developments and elsewhere, could not only help with urban cooling, but help to create and enhance habitat networks, better enabling the area's biodiversity to adapt to climate change

7.3.5 Transport infrastructure

- Road surfaces may need to be more heat resilient to cope with higher projected summer temperatures.
- Alternative routes may need to be found or existing routes protected for road and rail infrastructure; and sea defences may need to be provided to prevent strategic routes from being damaged by coastal erosion.
- Climate change is likely to affect UK ports in particular, with extreme weather or rising sea levels resulting in flooding and possibly disrupting operations. In addition, ports on the east coast may face an increased risk from storm surges. To reduce these risks port operators may need to, for example, change the height and configuration of harbour walls and their drainage.
- Capacity of drainage may need to be increased to safeguard transport routes.
- More frequent repairs to road and rail corridors in response to wider temperature ranges and damage from weathering.

Local Transport Plan 3 is currently under development and will address possible adaptations to climate change. Many of the impacts above are however mild in comparison to impacts in other areas. Road surfaces in the East Riding, as in most parts of the UK, are vulnerable to both extreme heat and extreme cold. Repeated freeze thaw cycles as seen in the winter of 2010 can cause potholing of roads whilst extreme heat can cause roads to 'melt' which can also create dangerous conditions. In order to plan for these occurrences in the future, the way we deliver highway maintenance will change along with industry standards. Monitoring weather trends and the condition of highways in the East Riding will ensure roads stay safe and useable.

7.3.6 People

All the impacts above and below have an effect on people but specific impacts will be:

- Urban heat islands will develop in towns. This was serious enough in the 2003 to contribute to 2000 premature deaths in the UK and 14000 in France. The predictions suggest this will become far more common, and will need to be addressed in spatial plans, amongst other strategies including public health.

- People will be more attracted to live and work in a well adapted community. Communities that are designed to deal well with heat waves and water stress are likely to prosper.

In this area, work with public health partners and developers will be important to adequately manage risks. Working with organisations from the Local Strategic Partnership, the Council will integrate planning for water shortage and heat stress. Working with organisations from the Local Resilience Forum, the Council will ensure emergency planning arrangements are reflective of the challenges caused by climate change.

7.3.7 Buildings

Offices are more likely to overheat as a result of warmer summer temperatures. Methods of passive cooling such as the use of blinds and external shading will be needed so as not to increase the reliance on air conditioning, which will increase energy consumption.

- Premises may be exposed to increased risk of flooding due to higher winter rainfall levels and an increased frequency of extreme weather.
- There will be increased risk of subsidence – the summer of 2003 saw claims of £400 million for subsidence.

The LDF could also set policies to ensure that buildings are better able to cope with warmer temperatures and droughts, for example by requiring developers to adopt lay outs that make the best use of passive solar heating and cooling, meet high standards of water efficiency, and incorporate other measures advocated by the Code for Sustainable Homes and BREEAM sustainable construction standards.

The Development Management service will also work proactively with developers of both domestic and non domestic buildings on the implementation of environmental and energy targets in emergent building regulations.

7.4 Action Plan

7.4.1 This Adaptation strategy will be delivered by the 'Climate Change Adaptation Action Plan in Appendix 2. Actions will be put in place to ensure our services and those of our local businesses and partners are able to flourish in a changing climate. As with the Mitigation action plan in Appendix 1 the actions will be subject to annual internal review.

8.0 Part 3 Awareness Raising

8.1 East Riding Council is committed to taking a lead in tackling climate change. An important part of leadership is communication. By undertaking a programme of education and awareness we hope to achieve the first element of our vision for 2012:

Climate change risks and opportunities are understood by all. Climate change is an issue we can all engage with. Residents, Business and the Council are all aware of climate change risks, what is being done and more importantly how each can play their part.

