

WORCESTERSHIRE PARTNERSHIP CLIMATE CHANGE STRATEGY 2005 - 2011

2009 REVIEW



REVIEW OF WORCESTERSHIRE CLIMATE CHANGE STRATEGY 2008

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Foreword

The UK is experiencing its most serious economic downturn since the Great Depression. Unemployment is rising, companies are closing and for most people their everyday experience is one of living in troubled and uncertain times. The economic downturn is one component of this period of uncertainty, but climate change is another. This economic downturn will pass, but climate change is not going to disappear. There can be no question that the climate is changing and these changes are impacting on the lives of everyone living and working in Worcestershire. This Strategy has been developed by and for the people of Worcestershire in order for them to help tackle, manage and adapt to climate change.

Climate change is a double-edged sword; it is an extremely serious threat but also an opportunity. One impact is the increasing incidence of extreme weather events. Over the last couple of years Worcestershire has experienced a number of major storms with subsequent flooding. Many homes and business have been flooded and the consequences for individual families and businesses have been extreme; residents of buildings that have never flooded before have been forced out of their homes and business premises. Climate change is not just about flooding, but is also about drought & increasing temperatures. Alterations in the climate impact in many ways; on the crops that can be grown in the County, on wildlife and landscapes, on buildings and infrastructure. Eventually it will transform the appearance of the Worcestershire landscape and our towns. Our buildings will have to change to meet the requirements of our new climate and our behaviours will also change as we develop new lifestyles.

There is a danger that we become too fixated on the negatives associated with climate change and this can lead to a feeling it is too big an issue to tackle. We need to recognise that we all can do something to help tackle climate change and that doing so presents important new opportunities. For example companies throughout Worcestershire have the opportunity to develop new products and services designed to manage and mitigate against the impacts of climate change. Tackling climate change is partly about saving money by reducing resource consumption, particularly consumption of fossil fuels for energy; money that individuals can spend on improving the quality of their lives or firms could spend on innovation.

There is no question that the behaviour of everyone living in Worcestershire must change and these changes must lead to dramatic reductions in emissions of CO₂ and other gases and also lead to reductions in the amount of waste produced. Reducing emissions can be achieved by effective insulation and building management to reduce energy required to heat and power buildings combined with an increase in the use of renewable energy and a decrease in our use of fossil fuels for transport.

In 2005 the Worcestershire Partnership published one of the very first climate change strategies to be produced by a Local Strategic Partnership. The 2005 strategy was path breaking and demonstrated the Partnership's foresight in placing climate change on the policy agenda. This is the first review of the strategy. Over the last three years the County has begun to develop the policy tools and strategies that are essential to tackle climate change. Much has been achieved, but there is still much more to do.

The development of the 2005 strategy heralded the start of a journey towards tackling the causes of climate change and this is going to be a long journey. The Partnership is leading by example and there have been some notable achievements. Amongst these has been the formation of the Climate Change Task Group; the group that works with all members of the Partnership to develop, implement and monitor the Worcestershire Climate Change Strategy. This includes working to try to ensure that all Partnership strategies and practices address climate change. A good example is the Worcestershire Community Strategy where climate change is identified as a cross-cutting issue that is addressed throughout the strategy. The Community Strategy represents best practice in the development of a policy document that is climate change friendly. There is a real danger that climate change is 'bolted on' to existing strategies rather than being considered as an integral driver towards policy formulation and implementation. Another major achievement was Worcestershire County Council's award of Beacon Status in 2008 for tackling climate change. This is an extremely important award that draws attention nationally to the best practice that has been developed and implemented across the County.

The Worcestershire Partnership Climate Change strategy is formulated around three pillars: raising awareness, reducing emissions and adapting to impacts. These pillars have been incorporated into the Local Area Agreement and the County's performance will be measured and assessed. By taking immediate action we can enjoy warmer homes, reduced fuel bills, tackle fuel poverty and create a climate friendly and productive local economy.

EXECUTIVE SUMMARY

1. Rising concentrations of greenhouse gases from the burning of fossil fuels - in homes, in power stations and through transport, business & industry use - are contributing to warming of the atmosphere, resulting in a noticeable effect on weather patterns around the World.
2. Globally, temperatures are rising, and severe weather events such as storms, flooding, gales, heat waves and droughts are becoming increasingly common. The human costs include food shortages, health risks and economic damage. Predictions show current trends continuing into the next century.
3. Worcestershire's climate is changing. We now have shorter milder winters, but increasingly extreme weather. In the next decade and beyond it is predicted there will be further climate change and the incidence of extreme weather will increase. Such changes will impact on Worcestershire's environment, economy and society. Worcestershire residents believe that many of the impacts of climate change are already being felt in the County and where this is not already the case that they will do so in the future.
4. Climate Change is an issue that will not go away – the need to raise awareness of what it means for each and every one of us, change behaviour and take actions that reduce the emission of the greenhouse gases (particularly CO₂) that cause it, and to plan for and adapt to its effects grows more urgent day by day.
5. Nationally the Climate Change Act 2008 proposes to introduce legally enforceable national targets to reduce UK carbon dioxide emissions by at least 34 per cent by 2022 and at least 80 per cent by 2050, compared to 1990 levels.
6. The Worcestershire Partnership has included Climate Change as a cross cutting theme in the Worcestershire Sustainable Community Strategy (SCS). This means that the issue of climate change is one that must underpin all areas of the Partnerships activities, including all our strategies and policies.
7. The Partnership has also agreed a number of targets that contribute to tackling climate change as part of its Local Area Agreement (LAA). The following **LAA targets** relate directly to this Climate Change Strategy
 - **NI 186 – Reduction in per capita CO₂ emissions in the LA area**
 - **NI 188 – Adapting to climate change**
 - NI 175 – Increasing access to services and facilities by public transport, walking and cycling
 - NI 187 – Tackling Fuel Poverty
 - NI 193 – Reducing the amount of municipal (i.e. domestic) waste sent to landfill
 - Local Target – Reducing the risk of flooding
8. This review of the Worcestershire Climate Change Strategy is a renewal of the Partnership's commitment to tackle the challenges of climate change. We must work together to:
 - Raise Awareness of the Issue of Climate Change
 - Reduce Worcestershire's Climate Change Emissions
 - Plan and Adapt to the Impacts of Climate Change

Raise Awareness of the Issue of Climate Change

9. This section outlines the steps that we have already taken and what we still need to do to raise the awareness of the public, community organisations, businesses, schools and other formal and informal educational settings of the issue of climate change. Whilst there is evidence that awareness has increased there is little evidence that this has resulted in a reduction in CO₂ emissions, and this is the case for the UK as a whole.

[1] Membership of the Task Group can be found at Appendix Two

10. The challenge is to translate the growing awareness of Climate Change into significant actions by individuals and organisations that will contribute to the reduction of greenhouse gases in Worcestershire.
11. We intend to continue to promote the messages about climate change, highlighting what we can all do to make a positive difference. The need to raise the profile of this issue and create a sense of urgency about the action that is required remains high. Actions about awareness raising are included in and are critical to the success of every section of this Strategy.

Reduce Worcestershire's Climate Change Emissions

12. Worcestershire's homes, businesses, public organisations and transport (excluding motorways), generated an estimated 3.9 million tonnes of CO₂ in 2005; approximately 7.1 tonnes per person.
13. Through the Local Area Agreement the Worcestershire Partnership has agreed a target to reduce CO₂ emissions in Worcestershire (NI 186 'total CO₂ emissions per head of population'). The target is a 9percent reduction in CO₂ emissions from 2005 levels by 2011. The Government has agreed to play its part in this reduction contributing 7.1percent from national measures (such as legislation, carbon trading, strengthening building regulations, national energy and planning policy etc.). This means the Worcestershire Partnership is responsible to the UK government for achieving a 1.9percent reduction in CO₂ locally from 2005 levels by 2011 (approx 75,000 tonnes reduction).
14. Meeting this target will be a challenge – the rural nature of parts of Worcestershire creates demand for transport, often the private car. A large proportion of the county's housing stock is old, and can be harder to adapt to energy saving measures. Nevertheless all of us CAN contribute, making choices and changes to our lifestyles that will contribute to reducing CO₂ emissions. E.g. improving the energy efficiency of our own homes
15. The greatest reductions will be achieved by reducing energy use and improving energy efficiency. The domestic sector (homes) offers good potential for CO₂ reduction, but action is also needed to reduce energy use across the public, voluntary, and the commercial and industrial sectors.
16. Plans for the future development of the County mean that substantial new housing development and associated infrastructure will be required in the years ahead. We will need to be pro-active in promoting sustainable development, ensuring that full account is taken of climate change and its impacts, if we are to reduce Worcestershire's contribution to global warming and improve the County's future resilience.
17. Critical to this will be reducing the reliance on the private car through improving passenger transport infrastructure and services and promoting walking and cycling. Other policies such as encouraging locally produced goods and services and planning policies that reduce the need for travel will also play a part.
18. As our learning increases we are becoming more aware of how land use can either contribute to or mitigate against CO₂ emissions. We want to promote land uses that captures greenhouse gases, rather than release carbon into the atmosphere
19. Minimising household waste and that produced by the industrial and commercial sectors, reducing the amount of waste that is sent to landfill sites, and exploring the potential for using waste products as a useful resource will also contribute to the target through reducing the methane and carbon dioxide greenhouse gases released from waste decomposition in the ground
20. An independent study has been commissioned to provide an objective assessment of the realistic capacity of the County to generate renewable energy at the larger scale. We will continue to support the development of renewable technologies and the use of renewable energy sources where possible and appropriate throughout the County.
21. This wide range of activity will need to be rigorously pursued in an integrated way if Worcestershire's contribution to global warming is to be reduced.

Plan for and Adapt to the Impacts of Climate Change

22. We recognise that some of the impacts of climate change are now inevitable. The task is to plan for and adapt to the changes that will occur. The section provides information about predicted impacts on Worcestershire.
23. Worcestershire Partnership have recognised the urgency of the task and have signed up to a further target in the Local Area Agreement that commits local authorities to taking accelerated action to plan for the impacts of climate change on the County.
24. They cannot do this in isolation. The section describes what others will need to do. It covers activities that will be required by all public sector organisations and industry and commerce in order to adapt to climate change.
25. There are positive benefits to the county in taking adaptive actions now. The costs of extreme weather events are high. Worcestershire's homes and businesses need to be prepared, assessing risk and taking action to minimize impacts. Whilst new developments can be planned in a way that takes full account of reducing emissions and can include adaptive measures, protecting the existing building stock (especially historic buildings), is a real challenge.
26. The natural environment is also vulnerable to the impacts of climate change, we want to understand more about what realistic measures can be taken to protect and increase resilience to change for the natural environment, and ensure that this issue is given proper profile and consideration in future planning.

Delivering this Strategy

27. A detailed Action Plan that sets out further detail of activity, measures and targets will support all areas of this Strategy. The Worcestershire Climate Change Task Group will report to the Worcestershire Partnership Board to ensure that the Strategy is delivered.

1. INTRODUCTION – THE REVIEW OF THE WORCESTERSHIRE CLIMATE CHANGE STRATEGY

"Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global sea level" Intergovernmental Panel on Climate Change (IPCC) 2007

1.1 What Is The Worcestershire Climate Change Strategy And Why Has It Been Reviewed?

The Worcestershire Partnership¹ is the Local Strategic Partnership for the County. In 2005 we published the first "Worcestershire Climate Change Strategy". The Strategy² was produced in response to the Governments call for organisations and authorities across the country to take action to ensure that we are prepared to deal with the impact of Climate Change and to urgently take action to slow its progress.

The Strategy set out a framework for action by members of the Worcestershire Partnership to: -

1. **Raise awareness of the issue of Climate Change & its impact on the County**
2. **Reduce Climate Change causing gas emissions across the County**
3. **Plan for and adapt to the inevitable impacts of Climate Change on the County**

The Strategy covered the period 2005 – 2011, but we promised to review it every 3 years to:

- Check on our progress
- Refine and update our objectives in the light of new information and
- Set out further actions and activity for the next 3 years

This document is the result of that review.

In compiling it we have called on a range of opinion, expertise and evidence. We have: -

- Held a full day **Climate Change Conference** in June 2008 attended by more than 70 stakeholders to examine the evidence and establish priorities for action
- Used the Worcestershire County Council **Citizens Panel** to canvas residents opinion and priorities in respect of climate change
- Used the evidence gathered as part of the Worcestershire County Council **Climate Change Scrutiny**³ process to find out more about local opinion and incorporated where appropriate the findings of the Scrutiny report into this Strategy
- Widely circulated a "**draft**" version of this Strategy to organisations and stakeholders inviting contributions, comments and further actions that could be included in the detailed Action Plans that will accompany this Strategy. The comments made on the Draft Strategy and the Partnerships response can be viewed **here**. A number of changes have been made to the document and additions made to the Action Plan as a result of the consultation
- Hosted an **on-line Climate Change Forum** on the Worcestershire Partnership website as part of the consultation process on the draft Strategy
- Invited a wide range of **experts and partners** to contribute to this document through the **Worcestershire Partnership Climate Change Task Group**⁴

This process has resulted in an updated Strategy that strengthens the Worcestershire Partnerships commitment to tackle the challenges of climate change.

¹ For a list of Worcestershire Partnership Board members see Appendix One

² When we use the term Strategy in this document we are referring to this Worcestershire Climate Change Strategy unless otherwise specified

³ Councillors will take an in depth look at how Worcestershire County Council is responding to the issue of climate change (scrutiny). This will involve gathering views from the public and young people. They will make recommendations about how things can be improved to the Councils cabinet, who take the decisions about how the County Council is run

⁴ For a list of Worcestershire Partnership Climate Change Group Members see Appendix Three

2. CLIMATE CHANGE: THE NEED FOR ACTION

2.1 Climate Change: What's Causing It?

Our atmosphere is a valuable resource- yet we largely take it for granted. It is estimated that the services provided to us by the atmosphere can be valued at £5,000 trillion or ten times the global world product. It provides the air we breathe, transmits sound, protects us from ultra violet radiation and keeps us warm. The atmosphere "warms" the surface temperature of the earth - but this warming is being "enhanced" or increased through human activity. The rate of change is unprecedented – and coincides with a significant increase in CO₂ emissions.

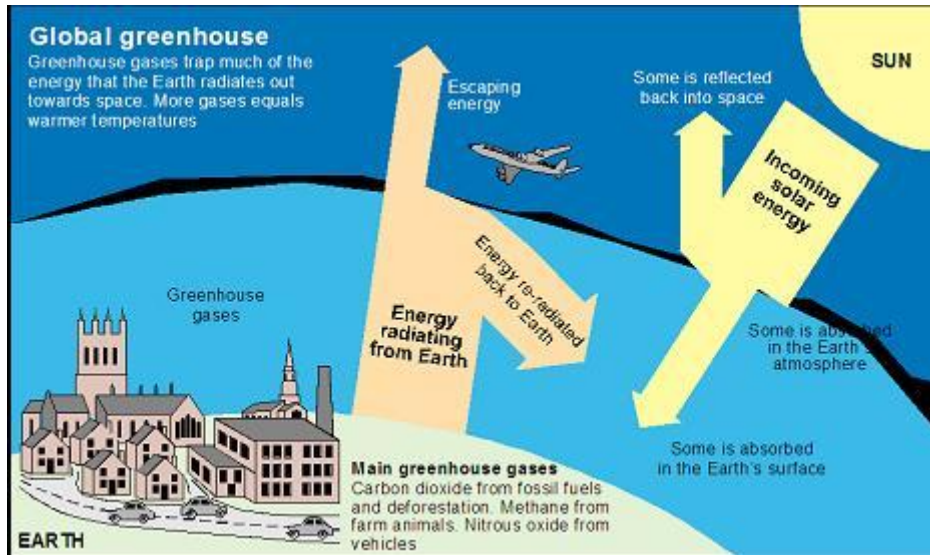


Figure One – Diagram explaining global warming

The burning of fossil fuels like oil, coal and gas; alongside certain agricultural and industrial activities and the decomposition of rubbish releases gases like Carbon Dioxide⁵ (CO₂), Methane (CH₄), Nitrous Oxide (NO_x) and Hydrofluorocarbons (HFCs) into the atmosphere. To a certain extent many of these gases are present naturally and work like a "greenhouse" trapping heat in the atmosphere and keeping the earth at a liveable temperature. The problem is that since the industrial revolution we've been releasing more of these gases than would occur naturally. When we burn fossil fuels we release the carbon dioxide that has been stored in them for millions of years. Massive burning of fossil fuels in just a few decades has emitted huge amounts of CO₂. As a result **the 'greenhouse effect' has accelerated and comparatively rapid warming of the earth is occurring.**

2.3 Climate Change: What Will It Mean For The World?

We can already see evidence of the impact of climate⁶ change. Globally temperatures have remained exceptionally high in relation to the last 150 years. In fact looking at average (mean) temperature from land and ocean regions since the beginning of instrumental measurements (1856-2007) **12 of the 13 warmest years have occurred in the last 13 years (1995-2007)**⁷. The science behind greenhouse gases and global warming remains very strong and temperature rise in the medium term is inevitable. Consequently worldwide glaciers are retreating and sea levels are rising. Severe weather events such as storms, flooding, gales, heat waves and droughts are becoming increasingly common.