8.2 In order to reach this point the Council needs to ensure that our messages regarding climate change are clear. We also have a wider role however in raising awareness of the issue. Though there are frequent stories in the media regarding climate change there are few consistent messages. East Riding of Yorkshire Council's aim is to open up debate on the best ways of solving the issue whilst encouraging residents and partners to take action now. In the awareness raising action plan below (Appendix 3) the work we intend to do with residents and partners is outlined. As with the mitigation and adaptation action plans, the awareness raising action plan

9.0 Conclusion

9.1 This strategy has set an emissions reduction target of 34% for emissions from our own operations. We also have set a target of 34% reduction on 2007 levels for the county as a whole (excluding industrial and commercial emissions). This will include actions across our property, transport and service portfolio. The target will affect the way the council works with regard to travel and behaviour. The strategy has also a target of 34% reduction on 2007 levels for the county as a whole (excluding industrial and commercial emissions). We have outlined the actions East Riding of Yorkshire Council intends to take on adapting the area to the future impacts of climate change. We have committed to awareness raising and building a shared community vision on where we intend to be in 2020 and 2050 as residents, businesses and the local authority working together.

9.2 This strategy is important to the Council, its residents and partners as it sets out how we intend to tackle one of the most pressing and complex issues of our time. The task of tackling climate change is an ever evolving one. This strategy will be subject to regular review and updated accordingly. Whilst maintaining the core themes of emission reductions, adaptation and awareness this strategy will respond to the latest policy and science to ensure climate change is tackled in an effective and timely way.

.

Appendix 1

Mitigation Action Plan

Note: Ongoing actions will be reported against annually in the Action Plan Review

Area of intervention	Actions	Proportion of footprint	Who	When	Resources: Existing and required (Including Human, Technical, Financial and Knowledge based)
Internal emissions reductions (Within East Riding of Yorkshire Council)					
Schools	1. Implement schools energy efficiency projects in the 10 highest use schools. 2. Ensure monitoring of Building schools for the future CO2 reductions 3. Promote eco-schools/green flag to head teachers and governors 4. Incentives for schools to reduce energy use	36.49%	Community and Sustainable Development, Asset Strategy, School Improvement Services	1. Ongoing 2. March 2012 3. March 2012 4. Ongoing to 2020	1-4 there are existing resources to monitor energy use but no coordinated improvement programme. External funding will be sought to facilitate these actions.
Street lighting	5. Undertake cost benefit analysis of implementing low energy/LED luminaries 6. Undertake cost benefit analysis of intelligent demand management of street lighting	14.6%	Technical Services, Community and Sustainable Development, Asset Strategy	5. May 2012 6. May 2011	5. Human resources in Place 6. Human resources in place
Council buildings	7. Increase Display Energy Certificate ratings in all relevant council buildings 8. Continue to invest in energy efficiency measures in high energy use buildings 9. Undertake 5 annual awareness raising campaigns with staff on energy efficiency 10. Investigate rewards for energy efficiency with facilities managers.	82.85%	Asset Strategy, Infrastructure and facilities, building users, Community and Sustainable Development.	7. Ongoing to 2020 8. Ongoing to 2020 9. May March 2010 10. September 2010	7. Financial, Technical and Human resources in place 8. Financial and Human resources in place 9. Human Resources in place 10. No existing resources in place
Business mileage	11. Increase the use of video conferencing across the council by 25% 12. Invest in at least two pool cars for county hall staff 13. Prioritise rail travel over private cars.	7.19%	Human Resources, Arvarto, Community and Sustainable Development	11. May2012 12. March 2011 13. Ongoing	11. Human and Technical resources in place 12. Human resources in place

					13. Human resources in place
Fleet Transport	14. Ensure carbon emissions are a material consideration when buying all new fleet vehicles 15. Ensure each driver has undergone eco-driver training to get the most out of the fuel we use.	9.88%	Transport services, Procurement, Community and Sustainable Development	14. Complete 15. September 2010	14. Human resources in place 15. Financial resources in place under current driver training initiatives
External Emissions Reductions (those emissions from the county as a whole)					
Homes and communities	16. Prioritise climate change within the local strategic partnership (tackling climate change is high priority in new Sustainable Community Plan.) 17. Partner with the energy saving trust to deliver a wide range of measures relating to home energy efficiency including smart energy monitors and energy efficiency advice to residents. 18. Ensure residences owned by the council have high SAP ratings 19. Deliver all new council dwellings to Code For Sustainable Homes level 4 and above 20. Continue to deliver affordable warmth and energy efficiency installations to vulnerable groups	28.79%	LSP Board Community and Sustainable Development, Housing and Public Protection, The Energy Saving Trust, Asset Strategy.	16. March 2011 17. Ongoing 18. SAP 79.50 Average by Mar 2011 19. In Place 20. Ongoing	16. Human resources in place. 17. Human Resources in place 18. Human, Financial, Technical and Knowledge resources in place 19. Human and Financial resources in place. Knowledge resources gap (External funding identified) 20. Human, Financial, knowledge and technical resources in place.
Local Development and Land Use	21. Ensure new developments meet high environmental standards 22. Concentrate development around existing services and jobs to reduce emissions from travel. 23. Ensure renewable energy is encouraged in appropriate locations.	100%	Asset Strategy, Development Management, Economic Development.	21. Ongoing 22. Ongoing 23. Ongoing	21. Human and Financial resources in place. Knowledge resources gap (External funding identified) 22. Human resources in place 23. Human and knowledge resources in place