⁵ Carbon Dioxide (CO₂) is one atom of Carbon 'C' joined with 2 atoms of Oxygen 'O'. It is a gas produced from human activities, in the main the burning of carbon-based fuels, e.g. oil, for energy but also from other processes using carbon based materials, such as cement production. It is produced naturally mainly from the decay of plants, volcanic eruptions and as a waste product of animal and plant respiration. We refer to CO₂ emissions rather than carbon emissions in this Strategy

⁶ 'Climate' is a term used to describe the average weather and its variability over a long period of time, usually 30 years (we talk about climate change in terms of decades or even centuries). Weather is the day-to-day state of the atmosphere, and is short term (predicted in days or weeks).

⁷ <http://www.cru.uea.ac.uk/cru/info/warming/> based on Brohan et al. 2006, J. Geophysical Research)

It is predicted that if no action is taken to limit greenhouse gas emissions, the earth's temperature will rise at a faster rate than at any time in the last 10,000 years. The human costs include food shortages, health risks and economic damage. World wide the consequences are likely to be very serious, especially in developing countries where millions more people are likely to be exposed to the risk of extreme drought, disease, hunger & flooding. In Europe it is predicted that there will be an increased risk of flooding in relation to increased storminess.⁸ Events such as the 2003 heat wave will also become more frequent.⁹ Consequences include major health risks, fire risks, water shortages, soil erosion and subsidence.

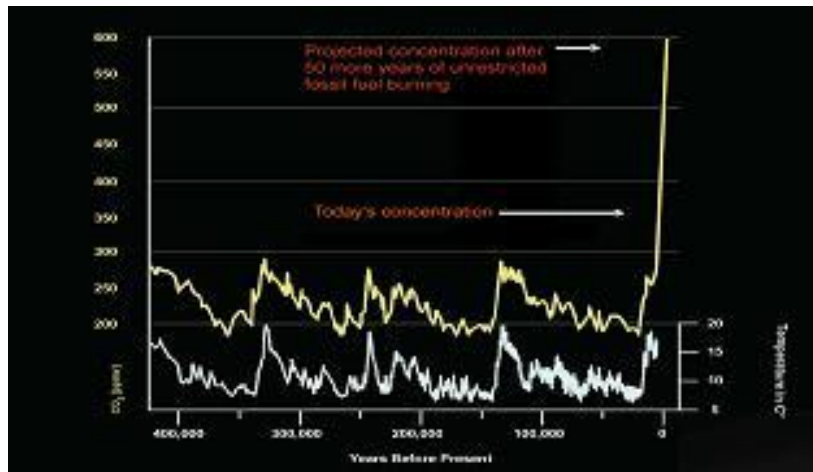


Figure Two - Graph illustrating global temperature change & CO₂ concentrations over time, Science Magazine

2.4 Climate Change – What Will It Mean For Worcestershire?

Worcestershire's climate is changing. We now have shorter milder winters, but increasingly extreme weather. In the next decade and beyond it is predicted there will be further climate change and the incidence of extreme weather will increase¹⁰.

Worcestershire's geography means that the county is susceptible to flooding. Major rivers flow through low lying areas and quite a lot of the soil is relatively impermeable¹¹ (i.e. Clay and Gley soils). This leads to a tendency to both fluvial (river) and flash flooding.

The Worcestershire Partnership commissioned a study into the **impacts of Climate Change in Worcestershire**. The study reported that it is highly likely that Worcestershire will see an increased rainfall intensity leading to greater flooding, more frequent and severe gales, warmer winters and hotter summers, more summer drought and increases in average temperatures (by up to 1.3 O C by 2020s and up to 4.5OC by 2080s.¹² Further detail on the impacts of climate change on the county can be found at Section 6.2.

Recent events have shown that **extreme weather** can strike twice in the same place in a short period of time in the County. For example, **Worcestershire's experience of flooding demonstrated** how uncertain the timings of flood events can be. In the last 15 years a 1 – in – 10 year flood event¹³ occurred every 2 years on the River Severn and a 1- in – 15 year event on the River Teme has occurred each year for the last 5 years.¹⁴ During the summer of 2007, the town of Tenbury Wells was hit by a '1 in 20-year' flood event in June and a month later was inundated by a 1 in 30-year flood, both from the River Teme. Between these incidences a further localised flood affected the town as the Kyre Brook overtopped its banks due to a localised thunderstorm. We are now able to more accurately forecast such events – but there is a growing need to be prepared for weather extremes and the subsequent consequences. The variability of weather systems is such that

⁸ IPCC 2007 Report

⁹ IPCC AR 4, WG2, chap 12, after Schaeret al. 2004

¹⁰ The impact of climate change in Worcestershire – G Cavan 2004

¹¹ These soils are difficult for water to pass through

¹² The impact of climate change in Worcestershire – G Cavan 2004

¹³ This means that flooding on this scale would only be predicted to happen once in the specified number of years

¹⁴ Source Hereford and Worcester Fire and Rescue Service response to Climate Change Strategy consultation

it is now essential to prepare for a range of eventualities - including floods and heat waves with associated droughts.¹⁵

Worcestershire residents believe that many of the impacts of climate change are already being felt in the county and where this is not already the case that they will do so in the future.¹⁶

Such changes will impact on Worcestershire's **environment, economy and society**¹⁷. For example: **Biodiversity**: Changing conditions may be beneficial to some species but harmful to others. For example, some species may be lost due to wetland habitats changing and drying up.

Geodiversity: Changing soil types and structures; soil erosion, leading to loss of peat soils and subsequent release of carbon dioxide; changes to streams and rivers

Agriculture: Problems caused by drought, floods and new crop pests.

Transportation: Roads may be less affected by frost and freeze/thaw but may be closed and damaged more often due to flooding. Higher temperatures are likely to affect roads, rails and associated structures.

Health Services: More heat related summer deaths and cases of food poisoning; fewer cold related winter deaths.

With these threats come **opportunities**. There are opportunities for individuals to reduce energy consumption in their homes and **save money** on fuel bills. Lifestyle changes such as reducing car use and walking or cycling can **contribute to health improvements**. There are opportunities for business in the so called "**green economy**" developing new products and services that respond to the need to reduce use of fossil fuel and subsequent CO₂ emissions and adapt to the changing climate. Leisure and tourism are important industries for the county. People may take more day trips and holidays in the UK due to the warmer weather and the worldwide global downturn. This could mean **more spending at local businesses**. The challenge is to ensure that this does not further threaten Worcestershire's environment.

The impacts of climate change do depend critically on **future greenhouse gas levels** in the atmosphere, which in turn **depend on level of emissions**¹⁸ and strategies to reduce the extent of global warming (mitigation¹⁹ strategies) - and these depend on **specific human actions**.

Worcestershire wants to **lead by example**. The Partnership strongly believes that **everyone can make a difference** and that we can all do more - both as individuals and as organisations. This Strategy demonstrates our commitment to translate that **belief into action**.

2.5 Climate Change: What Can Be Done About It?

Because 'greenhouse' gases stay in the atmosphere for such a long time, (CO₂ can stay for up to 200 years), whatever we do we cannot escape some climate change, but **the worst effects can be avoided if the greenhouse gases in the atmosphere are stabilised instead of being allowed to increase**. In order to avoid the worst impacts of climate change, many scientists agree that we must **reduce** our Climate Change gas emissions.

The UK government has adopted a national target to reduce greenhouse gas emissions by at least **80 percent before 2050** compared to 1990 levels. This target is in line with scientific thinking about the level of reduction that we need to make to limit the rise in the earth's temperature to 2⁰c by 2080 to avoid "catastrophic" climate change²⁰.

3. RESPONSES TO CLIMATE CHANGE

The issue of climate change probably has an even higher profile now than in 2005 when Worcestershire produced our Climate Change Strategy. Films such as Al Gore's: An Inconvenient Truth has further raised the public profile of this issue. The **scientific evidence** for the current reality of climate change has increased, and we are now better able to **predict future climatic**

¹⁵ The climate of the United Kingdom and Recent Trends - United Kingdom Climate Impacts Programme (UKCIP) 2008

¹⁶ The November 2007 Citizens Panel Survey asked about possible impacts of climate change now and in the future. Results can be found at <http://worcestershire.whub.org.uk/home/wcc-consultation-citizenspanel-november2007>

¹⁷ The impact of climate change in Worcestershire - G Cavan 2004

¹⁸ Definition of emissions - in this context used to describe the release of greenhouse gases into the atmosphere

¹⁹ Definition of mitigation - used to describe the actions aimed at reducing the extent of global warming

²⁰ Beyond a 2⁰c rise scientist's predict that certain mechanisms may arise that could significantly increase the rate of climate change e.g. further melting of the tundra which releases methane into the atmosphere, reduction the sea's ability to absorb CO₂ as it warms up.

scenarios. The need for action on climate change has become more accepted – at an international, national, regional, local and individual level.

3.1 The International Response To Climate Change

As part of the **Kyoto protocol**, the UK has agreed to ensure annual greenhouse gas emissions are at least 12.5percent below 1990 levels in the period 2008-2012

European Union heads of state have agreed that greenhouse gases must be reduced by 20percent by 2020 from 1990 levels. The European Climate Change Programme includes measures such as carbon capture and the EU Emissions trading scheme

3.2 The National Response To Climate Change

The UK Government response to climate change has been expressed through a number of vehicles; national planning policy, the Energy White Paper and the UK Sustainable Development Strategy ('Securing the Future'), as well as through business taxation policies e.g. the fuel levy.

The Government has also set a number of non statutory targets aimed at reducing emissions. In 2008 the UK Climate Change Act was passed. This represented a step change in action on Climate Change as the Act set a **legally binding target for reducing UK greenhouse gas emissions by at least 34 per cent by 2022 and at least 80 per cent by 2050, compared to 1990 levels.**

The Act:

- Requires the Government to publish five yearly carbon budgets as from 2008 and report on these annually
- Places a duty on the Government to assess the risk to the UK from the impacts of climate change
- Provides powers to establish trading schemes for the purpose of limiting greenhouse gas

The **Carbon Reduction Commitment**, to be introduced from 2010, will require big "non intensive" energy users such as hotels, supermarkets and large councils, to purchase a carbon allowance from the government for each tonne of carbon they emit – providing incentives to reduce emissions. Participants will be able to "trade" allowances if they purchase more allowances than required. An annual performance league table will be published showing the comparative performance of all participants.

3.3 The Regional Response to Climate Change

The **West Midlands (WM) Regional Climate Change Action Plan 2007** lays out a plan of action for regional organisations to progressively address the causes and impacts of climate change under the headings of planning & environment, economy, implementation, leadership, communication, targets and monitoring. The **WM Regional Energy Strategy 2004** sets targets for reducing carbon emissions by sector along with a regional target for renewable energy regeneration equivalent to 5percent of regional electricity consumption by 2010. The main emphasis of the strategy is on energy efficiency.

The **WM Regional Spatial Strategy** is being revised to include climate change policies and to ensure the issue of climate change is fully integrated with regional-level spatial planning.

The **WM Regional Economic Strategy 2007** includes objectives aimed at moving the region to a low carbon economy through improved energy efficiency, adoption of renewable energy and development of energy efficient technology.

Regional organisations are seeking to work together with councils and other organisations to implement this work at the local level.

3.4 Worcestershire's Response to Climate Change

This review of the Climate Change Strategy is a renewal of the commitment we made in 2005 to tackle the challenge of climate change. The three central pillars of our Strategy for Worcestershire are to:

- **Raise Awareness of the issue of Climate Change**
- **Reduce Worcestershire's Climate Change Emissions**
- **Plan for and Adapt²¹ to the Impacts of Climate Change**

²¹ Definition of adaption – taking action to adapt to the impacts of Climate Change

The second edition of Worcestershire [Sustainable Community Strategy \(SCS\)](#)²² deepened this commitment by identifying climate change as a “**cross cutting theme**” that underpins the whole community strategy. This means that all areas of the Partnerships activities, including all our strategies and policies, must take account of and address the issue of climate change. **Local Strategic Partnerships** for Worcestershire Districts have also highlighted climate change as a key issue for them. In 2008 **Worcestershire County Council** was one of 6 councils to achieve **Beacon Council status** in the area of Climate Change – obtained by leading by example on this issue and a willingness to share that experience with all partnership members and with other councils.

The **Worcestershire Climate Change Pledge** was developed to enable organisations to demonstrate their willingness to implement the Climate Change Strategy. Signing the Pledge commits organisations to **taking & publicising action** to reduce their own CO₂ emissions & working to make their own activities **climate resilient**. Actions are given a “star rating” ★ ranging from one to three, dependent upon the ease with which they can be accomplished. Each year organisations who have signed the Pledge are asked to report back on their activity and to renew their commitment to the Pledge. **The actions from the Pledge are highlighted in relevant sections of the Strategy to demonstrate the practical steps that organisations can take to support the implementation of this Strategy.**

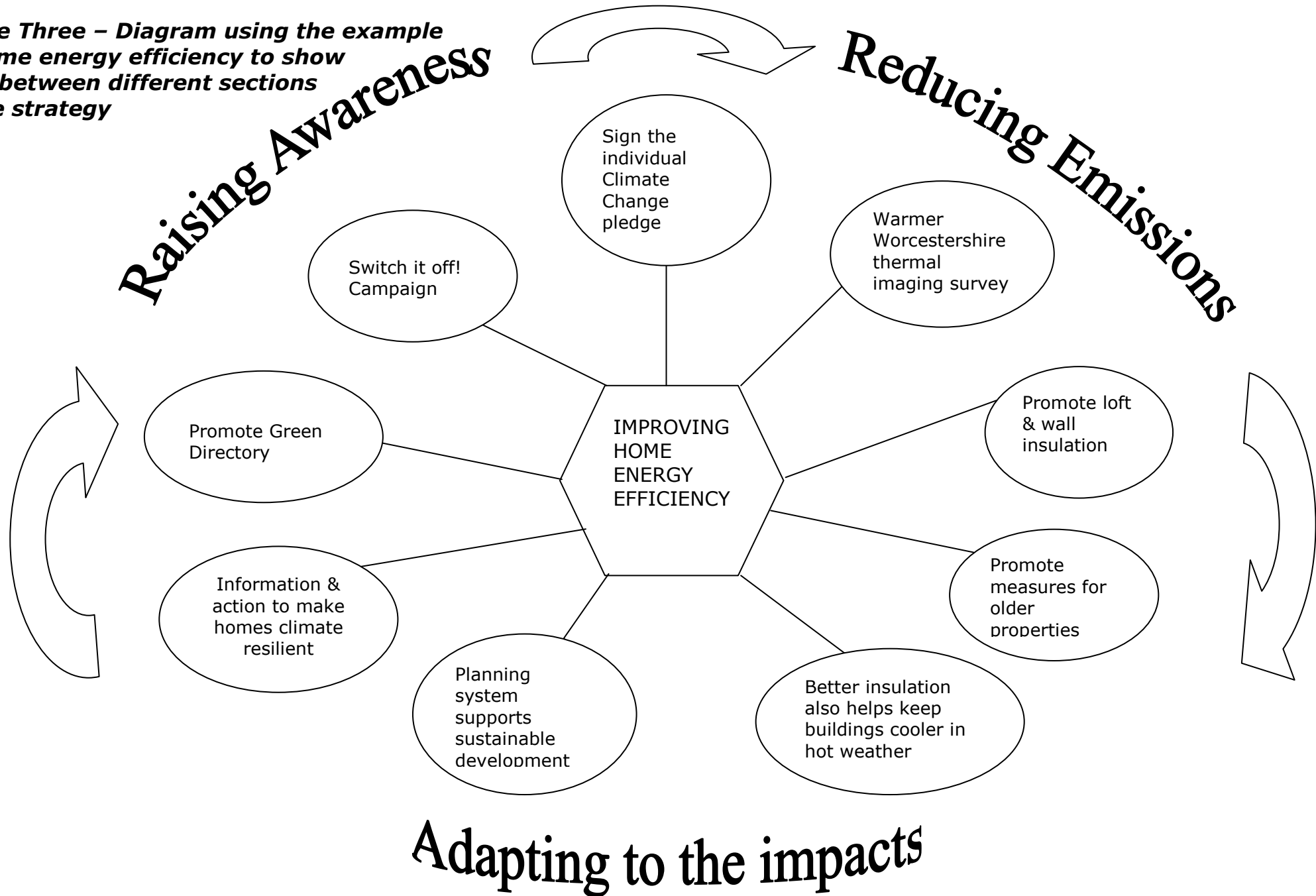
A **Climate Change Pledge for individuals** is being developed and will be available on Worcestershire County Council website.