Transport	24. Deliver a suite of mitigation measures through Local Transport Plan 3 including increases in use of public transport and movement to cycling and walking shorter journeys. 25. Research options for car clubs 26. Research feasibility of electric vehicles and alternative fuels in the East Riding. 27. Develop Park and Ride schemes for Bridlington and Beverley linked to new road infrastructure.	23.07%	Asset Strategy (Transport team), Community and Sustainable Development. Transport Services, Highways services.	24. 2010-2025 25. March 2011 26. June 2011 27.Bridlington Operational by end of 2010. Beverley, 2013	24. Human, Technical, and Knowledge resources in place 25. Human resources in place 26. Human resources in place, knowledge resources gap 27 Human, Technical and Financial resources in place
Business and Partner Engagement	28. Ensure the climate change agenda is being implemented by our suppliers via sustainable procurement by risk managing new contracts. 29. Support the work of local, regional and national business support organisations such as the Carbon Trust and Humber Environment Network 30. Extend the benefits of environmental management to partners 31. Continue to work with Humber authorities on coordinating climate change work across the region.	48.10%	Procurement, Community and Sustainable Development, Economic Development	28. March 2011 29. Ongoing 30. Ongoing 31. Ongoing	28. Humana and Knowledge resources in place 29. Human resources in place 30. Human and knowledge resources in place 31. Human resources in place in ERYC and with Humber partners.
Waste	32. Exceed 45% recycling and composting of Municipal Waste 33. Deliver energy from waste solution for residual waste 34. Drive waste minimisation across residents and business. Update waste minimisation actions annually.	Unknown (Work underway to baseline)	Streetscene Services, Community And Sustainable Development	32. December 2010 33. Work underway 34. Annual waste minimisation actions.	32. Human, technical financial and knowledge resources in place. 33. Human, Technical, knowledge resources in place. Financial resource allocation underway. 34. Human resources in place
Energy	35. Develop models and opportunities for community owned renewable energy 36. Continue to manage energy developments in the East Riding to support job creation, energy security and a low carbon economy. 37. Support the biomass partnership and deliver biomass installations in appropriate council properties.	71.17%	Community and Sustainable Development, Asset Strategy, Economic Development	35. Online resource by may 2011 36. Ongoing 37. One pilot installation by March 2011.	35. Technical and knowledge resources need to develop in this area. 36. Human, Technical, resources in place. 37. Human and Financial resources in place. The first project will be a pilot to increase

					technical and knowledge resources.

Appendix 2

Adaptation Action Plan

Note: Ongoing actions will be reported against annually in the Action Plan Review

Area of Intervention	Actions	Who: Services and Partners	When	Resources: Existing and required (Including Human, Technical, Financial and Knowledge based)
Flooding	1. Complete or continue to implement the 36 recommendations of the Flood Review Panel relating to ERYC and support partners in implementing their recommendations. 2. Continue to develop the multi agency operational liaison group 3. Implement LDF policies where possible to reduce flood risks posed to people and buildings. 4. Continue to deliver specific measures in the Humber Flood Risk Management Strategy. 5. Publish a robust Shoreline Management Plan covering the coastline from Flamborough head to Gibraltar Point. 6. Reduce risks to residents by implementing coastal pathfinder and ICZM 7. Continue to develop East Riding of Yorkshire Multi Agency Floor Plan. 8. Participate in National Flooding Exercise Watermark (March 2011).	Asset Strategy, Drainage Boards, Yorkshire Water, Environment Agency, Natural England, Parish and Town Councils, Infrastructure and Facilities, Community and Sustainable Development.	1-4 Requires input from Asset Strategy 5. End 2010 6. Awaiting Information	1-4 Requires input from asset strategy 5. Human, Knowledge, Technical and Financial Resources in place
Economy and society	9. Continuation and expansion of the local food guide. 10. Investigate expanded provision of allotments integrated into local food plans. 11. A programme of water efficiency to be in partnership with Yorkshire Water delivering savings to the council and residents. 12. Continue to promote citizen, community and emergency preparedness.		7. Annual, ongoing. 8. November 2010 9. November 2010	7. Human Resources in place 8. Technical and Financial resources currently not in place. 9. Human, Technical, Knowledge and Financial Resources in place