The Partnership has agreed a number of **targets** that contribute to tackling climate change as part of its [Local Area Agreement \(LAA\)](#). This means that the whole Partnership is accountable to the Government for its performance against these targets. You can find out more about this in Section 7.

Although our Strategy is described in terms of the three central pillars set out above the reality is that **there are strong relationships between many of the issues addressed in the Strategy**. For example the necessity to raise awareness about climate change cuts across every area of the Strategy – so consequently you will find actions relating to awareness raising in many of the sections. For example reducing carbon emissions from transport requires awareness raising and practical action – but will also inevitably be affected by proposals for the built environment, in particular the location of new homes and employment in Worcestershire proposed through the Regional Spatial Strategy and Local Development Frameworks. There are lots of other examples - many of the issues addressed under the discrete headings above do not exist in “silo’s” but connect across many of our priority outcomes and will be knitted into the activity set out across the document and in our detailed action plans. The diagram below illustrates how just one area of the Strategy – Reducing carbon emissions from homes, requires action across many areas and how activities aimed at tackling one pillar of the Strategy can also impact on others.

²² Partnership Towards Excellence – The Sustainable Community Strategy for Worcestershire, Second Edition 2008 – 2013 sets out the strategic vision for the future of Worcestershire and tackles the main issues that will improve quality of life in the county such as crime, the environment, economic success, health and well being, meeting the needs of young people and building stronger communities

Figure Three – Diagram using the example of home energy efficiency to show links between different sections of the strategy



4. RAISING AWARENESS OF THE ISSUE OF CLIMATE CHANGE IN WORCESTERSHIRE

4.1 Raising Awareness of The Issue Of Climate Change With The Public, Community And Partnership Organisations And Businesses

4.1.1. Why is this important?

"Climate change will not be effectively managed until individuals and communities recognise that their behaviour can make a difference" –

The Royal Society, Climate Change: what we know and what we need to know (2002)

The original Strategy cited effective **awareness raising and education** as vital to successfully reducing emissions and adapting to the impacts of Climate Change in the County. In making everyone aware and encouraging them to do their bit we hoped to encourage everyone to become champions for action on climate change in their homes, businesses, schools and public and voluntary organisations throughout the County.

June & November 2007 Citizens' Panels showed a **high level of concern about Climate Change** in the County with 86percent concerned. The majority thought they could personally help to limit the effects of climate change and considered they were doing everything they personally could to tackle it; many people citing recycling waste, improving home energy efficiency, and taking steps to reduce emissions from car use as actions they were taking. People were unsure however whether businesses and public agencies were doing all they could.

It appears that **many people are informed** about the seriousness of climate change and are taking some action in their own lives and within businesses and other organisations. It needs to be acknowledged however that **a significant decrease in CO₂ emissions in the County has yet to occur**²³ and many organisations have still to consider the impact that Climate Change will have on their operations. We know that sometimes people **do not take effective action** for a number of reasons; they may feel overwhelmed by the enormity of the issue, or are confused about which actions will be most effective²⁴ or they may make contradictory choices – for example improving energy efficiency of a building, but then spending the savings on fuel hungry IT equipment.

The **positive changes** that **are** taking place need to be more **widely publicised**. The **benefits to individuals** (e.g. improved health through walking and cycling, savings from reducing expenditure on energy and "going green" by growing your own food, reusing and borrowing rather than buying etc.) and to **business** (e.g. savings from reducing expenditure on energy, opportunities to develop new services and products that are low energy or develop technologies that enable adaption to climate change etc.) need to be further **promoted and highlighted**. This is especially important in the light of the economic downturn.

In view of the seriousness of the situation far **more needs to be done at every level** and significant change is required. At every level, individuals and businesses alike need to be made aware of the serious impacts climate change will have on their lifestyles and livelihood. Urgent change is required. Messages need to be simple, clear and consistent, adopting a positive; **'we can do it'** approach. Raising awareness of climate change is a theme that **runs across every area of this strategy** – and you will find actions addressing this throughout.

4.1.2. What have we already done?

- Led by example – over 20 Worcestershire Partnership Organisations have signed up to the [Worcestershire Climate Change Pledge](#)
- Included "Climate Change" as a cross cutting theme underpinning the Worcestershire Sustainable Community Strategy and therefore the work of the Partnership and its strategies and plans
- Raised awareness of [Home Energy efficiency](#) through the work of the Home Energy Group

²³ See 5.1.1

²⁴ The Citizens Panel showed an apparently widely held perception that recycling is the most effective thing residents can do to help limit the impact of climate change, while it does have an impact there are many more effective things, such as improving home energy efficiency and driving less.

- Produced a **"Green Directory"** for the County, available through the internet
- In response to the challenge of peak oil (see 5.3) a number of community based, voluntary **'transition town'** organisations have been set up in the County e.g. **'One Planet Worcester'** and **"Transition Malvern Hills"** with the aim of helping their communities make the transition from dependency on high carbon fossil fuels to low carbon communities. Some councils in Worcestershire are providing them with support.
- Linked Climate Change to associated **campaigns** such as waste minimisation (e.g. Love Food: Hate Waste) and sustainable transport (Choose How You Move) campaigns
- Regularly published the online **Climate Change Newsletter**
- Regularly present **stalls at popular events** throughout Worcestershire raising awareness of home energy efficiency (e.g. Pedal in the Park, Three Counties Show etc.)
- Run briefing sessions for councillors
- Held a **Climate Change Conference** in June 2008 attended by over 70 stakeholders

Case Study - Switch It Off!

Since 2006 the **Switch It Off ! campaign** week has run across Worcestershire, Warwickshire and Coventry. This week long campaign aims to highlight how everyone can reduce their energy use, help the environment and ultimately save money! The week culminates in a two hour **Big Switch Off**, where everyone across the three areas are asked to make a special effort to switch off appliances/lights which do not need to be left on. This is monitored by Central Networks so the outcome of the campaign can be quantified. Every year a **drop in energy consumption** has been recorded. In 2008, Central Networks recorded a drop of 22MW during the Big Switch Off, which is the equivalent of switching the power off in over 3000 three-bedroom homes for a whole year. This emphasises that **small changes can make a huge difference**.



4.1.3. What are we aiming to achieve?

Translate the growing awareness of Climate Change into **significant action in homes, businesses and organisations** across the County.

4.1.4. What do we still need to do?

- Continue to develop and promote the **Worcestershire Climate Change Pledge**, encouraging Partnership organisations including community groups to take and publicise action to reduce their own CO2 emissions and make their own activities climate change resilient.
- Partnership **organisations** to continue encouraging their **staff and members** to tackle Climate Change at work, at school and at home
- Develop a range of ways that **individuals** can show their commitment to tackling Climate Change – for example by developing a **"Climate Change Pledge" for individuals**, and by identifying **local champions** to promote this issue
- Develop a co-ordinated approach to **Worcestershire's approach to sustainability and Climate Change** that links existing awareness programmes together such as the
 - 'Switch it Off' campaign
 - Local campaigns e.g. Pershore Energy Efficiency Project, One Planet Worcester
 - WCC waste & transport campaigns
 - Schools programmes
- Develop **new climate change awareness programmes** including climate change adaptation initiatives
- **Help, advise and resource practical actions** that people can take, tailoring the information provided according to the intended audience
- Implement the **"Warmer Worcestershire" Project** - The project involves an aerial thermal imaging survey of the entire county to produce a heat loss map, promotion of the results and work to target energy efficiency improvement measures, such as cavity wall and loft insulation, particularly at vulnerable households
- Support **"transition town"** movements in the County (see 4.1.2)
- Provide **up to date information** on climate change impacts and **signpost** sources of information & advice

Climate Change Pledge Action



Raise awareness of climate change issues with our staff and in our activities involving the general public e.g. through websites, in newsletters and at events

Case Study – A Joint Climate Change Officer for Redditch Borough Council and Bromsgrove District Council.

The neighbouring local authorities of Redditch BC and Bromsgrove DC are increasingly prioritising action on Climate Change. The two Councils have got together to appoint a joint Climate Change Manager. The Councils recognise that climate change does not respect local authority boundaries and that many issues and objectives are shared by the two authorities. The joint appointment will enable joint communications to residents across the two areas, as well as enabling them to make efficient use of limited resources, share actions, information, learning and resources.

4.1.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

Worcestershire's District and County Councils
Act on Energy
Worcestershire Home Energy Group
Worcestershire Wildlife Trust
Utilities
The Environment Agency
Chamber of Commerce
Worcestershire Environmental Business Group
Health Commissioners and providers
Voluntary and Community Organisations
Hereford and Worcester Fire and Rescue Service
Worcester Friends of the Earth
Local Media
One Planet Worcester
Transition Malvern
Energy Saving Trust

4.2 Raising Awareness Of The Issue Of Climate Change Through Education Settings

4.2.1. Why is this important?

"Educating people from an early age about how our actions influence the environment is a vital element in promoting responsible behaviour. Creative and practical ways can be found to help pupils translate the study of climate change into actions in their everyday lives." Nicholas Stern, October 2006

Formal education has an important role to play in raising awareness of the issue of climate change. Developing the **knowledge, understanding, values, attitudes and skills** of both formal and informal education settings and present and future generations will be vital as we prepare to meet the challenges facing us both in mitigating and adapting to climate change. Focusing on climate change in education lays the **groundwork for further action** at the level of family, school, community, further and higher education and business / organisation.

4.2.2. What have we already done?

- Led by example – we have established a **Learning for Sustainability Forum** with representation from the County and District Councils and local voluntary organisations and businesses working with schools around this theme
- Produced through the Forum a **Learning for Sustainability Strategy (LfSS)** which focuses on work with schools, pre-school / nursery and the need for more work with young people of school leaving age, both within formal and informal educational settings

- Enabled more than **230 schools** in Worcestershire to register with the international **Eco Schools Award Scheme**. This includes 80percent of all state schools in the County, which makes it the fourth highest percentage in the country
- **44 of these schools** have obtained the prestigious **Green Flag Awards**, the second highest figure in the country
- Several of Worcestershire’s High and Middle School Eco Action Teams have started working as **Ambassadors** with feeder schools, local parents etc. around the theme of climate change
- Worked with schools on a **Switch it Off Campaign for schools** that extends across Worcestershire, Warwickshire and Coventry. The Campaign has demonstrated the potential for energy saving for schools including some longer-term energy saving measures (e.g. IT systems shutting down overnight at a fixed time)
- The involvement with Eco Schools has been taken as a useful indicator within the Partnership’s [State of the Environment Report](#)
- The University of Worcester is developing an eco-programme to manage the University Campus

Case Study - Hagley Primary School ~ Green Flag Eco School – A “whole school approach”

- *The environmental audit (including energy, water, transport and waste) that is carried out as part of Eco Schools has been embraced by the whole school, as they have put the questionnaire onto their server so that all classes can assess the school’s performance and make suggestions for improvement, enabling ownership and participation by all.*
- *Each day, every pupil records on their class whiteboard how far they have walked to school and the pupils are collecting this data and ‘walking’ to different countries around the world, improving their carbon footprint and their geographical awareness. Some teachers are also joining in and ‘cycling’ to other countries through their cycle commutes.*
- *Monitoring energy use alongside monitoring the weather through their weather station enables them to accurately analyse energy consumption and develop critical thinking skills around changes in their consumption.*

4.2.3. What are we aiming to achieve?

Everyone involved in education, formal and informal, at all levels, will play a key role in creating a more sustainable future, locally and globally

4.2.4. What do we still need to do?

(Note specific numerical targets listed below are to be achieved by **2013**)

- **Increase** by 40percent the **numbers of schools** engaged around the theme of climate change through work on becoming Sustainable Schools (DCSF)
- **Increase** by 40percent the number of **Green Flag Ecoschools**
- **Increase** by 5 percent the number of **Green Flag nurseries**
- **Increase** the number of **high schools** (by 20 percent) and **Further or Higher Education** settings (by 20 percent) working with students as **Ambassadors** around the theme of climate change and sustainability
- Meet the specific targets in the LfSS on pupils leading **audits on energy, transport, water use and waste in school** through working with schools on action planning, monitoring and evaluation to help schools track changes and progress
- Support **curriculum development**, making links with the Education Business Partnership and supporting work with colleges of further and higher education and the University
- Share the work that goes on in school with a **wider community** - focusing on encouraging schools to help encourage more awareness, auditing and action planning with local groups within the community
- The University of Worcester will promote environmentally sustainable ways of working and living, and encourage students to act in a sustainable and environmentally enhancing way
- Work with **pre-school, family and young adults** on climate change - taking a partnership approach to building awareness and action around climate change priorities

4.2.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

Worcestershire County Council and District Councils
Schools and Colleges
Teachers in Development Education ~ TIDE

Education Business Partnership (EBP)
University of Worcester
Worcestershire Wildlife Trust (WWT)
Duckworth Worcestershire Trust (DWT)
Worcester Resource Exchange (WRE)
Forestry Commission
Top Barn and Worcester Slow Food
3 Counties Agricultural Association
Worcestershire LfS Champions Group
Severn Trent Water (STW) ~ advisory
Worcester Cathedral Global Dimensions Base (at Hagley Primary School)

5. REDUCING WORCESTERSHIRE'S CLIMATE CHANGE EMISSIONS

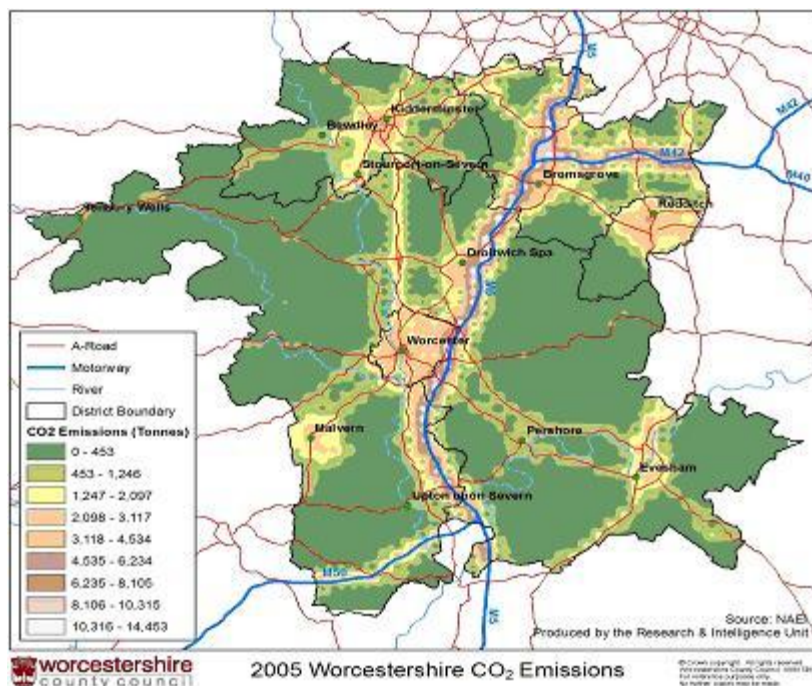
5.1 Where Are We Now? - Worcestershire's Current CO₂ Emissions

This strategy concentrates predominantly on the **reduction of CO₂ emissions**, since these make up by far the largest proportion of climate change gases. Actions needed to reduce other greenhouse gas emissions, such as Methane from waste disposal and livestock (methane is a 23 times more potent greenhouse gas than CO₂), are also addressed.

5.1.1. Emissions Data

The map below illustrates the location of the **main sources of CO₂ in the County**. Emission sources are mainly concentrated around towns and transport routes, and remote concentrations of emissions are also located at industrial estates and electricity sub stations.

Figure Four - Emissions of CO₂ tonnes per year in Worcestershire 2005 (source: NAEI*)

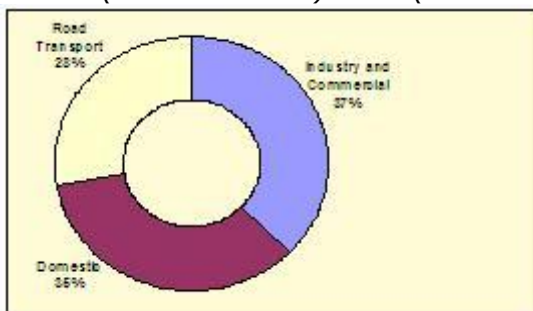


A Local Authority area CO₂ emission by sector data is now published annually by DEFRA. The first year for which this available is 2005 and this year provides **the "baseline"** for Worcestershire's CO₂ reduction targets. Total emissions for Worcestershire in 2005 were 4.8 million tonnes. Data includes emissions from energy use in homes & businesses and from transport (including motorways). **When motorways are excluded the emissions total in 2005 was 3.9 million tonnes.**

The government now reports on a series of national indicators on a local authority level. One of these is NI 186; **'total CO₂ emissions per head of population'**. This indicator excludes emissions over which there is limited local control, such as motorway emissions, (which for Worcestershire equate to approx 900,000 tonnes CO₂). It is the emissions reported via NI186 (i.e. the domestic, business, public and voluntary sectors and transport sectors) that will be the focus for Worcestershire Partnership organisations & this strategy- since it these over which the Partnership can have some impact.

The diagram below shows NI 186 **CO₂ Emissions by Sector in Worcestershire in 2005**.

Figure Five - CO₂ emissions by Sector (Worcestershire) 2005 (Source DEFRA)



Excluding motorways, Worcestershire's business, (including public and voluntary), sector produces the greatest proportion of the County's CO₂ emissions (37 percent), with the domestic sector not far behind (35 percent).

Worcestershire's homes, businesses, public organisations and transport (excluding motorways), generated an estimated 3.9 million tonnes of CO₂ in 2005; approximately 7.1 tonnes per person. This is slightly higher than the regional average (6.9 tonnes per person) and slightly lower than the national average, (7.4 tonnes per person). A tonne of CO₂ would fill a 10m-diameter hot air balloon.

5.1.2. Trends in Emissions Data

In 2007 total UK CO₂ emissions were approximately 8 percent below 1990 levels.²⁵ This is mainly due to a switch to the use of gas in generating electricity rather than coal and oil. Since the start of this century CO₂ emissions appear to have stabilised in the UK, however in the years from 2002 – 2006 emissions have been rising gradually in the business and transport sectors with little change in the domestic sector²⁶.

To date consistent Worcestershire level data is only available for 2005 and 2006 so no trends can be assumed, but figures show a 3% increase in overall Worcestershire emissions from 2005 to 2006, with a slight increase in the domestic sector and a significant increase in the business sector. This increase can be attributed in some part to an increased use of coal for generating electricity in the UK in 2006.

CO₂ emissions by district

Local Authority	Per capita emissions (t) 2005	Per capita emissions (t) 2006	% change per capita CO ₂ emissions (t)
Bromsgrove	6.1	6.3	2.48
Malvern Hills	6.9	7.3	5.61
Redditch	7.5	7.8	5.05
Worcester	6.5	6.3	-2.85
Wychavon	8.8	9.3	5.53
Wyre Forest	6.2	6.2	0.85
WORCESTERSHIRE	7.1	7.3	3.00

The above table shows the per capita CO₂ emissions for each district and the County average for 2005 and 2006 also indicating the percentage change between both years. The only district to reduce CO₂ emissions between 2005 and 2006 has been Worcester City. All other Worcestershire districts increased their CO₂ emissions, most notably Malvern Hills, Wychavon and Redditch with increase of over 5%. The main reason for this increase is the rise in emissions from industry and commerce sectors. All districts reduced CO₂ emissions from road transport. In 2006, Wychavon

²⁵DEFRA.http://www.defra.gov.uk/environment/statistics/globalatmos/download/xls/ghg_annex_a_20080327.xls

²⁶ www.defra.gov.uk/environment/statistics/globalatmos/gakf07.htm

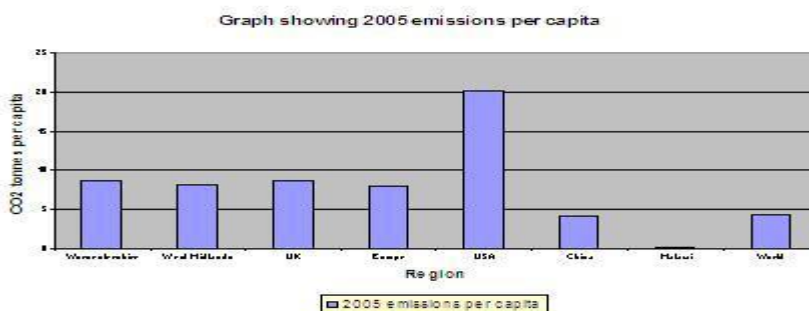
produced the largest proportion (27%) of Worcestershire's CO₂, with the greatest percentage of those emissions (45%) coming from industry and commerce.

Not all districts emit their greatest amount of CO₂ from the same sectors. Bromsgrove, Malvern Hills and Wyre Forest all have the domestic sector as the largest emitters of CO₂, while Redditch, Worcester and Wychavon all show industry and commerce as the greatest emitter.

The Government is constantly refining area based CO₂ emissions data, but it is not anticipated any major amendments will be made in the way these emissions are calculated over the timescale of this strategy.

It is useful to consider the figures in a wider context – comparing performance in Worcestershire and the UK to other countries. The bigger picture shows that Worcestershire, the West Midlands and the UK have higher per capita emissions rate than in Europe and China, but are far exceeded by the USA. Reducing CO₂ emissions is an issue that needs to be tackled “globally” as well as “locally”

Figure Six – Graph showing 2005 CO₂ emissions by capita



The per capita figures for UK, Worcestershire and West Midlands are taken from DEFRA and include emissions allocated to household, business, transport (including motorways) & land use. The emissions for other countries and the World are taken from Energy Information Administration (EIA) and are 2005 per capita emissions from consumption and flaring of fossil fuels.

5.2 Emissions Reduction Targets

Through the [Local Area Agreement](#)²⁷ the Worcestershire Partnership has agreed a reduction target for NI 186 ‘total CO₂ emissions per head of population’ for Worcestershire.

The target is a 9 percent reduction in CO₂ emissions per capita from 2005 levels by 2011.

The Government has agreed to play its part in this reduction contributing **7.1 percent from national measures** (such as legislation, carbon trading, strengthening building regulations, national energy and planning policy etc.). This means the Worcestershire Partnership is responsible to the UK government for achieving **at the very least a 1.9 percent reduction in CO₂ locally from 2005 levels by 2011** (approx 75000 tonnes reduction).

Distributed to the different sectors this local target means a reduction in CO₂ emissions by 2011 as follows;

Housing - at least 26250 tonnes reduction

Transport - at least 21000 tonnes reduction

Business, public sector & voluntary organisations - at least 27750 tonnes reduction

We must go further. This strategy aims to start the long-term process of achieving **at least** a 34 percent cut in emissions by 2022 and **at least** 80 percent reduction in emissions by 2050 compared to 1990 levels in line with **national targets**, and ultimately becoming a **carbon neutral** County.

Using a carbon estimation tool developed by the Energy Savings Trust and Marches Energy Agency (‘Low Carbon Leadership’ - 2008) and County data, the following are given as examples of the potential for reduction in CO₂ emissions in the County; these are annual figures.

Housing - 100 percent filling of existing unfilled cavity walls = 23,000 tonnes reduction CO₂

²⁷ For more information on the LAA see Section 7 and follow the link above to the Worcestershire Partnership website

Transport - 2 percent take up of measures in section 5.4.4 = 38000 tonnes reduction CO2
Business, public sector & voluntary organisations - 100 percent implementation of basic energy efficiency measures = 149,000 tonnes reduction CO2

Because it is extremely difficult to show whether a change in the DEFRA figures for NI186 is due to local or national measures, the Partnership will need to develop a robust way of estimating the amount of CO₂ reductions that can be attributed to local activities to enable more accurate reporting and monitoring against the indicator. The Energy Saving Trust is developing a tool that can be used for this purpose.

5.3 Achieving Emissions Reduction Targets

Achieving these targets will be challenging – the rural nature of parts of Worcestershire creates demand for transport, often the private car. A large proportion of Worcestershire’s housing stock is old, and that can make it more difficult to improve its energy efficiency. There are requirements for increased housing and associated economic development across the County that could lead to an increase in CO₂ emissions. It will be critical to ensure that new development is undertaken in a sustainable way if reduction targets are to be met.

Meeting the target will require change at every level in order to achieve significant CO₂ reduction. We all have a role to play, and we must all do more. The rest of this section describes the **actions** that will take place to meet these targets.

The greatest reductions will be achieved by **reducing energy use and improving energy efficiency**. The domestic sector (homes) offers good potential for CO₂ reduction, but action is also needed to reduce energy use across the public, voluntary, and the commercial and industrial sectors.

Reducing the reliance on the private car through the **promotion of walking, cycling and passenger transport infrastructure and services** will contribute to lower emissions. Other policies such as encouraging **locally produced goods and services** and **planning policies** that reduce the need for travel will also play a part.

As our learning increases we are becoming more aware of how **land use** can either contribute to or mitigate against CO₂ emissions. We want to promote land uses that capture greenhouse gases, rather than release carbon into the atmosphere

Minimising household waste and that produced by the industrial and commercial sectors, reducing the amount of all wastes that are sent to landfill sites, and exploring the potential for using waste products as a useful resource such as compost will also contribute to the target.

An independent study has been commissioned to provide an objective assessment of the realistic capacity of the County to generate **renewable energy** at the larger scale. We will continue to support the development of renewable technologies and the use of renewable energy sources where possible and appropriate throughout the County.

Peak Oil & Climate Change

The emergence of the issue of Peak Oil adds even greater urgency to the drive to reduce our reliance on oil and adopt low and no carbon alternatives for energy.

***Peak oil** is defined as the period during which the maximum rate of global petroleum extraction is reached, and subsequently declines. This point is fast approaching and shortages of oil and gas may begin to be experienced by the UK within the next five years and as early as 2011.*

*“The availability and price of oil affects almost every aspect of our economy and our day-to-day lives: the way we travel, where we work, what we eat, how we power our homes and buildings; and how we manufacture goods.” *The Oil Crunch: Securing the UK’s Energy Future* Oct 2008 The Peak Oil Group*

Action taken to tackle peak oil has strong potential to make a major step change in reducing carbon emissions.

In response to this issue a number of "transition" groups have been set up across Worcestershire to encourage local communities to make the transition from dependency on oil and other fossil fueled forms of energy to minimize reliance on fossil fuels.

5.4 REDUCING ENERGY USE IN WORCESTERSHIRE

5.4.1. Improving Home Energy Efficiency

5.4.1.1. Why is this important?

In 2005 the energy use in Worcestershire's homes accounted for 1,402,000 tonnes of CO₂, which is **35 percent of total CO₂ emissions for that year. It is also a sector that has a big potential for reduction of CO₂ emissions through increased energy efficiency**, for example loft and cavity wall insulations, high efficiency (A rated) boilers, and use of low energy appliances such as low energy light bulbs and fridges.

It is estimated that if all the homes in the County with unfilled cavity walls had them insulated a total of 23,500 tonnes CO₂ would be saved every year, (that's nearly the whole of the target we have been set for reducing emissions from our homes).

Improving energy efficiency has other benefits. **Fuel poverty** results from a combination of high energy costs, inadequate insulation, uneconomical heating systems and low incomes. In 2008 in the UK the number of households in fuel poverty is approximately 3.6 million²⁸ and this figure is estimated to reach 5.9 million by the end of 2009²⁹. Energy prices rose dramatically in 2008. The average household bill for gas and electricity was £1,400. In 2003 the average bill was £572 – a rise of 250%. This is why it is essential to ensure we maximise the potential savings that can be made through energy efficiency.

A large number of homes in the County are **difficult or expensive** to improve in terms of energy efficiency. For example they may not have cavity walls that can be insulated, they may not be connected to the gas network, they may be in a conservation area or listed, which can restrict the energy efficiency improvements that can be made. Such properties may require expensive solid wall insulation and installation of renewable energy.

5.4.1.2. What have we already done?

- Led by example - Worcestershire has been working to deliver its **obligations under the Home Energy Conservation Act**, which requires all district councils to improve the energy efficiency of its homes. The Target was to achieve a 30 percent improvement by 2012. Worcestershire is on target to achieve this and **for 2007/2008 has achieved a 26 percent improvement** against the 1996 baseline measure (27,148,059 GJ)
- Worcestershire Councils have been working to deliver energy efficiency improvements in a variety of ways. This has included:
 - Free **insulation schemes** for vulnerable households.
 - Redditch Borough Council has offered a **Council Tax Rebate Scheme** – when insulation is installed through this scheme the household receives a one off discount from their council tax.
 - **Worcestershire Home Energy Group** – promoting energy efficiency and affordable warmth countywide
 - District/Borough led **affordable warmth action plans**
 - **Free home energy advice** available to all residents in Worcestershire
 - Provision of schemes offering **discounted insulation and free low energy light bulbs**
- Included an indicator on tackling Fuel Poverty (NI 187) in our Local Area Agreement.

²⁸ National Energy Agency

²⁹ National Housing Federation

Case Study - Wychavon Warmer Homes

The project used thermal imaging technology to identify poorly insulated homes across all housing stock in the District. The Project Team then encouraged the installation of energy efficient measures across all tenures, but particularly targeting vulnerable households. The result was over 2500 households were assisted in installing measures such as loft and wall insulation and efficient heating systems. Of these households 70 percent were occupied by targeted vulnerable residents.



5.4.1.3. What are we aiming to achieve?

Contribute to the **local delivery** of National Indicator 186 – 1.9 percent local reduction in CO₂ emissions from 2005 levels - this equates to **a reduction of at least 26250 tonnes CO2 from the housing sector by 2011**. This will be achieved through local measures such as:

- Focus on the domestic sector to deliver its proportion of NI186 target
- Continued delivery of home energy advice to householders
- Ensure that residents of Worcestershire have access to affordable and warm homes through the implementation of local delivery plans for affordable warmth, and the inclusion of NI187 (fuel poverty) in that indicator.

5.4.1.4. What do we still need to do?

- Delivery of **awareness campaigns** across the County utilising best practice from other authorities. This will include:
 - Promotion of 'Switch it Off' campaign
 - Local campaigns e.g. Pershore Project, One Planet Worcester
- Increase the **number of energy efficiency measures** undertaken in homes across the County. This will include:
 - 80 percent of Worcestershire homes using at least 4 low energy light bulbs by 2011
 - 500 installations of loft insulation per district per year
 - 500 cavity wall installations per district per year
- Delivery of the **Countywide Affordable Warmth Strategy**, including developing local delivery plans for all districts by March 2009
- Worcestershire Partnership has been successful in a bid for £92,000 for the **Warmer Worcestershire project**. Mirroring the work in Wychavon the project involves an aerial thermal imaging survey of the entire county to produce a heat loss map, promotion of the results and work to target energy efficiency improvement measures
- **Work with those involved in building conservation** in order to understand how energy efficiency can be improved for listed buildings or homes in conservation areas
- Provide **information to householders in older properties** to inform them of the steps that they can take to improve energy efficiency
- Develop **loan schemes for householders** to provide funding for homes that are difficult to insulate e.g. solid wall insulation
- Work together to **access further funding to improve the energy efficiency** of Worcestershire's homes
- Continue to work with **Registered Social landlords** to identify energy initiatives and to build up a picture of the energy efficiency of the social housing stock – e.g. Wychavon DC have secured £35,000 for a solar thermal water heating project with Rooftop Housing

Climate Change Pledge Action



Insulate our own homes properly and encourage our staff to do so

Case Study - Energy Efficiency in Housing

A 3 Bed semi-detached property in Worcestershire was surveyed in October 2008 to assess the energy rating and running costs of the property using RDSAP³⁰ 2005 (Reduced Standard Assessment Procedure). The results are below;



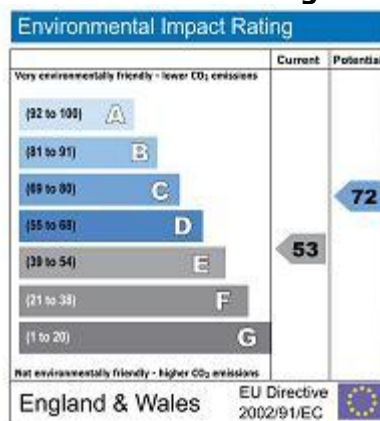
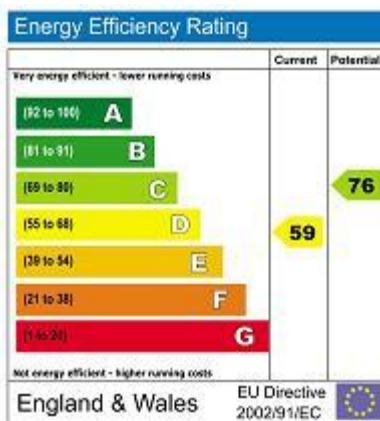
- **Energy rating D**
- **SAP rating 59 (out of 100)**
- **CO2 - 4.4 tonnes per year**
- **Fuel costs £690 (incl. heating, hot water & lighting only)**

If installation of the following were to take place:

- 270mm of Loft insulation
- Cavity Wall Insulation
- CFL's (low energy lightbulbs)
- Upgrade heating controls
- 'A' rated boiler

the rating of the property could change as follows:

- **Energy Rating C**
- **SAP rating 76**
- **CO2 - 2.6 tonnes per year**
- **Fuel costs £445 (incl. heating, hot water & lighting only)**



The cost of upgrading this property to achieve an improved SAP rating of 76 would cost approximately:

Loft Insulation	£400
Cavity	£400
CFL	£ 20
Upgrade heating and controls	£2,700

Total cost £3,520

This cost could be reduced further through accessing potential grants/subsidies, e.g. CERT³¹ funding (available to all) which would provide approximately 35-50% of the insulation costs.