Agriculture	13. Workshops targeting rural businesses covering climate change/population & food production. 14. A proposed training programme intended to help agricultural businesses reduce their carbon footprint/respond to recent government policy initiatives. 15. Management of country farm estates to provide local food and biodiversity benefits. 805 on accredited biodiversity scheme by 2012	Community and Sustainable Development, Economic Development, The Rural Partnership, Asset Strategy.	10. Ongoing 11. Delivered throughout 2011 12. December 2012	10&11. Human and Knowledge resources in place 12. Technical and Knowledge resources in place, lack Human resources
The natural environment	16. Adopt the East Riding of Yorkshire Biodiversity Action Plan (ERYBAP) – promoting the development of a strong network of habitats. . Providing space for Biodiversity. 17. East Riding of Yorkshire LWS Panel to review the existing register of LWS against criteria for selection using data collated through the ongoing ERY LWS survey. 18. Continue the implementation of the 'country mile' project 19. Develop LDF policies to deliver 'green infrastructure', to increase tree cover, linking other types of green assets as part of new developments and elsewhere.	Community and Sustainable Development, Sustainable Natural Environment Task Group, Natural England.	13. December 2010 14. March 2013 15. Annual reviews subject to funding. 16. Ongoing	13. Human, Technical and Knowledge resources in place 14. Human, Technical and Knowledge resources in place. Financial resources partially in place. 15. Human resources in place 16. Human, Technical and Knowledge resources in place
Transport infrastructure	20. Monitor changes to the delivery of highway maintenance and industry standards. 21. Monitor weather trends and the condition of highways.	Infrastructure and Facilities, Community and Sustainable Development	17.Annual Review May each year. 18. Ongoing	17&18. Human and knowledge resources in place.
People	22. Working together with public health partners/developers and organisations from the local strategic partnership East Riding of Yorkshire Council to integrate planning for water shortages and heat stress.	NHS, PCT, Community and Sustainable Development	19. Ongoing...	19. Need for resources to be mapped in 2010 in partnership with PCT
Buildings	23. Incorporate other measures advocated by the Code for Sustainable Homes and BREEAM Sustainable Construction Standards.	Infrastructure and Facilities, Asset Strategy, Community and Sustainable Development, Development Management	20. On adoption into law of CSH Standards, Awaiting the outcome of regional study.	20. Human resources in place, technical and knowledgs resources required.

Appendix 3

Awareness Raising Action Plan

Note: Ongoing actions will be reported against annually in the Action Plan Review

Area of Intervention	Actions	Who: Service and Partners	When	Resources: Existing and required (Including Human, Technical, Financial and Knowledge based)
Residents and Partners	1. Building the climate change vision (engaging residents on building the 2020 and 2050 vision at the top of this document 2. Show a series of films and host a series of workshops on climate change, energy and the environment throughout 2010/11 3. Host a virtual debate on climate change and the environment 4. Continue training provision for partners on preparing for climate change. 5. Continue to promote citizen and community resilience to an emergency through the Council's 'Preparing for Emergencies' campaign. 6. Contribute climate change information to the Humber Local Resilience Forum Community Risk Register Process to inform future resilience planning initiatives.	Community and Sustainable Development, Sustainable Communities and Transport Action Group, Parish and Town Councils, Energy Saving Trust, City of Hull and Humber Environment Forum.	1. January – November 2011 2. throughout 2010-11 3. Forum live by February 2010 Ongoing	1-4 Human, technical and knowledge resources in place. Some financial resources required.