The energy and environmental rating could be improved further through the installation of renewable technologies such as solar hot water or photovoltaic panels. This could increase the SAP rating up to 88 and Environmental Impact up to 84.

³⁰ SAP stands for Standard Assessment Procedure, a procedure used for measuring the overall energy efficiency of a property
³¹ CERT stands for Carbon Emissions Reduction target – this is a statutory obligation on energy suppliers to achieve carbon reduction targets by encouraging householders to take up energy efficiency and low carbon measures

5.4.1.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

All six district councils
Worcestershire Primary Care Trust
Worcestershire County Council Social Care Services
Social Housing Providers
Age Concern
Act on Energy (formally WEEAC)
SAFFA
Fire Service

5.4.2. Improving Energy Efficiency in the Business, Public and Voluntary Sector

5.4.2.1. Why is this important?

The business, public and voluntary sector produces **37 percent** of Worcestershire's carbon emissions from energy use in buildings and in industrial processes. (This sector is also responsible for a large proportion of emissions from transport.) In the UK it is estimated that business activities account for about half of all greenhouse gas emissions³². Whilst the 2005 strategy described a decrease in emissions from heavy industry in the county, emissions from Worcestershire's business sector as a whole rose between 2005 and 2006.

Reducing CO2 emissions in the business sector is a challenging task. The Worcestershire Partnership has to work within the constraints of the **Regional Economic Strategy** and the **Regional Spatial Strategy** and must balance economic interests against environmental sustainability. The **West Midlands Economic Strategy** sets the challenge for the county of achieving economic development whilst moving to a low carbon economy and recognises the growth potential of environmental technologies.

A recent survey carried out by Chambers of Commerce across the country on a **national sample of 3,000 businesses** showed:

- Nearly nine out of ten companies reported that they recycle while just over half use energy efficient products.
- A third of businesses provide training to their employees to reduce emissions while a quarter have developed energy management policies to limit their impact on the environment.
- Only a third of businesses stated that climate change is low on their priorities in these economically challenging times.
- Nine out of ten respondents claimed that energy costs were likely to influence their response to climate change.
- 62 percent of businesses claim the most effective policy Government can use in reducing carbon emissions are energy efficiency policies.

Reducing the emissions that are produced by the business sector can be done in a variety of ways, the most important being the **efficient use of energy and fuel**, which may involve changing some processes and systems. It can involve looking at business processes and logistics. It may also mean utilising renewable energy. Often, working on these new methods and approaches can lead organisations to identify other efficiency improvements and innovations that will also bring benefits, **increasing resilience and financial savings** in a time of volatile fuel costs and difficult financial conditions. Businesses need to grasp the opportunities offered by **developing the "green" economy** and maximise business opportunities i.e. developing new 'environmental' products/technologies.

As well as these positive incentives big energy users will become subject to **increasing regulation**, such as the Climate Change Levy and Carbon Reduction Commitment (see Section 3.2), which serve

³² CBI 'Climate Change is everyone's business' 2007

to accelerate the need to improve energy efficiency even further. There are therefore clear drivers for business to take this issue seriously.

For the **public and voluntary sector** taking action to improve energy efficiency should mean more money to spend on service provision and also serve an important **community leadership role**. For large energy users e.g. hospitals, University of Worcester, the County Council, the **carbon reduction commitment (carbon trading)** could mean a significant cost to those organisations that fail to reduce their emissions. All Local Authorities also now have to report on their CO₂ emissions through a national performance indicator - **NI185 which measures CO₂ reductions from Local Authority operations**.

An area of growth will be the so called "**green collar**" workforce, people who have the skills necessary to meet some of the challenges that climate change will pose. **Skills need to be developed in many areas such as energy efficiency, renewable energy, carbon accounting and sustainable procurement**. Whilst the education of those still at school & in college is important, action needs to be taken within organisations now and it is only by developing the skills of the workforce and retraining that real progress can be made.

Small things – Big Wins!!

It is estimated³³, that if the basic energy efficiency measures included the Climate Change Pledge, such as installing low energy light bulbs and reducing thermostat temperatures by 1oC, were carried out in all businesses and organisations in Worcestershire, 149,000 tonnes of CO₂ a year could be saved. This would meet the total target we have been set nearly twice over!

5.4.2.1. What have we done so far?

- Many **major energy users in the County have already introduced energy efficiency measures** as part of the overall process of controlling input costs. The numbers of businesses seeking energy efficiency assistance has increased as energy and fuel costs have risen.
- The Worcestershire Environmental Business Group has organised a series of **seminars for businesses to pass on good practice**.
- **Research** is being carried out by a number of businesses in the County to **develop new technology and products** that help to reduce environmental impact or energy use.
- A **Logistics Forum** has been launched by the Chamber of Commerce to help businesses improve logistical efficiency with a consequent reduction in environmental impact.
- The **Worcestershire Economic Strategy** includes the following as priorities; the improvement of environmental performance of businesses and the need for energy efficiency and low carbon forms of energy in infrastructure development such as the Central Technology Belt
- A number of public sector organisations have put **carbon management programmes** in place such as Worcester University and Worcestershire County Council. Wychavon Council has developed a climate change plan incorporating energy efficiency measures in its own estate.
- **Community First** operate a **Community Building Advisory Programme** which includes advice on improving the energy efficiency of community buildings.
- **Worcester Diocese** is working to deliver its environmental strategy, which includes improving the energy efficiency of its properties
- Promoted the **Buy Local** campaign run through the Worcester News

³³Low carbon leadership 2008 – MEA & EST)

Case Study - Morgan Advanced Ceramics Energy Saving Approach – Stourport on Severn

The ceramics industry is a heavy user of energy, due in no small part to the firing process that is needed to create products. Energy is also needed in other production activities, (e.g. to formulate glazing powders), power equipment and provide heating and lighting.

In order to reduce energy consumption the business took the approach of consolidating the bulk of its operation into 4 days from 5. The assistance of the work force has enabled the company to:

- *reduce the amount of heating and lighting required*
- *operate main shut off switches to ensure plant is turned off and isolate non-operational areas*
- *increase productive hours owing to reduced start up/close down operations. It has also made it easier to maintain heating over the period.*

In addition, major pieces of equipment have had invertors fitted, thereby reducing energy demand. Other changes implemented include the fitting of light proximity sensors and changing of light tubes to more efficient types.

New energy meters have been fitted across site so that costs can be more accurately allocated and all of this is being supported with an energy awareness campaign. The knowledge and experience of the employees has been essential in tackling energy consumption.

5.4.2.2. What are we aiming to achieve?

Contribute to the **local delivery** of National Indicator 186 – 1.9 percent local reduction in CO₂ emissions from 2005 levels - this equates to **a reduction of at least 27750 tonnes CO₂ from the business & public sector by 2011.**

In the longer term to achieve the **transition to a low carbon society and economy** with minimum reliance on fossil fuels

5.4.2.3 What do we still need to do?

- All Local Authorities will be working to reduce CO₂ emissions across all their operations – this is reported through a national performance indicator (NI 185) and will make a contribution to our LAA target.
- Continue to **raise awareness** of the need to reduce energy use amongst businesses and public sector, particularly in the light of rising fuel prices and difficult financial conditions
- Produce a **guide to reducing emissions**, showing some of the typical savings that can be made in order to encourage more reductions
- **Lobby Government** to offer credits, perhaps through taxation, to increase investment in more environmentally friendly equipment.
- Promote **one to one discussion** with businesses, their representative organisations and public sector organisations on this issue, with the aim of encouraging them to join a wider network or environmental business group to help them share best practice.
- Promote the **procurement of local products and services**
- Explore with **regulatory agencies** (e.g. Trading Standards and Environmental Health) the potential to raise with businesses the issues of reduction and adaption to climate change and signpost help and information as part of their regulatory activity.
- Encourage and promote **information on climate change** that is presented in a way that is attractive to businesses and will encourage change.
- Work with Business Link to **increase the provision of energy efficiency advice to businesses** especially small & medium enterprises
- Support the **extension of the Rethink energy programme** (supporting uptake of renewable energy by businesses) to the whole of the County
- Work to **develop the environmental technologies cluster**
- Explore the potential for **skills development**, for example through contributing to the regional ESF funded 'skills for climate change' scheme.
- The University of Worcester are seeking funding to consider how the EcoCampus approach can be extended to the Further Education sector. They are also commissioning a feasibility study to explore establishing combined heat and power (CHP) and district energy centres at both the City Campus and St Johns Campus.

Climate Change Pledge Actions



Ensure that our organisation monitors our energy use e.g. through regular accurate meter readings
Obtain advice and / or financial assistance to improve energy efficiency and save money at work



Reduce our organisation's energy use e.g. through switching off appliances when not in use, better insulation, using energy efficient appliances and plant etc.

Set up systems to monitor, report our greenhouse gas emissions and set a reduction target



Operate a low carbon / sustainable purchasing policy e.g. using local suppliers to reduce transport costs and emissions, buying energy efficient products etc.

Key Agencies

All members of the Worcestershire Partnership.

The following agencies will have a key role in delivering this part of the Strategy: -

Worcestershire's District & County Councils
Herefordshire & Worcestershire Chamber of Commerce
Business Link
Act on Energy (previously WEEAC)
Welcome to Our Future
West Mercia Supplies
Marches Energy Agency
Worcestershire Ambassadors
University of Worcester
Worcester College of Technology
The Carbon Trust
The Energy Savings Trust

5.4.3. Sustainable New Development

5.4.3.1. Why is this important?

Buildings contribute almost half of the UK's carbon emissions, with our homes accounting for around 27 percent³⁴. By looking at where & how developments are built, and the way that existing buildings are refurbished, it is possible to **reduce these emissions**.

Current indications suggest that 36,600 new homes need to be built in Worcestershire between 2006 and 2026, together with significant new commercial & industrial buildings.³⁵ This proposed level of development provides an opportunity to significantly increase the sustainability standards in construction.

Factors such as the **location, orientation, and design of buildings** have a huge impact in terms of affecting need to travel, the ability to benefit from passive solar gain (warmth from sunlight), shelter from trees, efficient use of materials and energy use for water, heating & lighting.

5.4.3.2. What have we already done?

- Led by example - sustainable construction techniques have already been employed in some **exemplar developments across the County**, such as Redhill School in Worcester. Demonstration buildings including the Bishops Wood Centre near Stourport on Severn, and the Duckworth Trust Pump House Centre in Worcester are also important in showcasing low-carbon developments.
- The UK's Building Regulations set standards on the energy efficiency of new buildings. However, the national **Code for Sustainable Homes** provides target levels for new homes to achieve

³⁴ 'Greener Homes for the Future', Department for Communities and Local Government (May 2008)

³⁵ West Midlands Regional Spatial Strategy Phase Two Revision Draft - Preferred Option, December 2007, WMRA

improvements in:
Energy and CO₂ Emissions;
- Pollution;
- Water; Health and Wellbeing;
- Materials;
- Management;
- Surface Water Run-off;
- Ecology; and
- Waste.

- Similar standards for non-domestic buildings are provided by **BREEAM**³⁶.
- Nationally, the Government has set a **target for all homes to be zero-carbon by 2016**, with stepped progression to this level.
- **Housing associations** such as Redditch Co-operative Homes are also seeking to ensure that sustainability is a key factor determining their designs.

Case Study - Eco housing developments in Redditch



AFTER the success of introducing eco housing at Farm Road and Sillins Avenue in Redditch with the help of the Norwegian eco house builder, Hedalm Anebyhus, a new scheme is heading for completion. Walton Close in Winyates is a development of 19 homes for rent incorporating the very latest in Norwegian and British eco and energy efficient design. The mixed development comprises two-bedroom flats, two-bedroom houses, three-bedroom houses and a four-bedroom house; alongside a small pond and some green space. The area under development has been regenerated and all flats and houses will be rented through Redditch Co-operative Homes. They will be offered to people on the waiting lists held by Redditch Co-operative Homes and Redditch Borough Council.

The houses are once again flatpack structures being shipped over from Northern Norway and have a natural timber finish. But this time there are new innovations with rooms designed for long term stay and a separate dining room being created in some of the houses.

British workers have been trained to fit the exterior panels, and electrical sockets and other design features are all British.

The homes are low carbon and have led to a sixty per cent reduction in fuel bills elsewhere.

Redditch is the only council with Norwegian eco homes, to date, and so successful have they become, that more developments are planned.

5.4.3.3. What are we aiming to achieve?

We want to see **construction** that **reduces environmental impacts**.

Local authorities can seek to **advance beyond the Government's timetable for achieving Code for Sustainable Homes ratings for specific justified areas**. Any proposals to do so would have to be tested through the process of preparing District **Local Development Frameworks**³⁷.

Encourage the use of the [West Midlands Sustainability Checklist](#), which provides a robust process for ensuring developments meet sustainability criteria. This checklist is non-statutory, but offers clear benefits.

5.4.3.4. What do we still need to do?

³⁶ Building Research Establishment Environmental Assessment Method

³⁷ The Local Development Framework is a portfolio of documents produced by District Councils that outline the spatial planning strategy for the local area

- Lead by example – encourage the use of **sustainable construction techniques** in newbuild and refurbishment projects
- Foster **awareness raising** among general public, building users and building specifiers, to empower them to become more demanding in the levels of sustainability they expect in new buildings.
- Encourage more **sustainable and energy efficient** construction. New developments represent an opportunity to ensure sustainability is integrated from the beginning through design, materials and building methods.
- Work with the **County's construction sector**, through training and education, to promote sustainable development – including working with regional partnerships to progress this
- Where possible utilise the **planning system** to maximize best practice in sustainable development
- Introduce specific energy policies within the new Joint South Worcestershire Local Development Framework setting out standards for new domestic and commercial developments and a series of Supplementary Planning Documents that minimise the impact of developments on climate change.
- **Disseminate best practice** and **raise awareness** of the exemplar projects which exist in Worcestershire
- Spread **best practice from housing associations** to other providers

Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy:-

Worcestershire's District & County Councils

Developers

All those who commission new buildings

Construction professionals – local architects, surveyors etc.

Colleges of Further Education

Statutory advisors on spatial plans and development documents

5.4.4. Reducing Energy Use and Emissions from Transport

5.4.4.1. Why is this important?

Traffic and pollution levels rose throughout Worcestershire between 2004 and 2006, with a 3 percent increase in the County's annual average traffic mileage. Transport accounts for approximately 28 percent of the total CO₂ emissions for the county. Excluding motorways, transport in the County emits over 1 million tonnes CO₂ every year. Four Air Quality Management Areas have been declared in the county, which have recorded traffic induced nitrogen dioxide levels above acceptable levels set by the EC. The situation is likely to continue to deteriorate, as long as the private car remains the dominant travel choice, even for short journeys.

Levels of car use may be further affected by the proposals for growth in the Regional Spatial Strategy (RSS), which, if not carefully planned, may cause growing car use, increasing congestion and a worsening environmental standard. It will be important to ensure that planning policies are in place to mitigate against this.

Between June 2007 and June 2008 petrol prices rose by 24%. The cost of fuel is volatile and on an increasing trajectory, this lends urgency to the need to reduce fuel use. Using fuel efficient vehicles, promoting "eco driving" techniques and car sharing clubs can reduce fuel use and also contribute to cutting emissions.

Promoting the use of locally produced goods and services supports the local economy and reduces the need for transport, making an important contribution to reducing CO₂ emissions. Organisations need to consider how they can support these objectives through their procurement processes.

There are four key ways to reduce transport emissions; travel less, travel by public transport, drive more efficiently, use more efficient and cleaner vehicles. It has been

estimated³⁸ that if there was just a 2 percent improvement in these measures across the county emissions would be reduced by 38,000 tonnes a year, more than half the target we have been set.

5.4.4.2. What have we already done?

- Published in July 2008 the [Worcestershire Integrated Passenger Transport Strategy \(IPTS\)](#). The strategy sets out a staged process for the development of the passenger transport network so it can provide choice and a realistic alternative to the private car.
- Produced a set of **12 best practice reports** to support the IPTS. These have been assembled using experience drawn from around the UK and elsewhere where private car journeys have been significantly reduced.
- Implemented the Sustainable Travel Town project, branded [Choose How You Move](#) in Worcester City, which has delivered a reduction in single occupancy car use of 12 percent amongst households participating in the project. Travel behaviour research will assess modal shift within the city since 2004 and investigate any changes in public perceptions of travel issues.
- Encouraged the development of both [School and Employer Travel Plans](#), which aim to reduce single occupancy car use. Currently there are 60 employer travel plans with a further 23 in development, and 220 school travel plans with a further 28 in development for 2008/09.
- Promoted the [Worcestershire Car Share database](#). Currently 36 employers are registered on the database, enabling their employees to search for suitable car sharing partners.
- An on-going and extensive **smarter choices programme** – building upon the work of the Sustainable Travel Town, to encourage and support the use of **walking and cycling** infrastructure.
- Worcestershire County Council Driver Training Team has developed an **Eco-Driving Course** which demonstrates simple principles designed to reduce fuel consumption by at least 10 to 15 per cent, reducing costs, CO2 emissions and accidents
- Developed a new integrated [passenger transport website](#) providing greater access to passenger transport information.
- Improved the **availability of passenger transport information** so that it is more accessible through libraries and the Worcestershire Hub to those wishing to choose an alternative to the private car

5.4.4.3 What are we aiming to achieve?

Contribute to the **local delivery** of National Indicator 186 – Reduction of CO2. **This equates to a reduction of at least 21,000 tonnes CO2 from transport by 2011.** This will be achieved through local measures such as:

Reducing the reliance on private car travel and offering a genuine choice of transport options through improvements to walking, cycling and passenger transport infrastructure and services

Reducing the need for transport by encouraging locally produced goods and services and planning policies that reduce the need for travel

Reducing fuel consumption in vehicles by encouraging the use of fuel-efficient driving techniques and the purchase of energy efficient vehicles.

5.4.4.4. What do we still need to do?

- Partnership organisations **to develop green travel plans, procure energy efficient vehicles and promote 'eco-driving' techniques for their staff**
- Continue to **support schools** (the aim is for all schools to develop a travel plan by 2010) **and employers** to produce travel plans and reduce car journeys through mechanisms such as the **Worcestershire Car Share** database
- Deliver the **action plans** set out in existing local transport policies, strategies and plans.
- Develop proposals for a **high quality and accessible bus network** (in line with the Worcestershire Integrated Passenger Transport Strategy), which will protect buses from the effects of traffic congestion, deliver higher quality buses, bus stops, passenger information and provide a higher quality service.
- Work with national and regional partners to implement wide ranging improvements to the local **rail network**, both facilities and services.

³⁸ Low carbon leadership 2008 MEA & EST

- Provide a comprehensive network of **Park & Ride interchanges** (rail and bus), – offering a genuine opportunity for the transfer of trips on the outskirts of Worcester city centre and elsewhere
- An on-going and extensive smarter choices programme – building upon the work of the **sustainable travel town**, and providing the opportunity to **maximise the use of walking and cycling** infrastructure
- Encourage **commercial goods movement by rail & water** - there are a number of national funding grants available to encourage commercial goods movement to transfer to rail and the County Council can work with any company interested in this area
- Encourage **sustainable planning policies** that reduce the need to travel
- Promote the purchase of **locally produced goods and accessible local services**, including through the use of organisations procurement processes
- Support at the local level where relevant the Governments proposals to reduce vehicle fuel use – most of these reductions are expected to come through improvements in technology, greater use of biofuels and the **promotion of smoother driving techniques**
- Improve highway infrastructure and information provision to enable more efficient operation and reduce congestion

Climate Change Pledge Actions



- Develop and implement a staff travel plan
- Operate a low carbon/sustainable purchasing policy e.g. using local suppliers to reduce transport costs and emissions, buying energy efficient products etc.

Air Travel

The fastest rising source of CO₂ in the UK transport sector is air travel³⁹. There are no major airports in Worcestershire, however there is potential to increase education about environmental damage due to air travel. It is interesting to note that if the amount of CO₂ emitted by the population's use of aviation is included in the estimate of total County emissions, this increases the emissions attributable to the actions of people in Worcestershire from 4.8 to 5.4 million tones annually. This is 1 tonne of CO₂ more per person.

5.4.4.5. Key Agencies

Worcestershire Partnership Organisations. The following key agencies will have a key role in delivering this part of the Strategy:

Worcestershire's District & County Councils
 Local Passenger Transport Providers
 Local & National transport campaign groups e.g. Sustrans
 Herefordshire & Worcestershire Chamber of Commerce
 Business Link WM
 Worcestershire Rural Hub
 Statutory advisors on transport plans and programmes

5.4.5. Land Use

³⁹ Commission for Integrated Transport (Transport & Climate Change 2007)

5.4.5.1. Why is this important?

The way that land is used and managed can have an **impact on the level of carbon emitted into the environment, or alternatively "captured"⁴⁰ by the soil or vegetation**, thereby reducing emissions. Different agricultural crops and different types of semi-natural habitats (e.g. woodland, heathland and semi-natural grassland) have differing levels of carbon emissions or carbon retention. Different land-management practices such as cutting or burning of vegetation, or the extent and frequency of flooding will all affect carbon emissions from plants, soils and micro-organisms⁴¹.

Worcestershire is a predominantly agricultural landscape, with sparse and small pockets of semi-natural habitat. The total carbon emissions from different types of land-use can currently only be estimated from a few studies⁴². We know however that **the way that land is used in Worcestershire will change in the future** – so taking account of the way that using and managing land effects carbon emissions will be important – these changes could make a real difference to emission levels. Changing land use (e.g. through development) and harmful management practices (e.g. drainage) caused 14 million tonnes of carbon to be emitted from UK land in 2005.⁴³ The energy used in managing land for its multiple benefits and services could also be used and marshalled much more efficiently.

There is real potential in Worcestershire to encourage **local production of non intensively produced food and to promote the sale of local produce**. This local focus would reduce "food miles", reduce the reliance on imports, help to mitigate some of the impact of intensive livestock farming across the globe on climate change and assist local farmers and producers.

We recognise that **"green infrastructure"** (a planned and managed network of green/open spaces and other environmental features within and between towns and countryside) **can play a role in both climate change mitigation and adaption**. For example, while absorbing and storing carbon from the atmosphere, trees can also increase the floodwater storage capacity of the land and prevent damaging flooding downstream. This is an issue that needs to be considered in future land use planning through the Local Development Frameworks. Such infrastructure can – if strategically sited – enable isolated, vulnerable wildlife populations to connect with others by means of linkages and corridors of wildlife habitat, so boosting their survival and conservation prospects. Without 'landscape scale' enhancement measures which provide these routes and stepping stones much of the county's and its neighbours biodiversity could gradually succumb to the environmental changes caused by intensive land use and climate change.

5.4.5.2. What have we already done?

This issue was not addressed in the original Climate Change Strategy – so it is a **new area of work** for us. We recognise that there is much to do to raise awareness around how land use and land management practices contribute to carbon emissions.

5.4.5.3. What are we aiming to achieve?

Gain a fuller **understanding of how land use** currently contributes to the total emissions of Worcestershire.

Seek to **influence decisions about land-use** and land-use change across the County in a way that helps reduce emissions or locks up carbon.

Raise the **profile of the role of land use** in managing carbon, in particular where this can contribute to a reduction in carbon emissions (e.g. through habitat restoration, or through farm efficiency measures)

Further the strategic planning of Green Infrastructure through Local Development Frameworks and other means, for its multiple benefits

⁴⁰ This known as carbon sequester or sequestration

⁴¹ The Stern Review, Cabinet Office – HM Treasury, 2006

⁴² Baggott, S.L., Cardenas L, Garnett E, Jackson J, Mobbs DC, Murrells T, Passant N, Thomson A, Watterson JD (2007). UK Greenhouse Gas Inventory, 1990 to 2005: Annual Report for Submission under the Framework Convention on Climate Change. AEA Energy & Environment

⁴³ Bellamy, P.H, Loveland, P.J, Bradley, R.I, Lark, R.M & Kirk, G.J.D (2005). Carbon losses from all soils across England and Wales 1978-2003. Nature, 437, 245-248

5.4.5.3. What do we still need to do?

- Share **knowledge and understanding** on this issue as it emerges
- Be innovative in finding **joined up solutions** that enable the contribution of land use to carbon management and climate change adaptation to be fully employed
- Identify key pieces of work that **quantify emissions from different land use types** in Worcestershire, and seek to undertake an analysis that shows areas of risk and opportunity.
- Publish a 'Planning for Soils' research paper to provide guidance for planners on protecting and conserving soils.
- Where possible promote the use of locally produced food suppliers, including through the procurement process
- Promote and encourage people to "grow your own" food where possible
- Worcestershire County Council is developing a "**Planning for Green Infrastructure**" paper which will contribute to reducing emissions as well as adapting to the impacts of climate change

5.4.5.4. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

Natural England
Worcestershire's District & County Councils
The Environment Agency
Severn Trent
FWAG
Worcestershire Wildlife Trust
Worcestershire Biodiversity Partnership
NFU
West Midlands Regional Planning Group
DEFRA
UKCIP
Forestry Commission

5.5 WASTE PREVENTION

5.5.1 Why is this important?

There has been a great deal of activity to reduce the volumes of waste produced and the percentage of waste landfilled in the County since this Strategy was published in 2005. The importance of waste prevention, re-use, composting and recycling have achieved much greater awareness in the public mind⁴⁴. Total levels of household waste produced in Worcestershire have declined and the percentage going to landfill has fallen for household waste from 77 percent in 2004 to 53 percent in 2007/8 and for commercial and industrial waste from 67 percent in 2004 to 55 percent in 2007/8.

This is important as waste adds to the emission of greenhouse gases in three ways;

- When biodegradable waste breaks down in landfill sites it gives off greenhouse gases like methane (65 percent) and carbon dioxide (35 percent). Currently waste contributes approximately 3 percent of County CO₂e emissions.
- Energy is needed to transport, manage and dispose of waste,
- Disposal, rather than reuse, repair or recycling, leads to a need for more raw materials. Generally less energy is needed to make items from recycled materials than from raw materials, (providing the waste collection and treatment processes are not too energy intensive). Waste can be viewed as a useful resource.

5.5.2. What have we already done?

⁴⁴ November 2007 Citizens Panel Survey – of respondents to the question of what are you doing to limit climate change 74 percent are recycling, 31 percent are composting and 7.5 percent reducing waste

- **Campaigns** such as Love Food, Hate Waste and 'Mission Impossible' which promote waste prevention and reuse to households.
- Introduced **kerbside recycling schemes** to households across Worcestershire collecting items such as paper, plastic, cans and glass.
- Planning permission has been granted for a Commingled **Materials Reclamation Facility (CMRF)** to sort mixed recyclables into separate, saleable material streams
- Encouraged **composting** through sale of low cost composting bins, composting clinics and the "Master Composters" scheme
- Encouraged **social enterprises** such as Worcestershire Lifestyles, who are encouraging reuse of resources by collecting and refurbishing items such as furniture and IT equipment. Formed the Social Enterprises involved in Waste and Recycling Forum (SEWAR).
- **Tapped climate change producing gases** such as Methane (23 times more potent greenhouse gas than CO₂) and **used it for fuel** at Throckmorton and Martley landfill sites.

Case Study - Kerbside Recycling

Following the successful introduction by District Councils of kerbside recycling schemes, County residents are being encouraged to prevent waste in the first place. Campaigns such as 'Love Food, Hate Waste' have been launched to encourage residents to reduce food waste by using up leftovers and using food items before they go out of date. The next planned improvement to the recycling service is the introduction of more materials which can be recycled through the kerbside recycling schemes provided by the district councils in Worcestershire.



5.5.3. What are we aiming to achieve

Contribute to the **local delivery** of National Indicator 186 – Reduction of CO₂ – the **target is 1.9 percent local reduction in CO₂ emissions from 2005 levels by 2011.**

Worcestershire Partnership has also signed up to a target in the **Local Area Agreement** to reduce the amount of municipal waste going to landfill. Worcestershire County Council and the constituent Waste Collection Authorities are aiming to **reduce the amount of household waste going to landfill to at least 22 percent of total amount produced by 2015.**

The National Waste Strategy 2007 sets a target of **reducing the amount of industrial & commercial waste going to landfill** to 80 percent of 2004 level by 2015

The Regional Spatial Strategy (Preferred Options Consultation, Dec 2007) sets targets for the volumes of waste that need to be diverted from landfill to achieve national targets by 2026.

5.5.4. What do we still need to do?

- Continue to **raise awareness of waste prevention, reuse, composting & recycling** with businesses, schools, public organisations, community groups and householders through campaigns such as "Love Food Hate Waste"
- Continue to raise awareness of the **links between climate change and waste**
- Ensure that the revised **Joint Municipal Waste Management Strategy for Herefordshire and Worcestershire**⁴⁵ addresses climate change. One of its aims is to reduce the amount of household waste produced in the County
- Ensure that the **Waste Core Strategy** (which needs to be completed by 2012) addresses climate change. The Strategy will set targets and planning policies to enable the development of waste management facilities for all waste streams (including commercial and industrial waste) in the County up to 2027
- Support the **development of new waste management facilities** in the County

⁴⁵ Managing Waste for a Brighter Future, Joint Municipal Waste Strategy for Herefordshire and Worcestershire 2004 – 2034, Nov 2004

- Promote **small scale diversification and business development projects** in the countryside, including grant aiding proposals for bio and renewable energy installations and recycling/waste equipment (in partnership with the Rural Development Agency and Herefordshire Council)
- Continue to explore the potential of **tapping methane as fuel** at further landfill sites in the County
- Develop the potential of **utilising waste products to create a localised energy supply** e.g. wood waste, biodigestion/biogas

Climate Change Pledge Action



Minimise our waste production and recycle as much as possible

5.5.5 Key Agencies

Worcestershire Partnership Organisations. The following key agencies will have a key role in delivering this part of the Strategy:

Worcestershire's District & County Councils
 Severn Waste Services
 Worcestershire Rural Hub
 Worcester College of Technology
 The Environment Agency
 Herefordshire & Worcestershire Chamber of Commerce
 Herefordshire & Worcestershire Business Link
 Joint Herefordshire and Worcestershire Members Waste Management Forum
 Joint Herefordshire and Worcestershire Officers Waste Management Forum
 Herefordshire Council
 Environment Agency
 DEFRA
 Organisations and businesses within the waste management industry
 Waste and Resources Action Programme
 Social Enterprises involved in Waste and Recycling (SEWAR) Forum

5.6 INCREASING RENEWABLE ENERGY

5.6.1. Why is this important?

"The problem of climate change means we must look to carbon-free technologies to meet our energy needs" - Sir David King, UK Government's Chief Scientist, writing in the New Scientist (April 2004)

Promoting energy conservation and efficiency by minimising wastage will be the key action that will reduce Worcestershire's CO₂ emissions. However once these primary concerns have been addressed consideration can be given to generating energy from **renewable energy sources**, (such as wind, water, solar, & biomass⁴⁶) as an alternative to the burning of fossil fuels, which can achieve reductions in the amount of carbon dioxide produced in the county.

The potential energy resource from renewable technologies in Worcestershire could make a contribution to reducing carbon emissions from fossil fuels. In reality the development of this resource will be limited to **projects that are economically viable and environmentally acceptable**, and which gain the necessary development consents. There is currently a **gap between targets set for renewable energy and achievement at every level** – national, regionally and locally in Worcestershire.

With increasing fossil fuel costs there is evidence that a significant number of Worcestershire residents are already looking to alternative sources of energy. The **November 2007 Citizen's Panel indicates that woodfuel is a significant heating source**⁴⁷ (in fact demand for woodfuel

⁴⁶ Biomass is the biodegradable fraction of products, waste and residues from agriculture (including plant and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. (Planning Policy Statement 22, ODPM (now DCLG) 2004)

⁴⁷ The November 2007 Citizens Panel Survey showed 10% of respondents (approximately 100 respondents) using woodfuel

stoves appears to be currently outstripping supply in Worcestershire) and **approximately 1 percent of respondents using solar heated hot water systems**. The pressure for development in Worcestershire of new homes and businesses will increase demands for renewable energy sources, for example the Code for Sustainable Homes requires that **all new homes are carbon neutral**. The appropriate infrastructure is required to enable renewable energy sources to make a contribution to this.

5.6.2. What have we already done?

- Produced a '**Planning for Renewable Energy in Worcestershire**' research paper that draws together key information needed to understand the planning issues surrounding the development of small and large-scale renewables in Worcestershire.
- Commissioned an **independent study** to provide an objective assessment of the realistic capacity of the County to generate renewable energy at the larger scale.
- Installed a **wood fuelled boiler** at County Hall – the County Council “headquarters” in Worcestershire and installing wood fuel in a growing number of County Council properties, such as schools and countryside centres.
- The County Council and Wyre Forest District Council use **“green” tariff electricity** to power their buildings
- Small scale **ground source heat** is now being used used at Malvern Hills Science Park , the Duckworth Trust Pump House Centre and Red Hill School, Worcester
- Small scale **solar water heating and wind power** is being used at the Arrow Valley Countryside Centre in Redditch and other small developments around the County
- Redditch Cooperative Housing Association has installed **electrical solar panels** on some of their properties, and have plans to install **solar water heating** in an upcoming development
- Some Worcestershire organizations and householders have already taken advantage of grants for renewable energy systems available from the Low Carbon Buildings Programme e.g. Elmley Castle Village Hall.
- Some Worcestershire district councils are providing top up grants to householders wishing to install renewable energy systems. (These are intended to complement the existing Low Carbon Building Programme)

5.6.3. What are we aiming to achieve?

To increase the proportion of energy used in the County that is generated from renewable sources.

The physical nature of the County dictates which renewable energy technologies are suitable for energy generation. As a land bound, generally low lying County, the potential for development is limited to technologies that use biomass, solar energy, running water, wind, and ground source heat. We recognise that the greatest carbon savings will be achieved through a **mix of appropriate technologies, at a mix of scales**. Relying on one particular type of facility will not be enough.

An independent study* into the County's renewable heat and power resources indicates that Worcestershire could realistically aim to source 3.5% of its energy from *larger-scale* biomass, wind & hydro energy generation by 2026. To add valuable capacity there is a need to increase the take-up of smaller scale energy generation from all renewable sources i.e. systems providing energy for single or a small number of properties or processes.

** Renewable Energy Study for Worcestershire County - Final Report - November 2008 - IT Power*

5.6.4. What do we still need to do?

- Worcestershire Partnership organisations to consider other ways in which they can **support the development of renewable energy** (e.g. by identifying sites they own suitable for renewable energy developments)
- Develop a **plan for increasing take up of renewable energy** in the County
- Raise awareness of the potential of renewable energies based on **accurate and realistic information** aimed at the public and to decision makers in public and private organisations. We will do this through supporting initiatives such as the RE:Think energy programme aimed at businesses and through the provision of advice on renewable energy to householders through Act on Energy.

- Continue to raise awareness of the **grants** that are currently available to help towards the cost of renewable energy systems, for example, the Government's national "Low Carbon Buildings Programme" grant scheme offers 50 percent grants to householders and non-profit making organisations wishing to use renewable energy. Local authorities may also be able to help householders with the costs of installing microrenewables. Grants are also available from DEFRA to farmers wishing to grow bio fuel crops such as miscanthus grass & short rotation coppice.
- Promote the use of renewable energy to the County's **home owners (particularly those off the gas network)**
- Encourage **development of renewable energy technologies** in the appropriate environment
- Disseminate lessons from **Wyre Forest Woodfuel Pathfinder** – a national woodfuel pilot project seeking to develop the woodfuel industry in the Wyre Forest area
- Support the **regional drive** to support innovation in environmental technologies, and promotion of low carbon technologies in the region, including encouraging **collaboration and innovation in environmental technologies** in Worcestershire and linking of companies here to new environmental markets
- Transfer **biomass expertise** developed by Worcestershire County Council to other organisations in the County
- Ensure specific **policies and guidance** on the exploitation of renewable energy resources are included in all strategic and local development plans.
- **Consider the potential of organic waste to generate renewable energy.**
- **Support small scale projects**, which help develop the local economy and which are valuable in raising awareness at a local scale. An example would be the proposed development of two low carbon communities in Bewdley where the take up of woodfuel for heat and other renewable technologies will be encouraged, as well as changes to lifestyle and transport, through the 'Grow with Wyre' project.
- Consider the **development of a high profile** 'renewables demonstration park' as part of an environmental technologies cluster
- **Improve the understanding** of renewable technologies impact on the wider environment, in particular biodiversity, and ensure that increasing renewable energy use is sustainable, for example through sustainable management of woodlands for woodfuel stoves and boilers.

Climate Change Pledge Action



Use renewable energy, through procurement (e.g. green energy tariff) and/or generation e.g. solar thermal, wood fuel, ground source heat etc.)

5.6.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

Worcestershire's District & County Councils
 District Local Strategic Partnerships
 Act on Energy
 Worcestershire Rural Hub Biomass groups
 Welcome to Our Future
 Bewdley Development Trust
 Heartwoods
 Wood Energy Task Group
 Forestry Commission
 Marches Wood Energy Network
 DEFRA
 nPower
 GOWM
 Worcestershire Home Energy Group
 Housing Associations
 Advantage West Midlands
 Wyre Forest Woodfuel Energy Task Group
 Worcestershire Biodiversity Partnership

6. PLAN AND ADAPT TO THE IMPACTS OF CLIMATE CHANGE

6.1 Why Is This Important?

Carbon Dioxide, methane and other 'greenhouse' gases stay in the atmosphere for a long time, (CO₂ can stay for up to 200 years). This means that whatever we do to reduce emissions we cannot escape some change in the climate. We can only hope to **reduce the severity of the change**.

While climate change has had some benefits and is presenting some opportunities; for example an increase in growing season (one month over the last century), warmer winters (reducing the need to heat homes), it is the **negative impacts of climate change** that will have a much greater effect if nothing is done about them. The impact of climate change therefore needs to be built in alongside other issues in many aspects of decision-making by public organisations and by many businesses.

Whilst no one incidence of extreme weather can be directly attributed to climate change an increasing incidence and severity of extreme weather is consistent with scientist's predictions of climate change. The cost of extreme weather events to Worcestershire has already run into millions. The **floods** of summer 2007 cost the county an estimated **£150 million** in terms of loss to businesses.

According to the November 2007 Citizen's Panel **60 percent of respondents believe that many of the impacts of climate change are already being felt in the County** and where this is not already the case that they will do so in the future.

As a consequence, across the county, public authorities, businesses and householders have already had to take **adaptive action**, for example;

- Work to improve the drainage capacity on Worcestershire's roads
- Putting in place emergency procedures for more extreme storm and floods
- Balancing the books for increases in building insurance premiums
- Planning to optimise water resources

6.2 The Impact Of Climate Change On Worcestershire

Research into the impacts of climate change on the UK is being undertaken by many agencies. The **UK Climate Impact Programme, (UKCIP)** works to disseminate this information and, with the Environment Agency, helps to advise organisations on how to ensure assets and services are resilient to the impacts of climate change.

Updated information on the predicted changes in the climatic system (UKCIP 08) should be released in early 2009, and will include information on probabilities of future climate scenarios and identify possible changes at a localised level. Information derived from UKCIP02 has been used in this strategy.⁴⁸

A study on the impacts of climate change for the West Midlands region has also been completed and a **regional Climate Change Adaptation Partnership** has been established concentrating on spreading good practice in the built environment, local government and rural sectors.

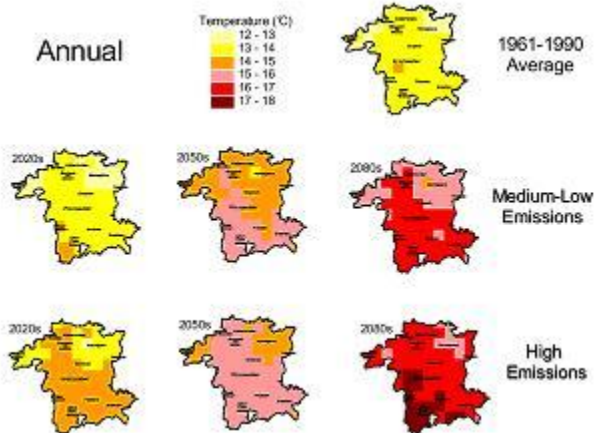
According to **research into the impact of climate change on Worcestershire**⁴⁹ it is highly likely Worcestershire will see further:

- Increased rainfall intensity
- Greater flooding
- More frequent extreme weather events e.g. heatwaves and storms
- Warmer winters
- Hotter summers
- More summer drought
- Increasing threats to property, wildlife and air quality
- Increases in average temperatures (by up to 1.3°C by 2020s and up to 4.5°C by 2080s).

⁴⁸ The Impact of Climate Change in Worcestershire – G Cavan 2004

The maps below illustrate predicted climate change in Worcestershire. They compare predicted changes under two different future global scenarios; high emissions, (business as usual; CO₂ emissions rising at current rate), and medium-low emissions, (where technological change, medium levels of population & GDP growth and resultant energy demand has helped to reduce CO₂ emissions) to the 1961-1990 average conditions.'

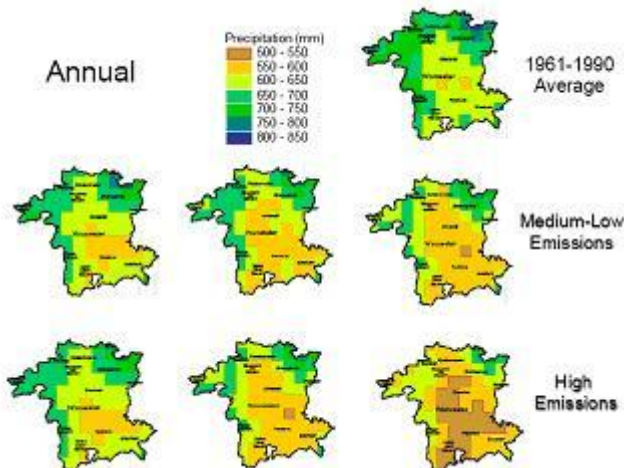
Figure Seven - Predicted Temperature Changes in Worcestershire



The above image highlights the predicted changes in maximum (summer) temperature under the two different global CO₂ emissions scenarios up until 2080s for Worcestershire. It shows a baseline average summer temperature for the majority of the county of between 19.5 and 21C. By the 2050s under a high emissions scenario this summer temperature is forecast to rise to between 24 and 25.5C (5.5c above average) for the south of Worcestershire and between 22.5 and 24C (3C above average) for the north. The images show the South of Worcestershire to have the fastest temperature rise.

Under a high emissions scenario, i.e. if emissions continue to rise at the current rate, the majority of Worcestershire is predicted to see a winter temperature increase of 1-2C with areas such as Malvern and Upton-upon-Severn expected to see rises of 3-4C by the 2050s.

Figure Eight - Predicted Precipitation Changes in Worcestershire



The above images highlight the predicted changes in average annual precipitation from the baseline average under varying emissions scenarios. Under both emissions scenarios, annual rainfall is shown to decrease across the County with areas such as the Vale of Evesham seeing drops of between 50 and 100mm by 2050s under high emissions scenarios. This combined with higher temperatures will ultimately significantly reduce soil moisture content. Underlying data shows an increase in average winter rainfall accompanied by a larger decrease in average summer rainfall.

The maps below show areas identified as particularly at risk from the climate change impact in terms of subsidence, flood and outdoor fire

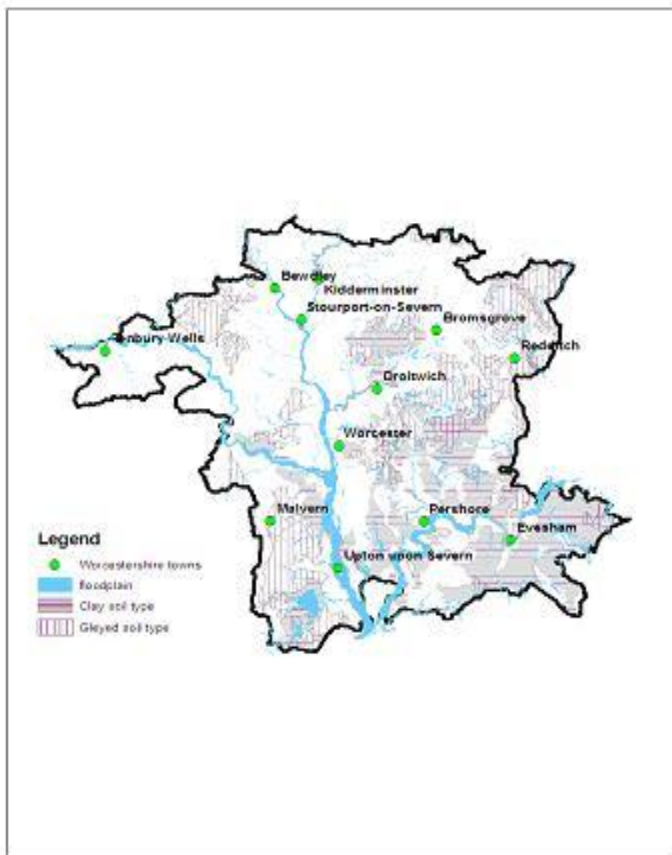
Figure Nine - Subsidence Risk according to soil type



Subsidence risk to buildings and infrastructure is highlighted in the above figure. The areas at higher risk of subsidence are attributed to soil types that expand and contract depending on water content. Evesham with a predominantly clay soil and areas between Upton on Severn and Greater Malvern with a gleyed soil are two of the areas shown as having a greater risk of subsidence in the county.

Other natural hazards which will need to be considered are soil erosion risk, soils at risk of change or landslip risk.

Figure Ten - Flood Risk

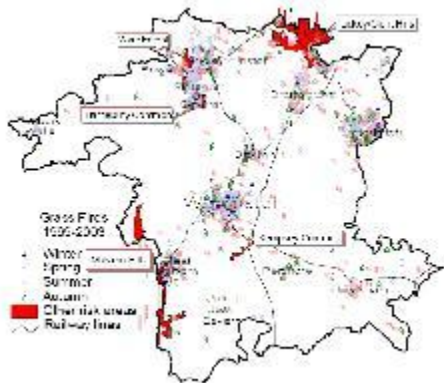


The above image outlines the areas at risk from river flooding. This is accompanied by the location of clay and gley soil types through which water flows through slowly and which are therefore more at risk of flash flooding as a result of intense rainfall. The flood risk determines the probability of a river flood in a particular location during a year. The majority of flood risk is classified as 1 in 100 year flood event meaning there is a 1% chance of that size of flood occurring in any given year. Currently 4862 households in Worcestershire are in areas at risk of flooding from a 1 in 100 year flood and 10254 households are at risk of a 1 in 1000 year flood. 4113 households & businesses

were severely affect by flooding in 2007. It is predicted that the risk of flooding will increase 4 – 6 times over present levels by 2080.⁵¹

51 be aware, be prepared, take action – LGA May 2008

Figure Eleven - Outdoor Fire Risk



This image highlights areas at risk of grass fires. It shows incidences of grass fires between 1999 and 2003. The main concentrations of grass fires in all seasons are around urban centres. Large areas of heath lands are also particularly vulnerable such as the Malvern Hills and the Lickey/Clent Hills.

A report into the effects of Climate Change on UK Fire and Rescue Services calculated that a 1% average summer temperature rise is likely to lead to an increase in the number of fires by 17 – 28% and a 3% rise would lead to a 34 – 56% increase⁵⁰.

6.3 Adapting To Climate Change In Worcestershire

The Worcestershire Partnership wants to encourage all organisations and individuals identified as vulnerable to climate change to assess the risk and have adaptation measures in place.

The task is to **ensure** that:

- A watching brief is kept on **emerging research** on Climate Change impact and adaptation
- Organisations have **access to the information** on the impacts of climate change,
- Key **policies, strategies and plans** take account of the impact of climate change (are made “**climate resilient**”)
- **Skills are developed in areas such climate risk assessment**. Action needs to be taken within organisations now and it is only by developing the skills of the workforce that real progress can be made.

Research has been carried out within the following sectors identifying areas most likely to be profoundly affected by Climate Change and where partners have the power to take adaptive action

- **Public Services**
- **Industry & Commerce**
- **The Built Environment**
- **The Natural Environment**

The rest of this section deals with each of these areas in more detail.

6.3.1. Public Services

6.3.1.1. Why is this important?

Public services are those that the public looks to for **help and leadership** in extreme weather. They are already feeling the impact of climate change. The cost to Worcestershire County Council of the 2007 summer floods was £9million to repair severely damaged roads and buildings and affected

⁵⁰ CLG:Effects of Climate Change on Fire and Rescue Services in the UK (Fire Research Technical Report 1/2006), December 2006

District Councils incurred gross costs of almost £3million⁵¹. The flooding also severely disrupted services - for example schools and care homes were forced to close. It is crucial public services adapt appropriately to enable **continued functioning of the County** as the climate changes and in extreme weather conditions.

Apart from responding to emergencies, public services have the potential to address a wide range of climate change impacts through functions such as health, transport, planning and building control, community care, waste, housing, environmental health and trading standards services. Public services have a particular responsibility to more vulnerable communities in terms of addressing climate change impact- all communities are at risk, but poorer communities are likely to suffer disproportionately.

6.3.1.2. What have we already done?

- Led by example – the Partnership led the recovery response to the **2007 floods**, this partnership approach was recognised as good practice nationally
- The Local Resilience Forum has established the **Severe Weather Group for Worcestershire**, which will manage emergency response to extreme weather events e.g. multi agency flood plans
- Established the **County Drainage Group** bringing key organisations and interested parties together to solve drainage problems across the county
- Factored future climate change into **design of new public buildings** e.g. Red Hill School, Worcester
- Published a **Planning for Climate Change in Worcestershire Research Paper**⁵² to inform new development in the county in particular through local development frameworks – the paper includes information on climate change impact and adaptation
- The PCT have produced an overarching **plan for dealing with extreme heat**. This has been translated by the appropriate agency to their particular settings for example schools and social care settings
- Worcestershire County Council has created a **local climate impacts profile (LCLIP)** outlining the impact that recent severe weather events have had on the County Council (& some other Worcestershire Partnership organisations) for use in adaptation planning across the Council
- Worcestershire County Council Highways Department have adapted their drain management regime to take account of those areas most prone to flood events
- The Environment Agency and Met Office have collaborated effectively to provide timely information on how severe rainfall events will impact on local areas
- The Environment Agency has introduced "**Flood Warning Direct**" (0845 988 1188) whereby people in areas at high risk of flooding can receive a warning via telephone, text fax or paper
- Worcestershire County Council has achieved Beacon Council status for Climate Change including for its work on climate change adaptation.

Case Study - 'Mini Hubs' (Hublets) – A Multi Agency Response.

Following the devastation caused by the Summer Floods 2007 it was quickly evident that recovery from the floods was required to commence immediately. The remit included a clean-up operation involving restoration of the county's road network, drainage and watercourses and community reassurance to address key areas of humanitarian relief.

A multi-agency approach was adopted, using temporary Worcestershire Hub inspired "hublet" centres in the hardest hit areas of the county (Upton-upon-Severn, Tenbury Wells, Sedgeberrow, Kemerton, Powick and Kempsey) to reach out to residents with information, advice and support. Staffed by County and District council staff, West Mercia Police, Utility Companies and Worcestershire PCT the centres took on a real multi agency dimension with all services operating to the same agenda for those residents in need, getting them the advice and guidance they required, whilst also getting an 'on the ground' presence to demonstrate support for the residents. This approach has now been adopted as a 'best practice' example of the way to assist in the early stages of recovery and get out to the people in most need, during any emergency.

6.3.1.3. What are we aiming to achieve?

As part of the Local Area Agreement the Worcestershire Partnership has agreed the inclusion of **National indicator 188**. This indicator is designed to ensure that local authorities are sufficiently prepared to manage risks to service delivery, the public, local communities, local infrastructure, businesses and the natural environment from a changing climate, and to make the most of new opportunities. The indicator measures progress on assessing and managing climate risks and

⁵¹ Gross costs of £2,933,347 incurred by Worcester City, Wychavon and Malvern Hills District Councils. Some of these costs were recouped via grants from central government or insurance claims

⁵² Paper produced by Worcestershire County Council, August 2008

opportunities, and incorporating appropriate action into local authority and partners' strategic planning. The indicator describes the sorts of activities that councils will have taken at each of levels 0 - 4 (there is more information on this in Appendix 3). The higher the number the greater the level of preparedness. In Worcestershire the **County Council will reach level 3 and district councils will reach level 2 of this indicator by 2011.**

The LAA also contains a local indicator relating to flooding - to **reduce the risk of flooding (both fluvial and pluvial)** throughout the county. This highlights the importance given to this issue in Worcestershire

6.3.1.4. What do we still need to do?

- Ensure all public services in Worcestershire **identify and assess the risk** from climate change to their local area and services and act accordingly by taking the following measures:-
- Raise **awareness** within all public services of:
 - The impacts of climate change on local area and public services
 - The work of the UK Climate Impacts Programme and Environment Agency, and how they can help public services plan for changes in climate – for example Wychavon District Council, Redditch Borough Council, Bromsgrove District Council and Wyre Forest District Council will all be producing a Local Climate Impacts profile
- Encourage all public services to factor in climate change when undertaking **risk assessments** and developing **business continuity plans**
- Ensure current **policies, strategies & plans** include provision for the impacts of climate change particularly in the following areas;
 - Emergency Planning
 - Health
 - Transport & Highways
 - Drainage & Sewerage
 - Power & water supply
 - Housing & Building Management
 - Open space management
 - Waste Services
 - Land Use Planning
 - Economic Planning
- Prepare **Multi Agency Flood Plans** for each District in the county. These will define the more locally based actions and activities to be undertaken by each partner agency
- Implement the findings of the **Pitt Review 2008** on lessons learned from the 2007 floods
- Ensure **emergency services** are adequately prepared to deal with the impacts of extreme weather
- Develop our strategy towards encouraging businesses to put in place **business continuity** arrangements

Climate Change Pledge Action



Carry out an assessment of likely impacts of climate change on our organisation and put in place plans to address them

Case Study – Assessing the risks posed by Climate Change

Hereford and Worcester Fire and Rescue Service have considered the risks and implications for the Service of differing Climate Change scenarios. They have considered how higher summer temperatures, drought, storm or floods scenarios would impact upon them – in terms of the initial emergency response and recovery but also damage limitation and return to normality. The assessment considers the resource implications, need for specialist services and equipment and also the potential changes in the role of the service that may be required.

Key Agencies

All members of the Worcestershire Partnership.

The following agencies will have a key role in delivering this part of the Strategy: -

Worcestershire's Parish, District & County Councils
District Local Strategic Partnerships
NHS Trusts
West Mercia Police

Hereford and Worcester Fire & Rescue Service
The Environment Agency
Utilities
The Met Office
National Flood Forum
DEFRA
UKCIP

6.3.2. The Business Sector

6.3.2.1. Why is this important?

Climate change will affect all businesses in all sectors. The impact will vary depending on the nature of the business and the relationships they have with their customers and supply chain.

While changes in the climate will cause some significant problems for some businesses, there are opportunities that can be good for many businesses as well. Planned and coordinated action by businesses working with their partners in both the public and private sectors will help to minimise the negative impact of the changes and maximise the opportunities that are presented.

A recent survey carried out by Chambers of Commerce across the country on a national sample of 3,000 businesses showed:

- Half of respondents stated that climate change was a significant issue for their business though more thought it would become an issue over the next five years.

Businesses of all types need to understand how the changes in the climate will affect their business and then adapt what they do to meet the new situation.

6.3.2.2. What have we done so far?

- Organised **events to raise awareness** of climate change issues among businesses of all sizes in the County. These events have encouraged businesses to use UKCIP tools to identify risk and adaptive measures
- Organised events for businesses to encourage and promote **business continuity planning**
- Published in the Chamber of Commerce **newspaper and e-newsletters** on climate change
- Secured **£725,00** from the £1 million available from Advantage West Midlands to **implement our recovery plan from the flooding** in Summer 2007
- **Researched** the potential impacts of climate change on the **Vale of Evesham**. The study looked at the impact of the drought in 2003 on agricultural production. The results of the research were publicised to local businesses so that they were able to learn lessons for the future.

Case Study - Severn Valley Railway

Advantage West Midlands provided £750,000 to aid the necessary repair works to get the Severn Valley Railway up and running again after flooding in June and July 2007. These works involved putting systems in place to reduce the extent of damage in the future. AWM also provided an extra £5000 for the marketing and promotion of events when service was resumed on the railway.

6.3.2.3. What are we aiming to achieve?

Change business attitudes to recognise and understand the threats and opportunities presented by climate change and the need to adapt to climate change for the future

6.3.2.4. What do we still need to do?

- Encourage Worcestershire businesses to **assess their sensitivity to climate change**, and to factor climate change into their plans, including business continuity arrangements
- **Raise awareness** within the business community of
 - the impacts of climate change on business
 - the work of the **UK Climate Impacts Programme**, and how they can help businesses to plan for changes in climate
- Encourage businesses to adopt the **principles of risk management** when considering the best way to take adaptive action to find where possible, "no regret" options i.e. flexible options which have multiple benefits
- Encourage businesses to **exploit the opportunities of climate change** e.g. new markets or products

- Develop the **skills of the workforce** so that they are well placed to meet the challenge of climate change
- Work with strategic planners to ensure that where possible **employment land** is located away from floodplains
- Identify businesses in Worcestershire **most sensitive to the impacts** of climate change and work with them to help them take adaptive action
- Explore the potential to include climate change as an issue in **established business training courses**

6.3.2.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy:-

Worcestershire's District & County Councils
 Herefordshire & Worcestershire Chamber of Commerce
 Business Link
 Federation of Small Businesses
 Welcome to Our Future
 West Mercia Supplies
 Marches Energy Agency
 Worcestershire Ambassadors
 University of Worcester
 Worcester College of Technology
 Natural England

6.3.3. The Built Environment

6.3.3.1. Why is this important?

Current indications suggest that 36,600 new homes need to be built in Worcestershire between 2006 and 2026, together with significant new commercial & industrial buildings.⁵³ **Climate change is influencing the way our buildings are designed and constructed.** New ways of building are being developed to cope with the increased heat and rainfall to which our buildings are being exposed.

Whilst the planning system and building control can influence the ways in which new buildings are constructed, perhaps the greatest challenge lies in making our existing buildings 'climate resilient'. At least **80 percent of the current housing stock will still be standing in 2050⁵⁴**, and this represents a huge agenda. There are limited statutory powers to influence the retrofitting of buildings, but providing homes and businesses with advice and providing information on grant schemes could be valuable in ensuring the **existing built stock adapts to future conditions.** Historic buildings can be especially vulnerable to the effects of climate change, and liaison with conservation officers is encouraged to ensure workable solutions can be found.

In seeking to adapt existing properties to the impacts of climate change **care needs to be taken to avoid an unintended consequence of increasing emission levels.** For example as temperatures rise a potential response could be to install an air conditioning system – thus increasing the amount of energy consumed and CO₂ released. This demonstrates that adaption measures need to be considered in terms of their wider mitigation impacts as well.

6.3.3.2. What have we already done?

- Led the way nationally in the **development of sustainable climate-resilient construction**
- Shared examples of this work with others, including through Worcestershire County Councils Beacon Award status
- District Councils are encouraging sustainable construction through their **Local Development Frameworks**, and this will be crucial in ensuring new buildings are able to cope with future weather events

⁵³ West Midlands Regional Spatial Strategy Phase Two Revision Draft - Preferred Option, December 2007, WMRA

⁵⁴ Sustainable Development commission, 2008

- Awareness raising through events and seminars, such as the **Partnership's Climate Change Conference**, offer the opportunity to communicate the importance of adaptation to a wider audience

Case Study - Red Hill School Worcester

The new development of Red Hill School was opened in the weeks leading up to the July flooding in 2007. The building was specially designed with climate change predictions in mind to make the site resilient to future climate. The development included a Sustainable Urban Drainage system that allows for the storage of excess water that can be released back into the surrounding environment when water levels start to drop. Other measures such as a grass sedum roof and rainwater harvesting systems all slow down and reduce rainfall run off from the building. The site had previously been prone to flooding but during the July flooding in 2007 the only damage received was to the tarmac surrounding storm drains where they had been overwhelmed.

6.3.3.3. What are we aiming to achieve?

We want to see new development designed and built to cope with the current and predicted effects of climate change. We want to maximise the opportunities presented by refurbishment and alteration to enable existing buildings to take account of the impacts of climate change.

6.3.3.4. What do we still need to do?

- **Raise awareness** of the need for climate resilient construction
- Raise awareness of the steps that **householders** can take to protect their property from the impacts of flooding
- Promote the **exemplars of best practice** that exist in Worcestershire to demonstrate how this can be achieved
- Promote the inclusion of the issue of climate change in **training for built environment professionals** (e.g. architects) including through liaison with regional bodies
- Investigate the opportunities for incorporating mandatory **climate change impact assessment** at the design stage, for new developments in the County
- Establish a dialogue with **heritage organisations** e.g. National Trust to use their adaptation expertise as an educational resource
- Avoid **future development** on the flood plain

6.3.3.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy:-

Worcestershire's District & County Councils
 Developers
 Construction professionals – local architects, surveyors etc.
 Colleges of Further Education
 Environment Agency

6.3.4. The Natural Environment

6.3.4.1. Why is this important?

Worcestershire's natural environment is important to our residents⁵⁵, but its **quality is vulnerable** to the impacts of climate change. We have already seen significant changes in the **timing** of plants and trees flowering, insects emerging and migrant birds arriving (www.phenology.org.uk). If action is not taken in time, **plants, animals, habitats and natural features** we associate with Worcestershire may disappear as they become unable to adapt to the changes in the natural environment. The loss of such plants and animals would not only be an issue in itself but also could result in the breakdown of natural functions that provide services to the people of Worcestershire, such as pollination and the slowing down of flood waters by wetland habitats, with grave consequences for the quality of life of future generations.

⁵⁵ This is a consistent message from Worcestershire's Citizens Panel Surveys – see 2003 and 2005 surveys

We also recognise the contribution that "Green Infrastructure" can make to adapting to climate change. This issue is further explained in 5.4.5.

6.3.4.2. What have we done already?

- Developed **county landscape assessment maps** to enable us to chart the impacts of climate change on landscapes over time and respond strategically
- Developed a comprehensive habitat **inventory** to help us chart the impacts of climate change on priority **Biodiversity Action Plan**⁵⁶ habitats and respond strategically
- Climate change is flagged up as a current factor affecting many of the habitats and species in the Biodiversity Action Plan for Worcestershire, and many of the vision statements for each habitat and species state the need for improved ecological connectivity to help wildlife adapt to the pressures arising from climate change
- The Regional Biodiversity Partnership has produced a document called "Biodiversity and adaptation to climate change – an advice note for local authorities"

Case Study - Biodiversity

Summer flooding in 2007 resulted in a range of impacts on Worcestershire's biodiversity. Many ground nesting birds lost egg clutches as a result of flooding, such as Curlew and Lapwing, with likely consequences for population declines. Along the River Severn water levels stayed high for 2-3 weeks leaving fields starved of oxygen and sunlight including species rich permanent pastures, with negative effects on their ecology and diversity of uncertain duration.

Adaptive measures have been taken in the form of wetland habitat enhancement. In Worcestershire, Buryend Farm located on the River Severn floodplain agreed to revert arable fields to grass land to enhance biodiversity. Water levels are also now controlled through a system of sluice gates and five ponds have been restored to further enhance the local biodiversity (Wetlands Partnership, 2006).

Pershore Meadows located on the edge of Pershore has been targeted to develop a community wetland which aims to enhance the biodiversity of the site by creating/restoring wetland habitats, reduce Pershore's contribution to flooding, improve water quality in the River Avon, promote wetlands restoration to a wider audience and give local communities an opportunity to learn about wetlands and get involved in wetland management.

6.3.4.3. What are we aiming to achieve?

Encourage and empower those involved in **policy making and management for the natural environment** to take the impact of climate change into account.

Gain a better **understanding** of how current strategies will need to be changed, or modified in light of probable impacts of climate change on the natural environment, and look at **realistic measures** that can be taken to assist adaptation, particularly in the following areas:

- Agriculture
- Open Space Management
- Water Management
- Delivering high quality landscapes rich in natural assets
- Protect functional habitats and develop ecological connectivity

6.3.4.4. What do we still need to do?

- Raising awareness of the impact of climate change and possible adaptation responses by;
 - Developing & promoting **best practice demonstration projects**
 - Encouraging and enabling advisory organisations working in the County, such as the Farming & Wildlife Advisory Group, (FWAG), to give **advice on climate change impact and adaptation** responses
- Ensuring current **policies, strategies & plans** include provision for the impacts of climate change.
- Supporting the continuation of current **biodiversity action plans** to ensure continuing progress on nature conservation priorities in Worcestershire.
- Support the development of strategic **wildlife opportunity maps** and the **Wildlife Habitat Inventory** that further define areas where species and habitats can flourish and expand in range under climate change.

⁵⁶ The Biodiversity Action Plan consists of a series of Species and Habitat Action Plans; including targets for their protection and enhancement

- Produce a **Geodiversity Action Plan** for Worcestershire in order to conserve and enhance the landscapes and materials that make up the county
- Target **environmental land management schemes** in places that contribute to climate change adaptation
- Raising issues that relate to the natural environment (e.g. land for energy crops and local reservoirs) and climate change so they can be **integrated into local and regional plans** e.g. Regional Planning Guidance
- Worcestershire Wildlife Trust (WWT) is running a **Flagship Reserves Programme** – using 9 of their largest reserves to act as a template for climate change adaptation and landscape scale delivery of biodiversity targets (the Living Landscapes approach)– the projects will develop, apply and demonstrate best practice
- Support initiatives such as the WWT **Living Landscapes Programme** within the Forest of Feckenham (FOF) and the Avon Vale - these programmes will involve using a wide range of measures to deliver landscape scale environmental benefits
- Develop and deliver **on the ground biodiversity projects** which help our natural systems adapt to climate change, for example through enhancing ecological connectivity
- Worcestershire County Council is developing a "**Planning for Green Infrastructure**" paper which will contribute to our reducing emissions as well as adapting to the impacts of climate change

6.3.4.5. Key Agencies

All members of the Worcestershire Partnership. The following agencies will have a key role in delivering this part of the Strategy: -

Natural England
 Worcestershire's District & County Councils
 The Environment Agency
 Severn Trent
 Farming and Wildlife Advisory Group
 Worcestershire Wildlife Trust
 Worcestershire Biodiversity Partnership
 National Farmers Union
 West Midlands Regional Planning Group
 DEFRA
 UKCIP
 Forestry Commission
 British Waterways
 Worcestershire Wildlife Trust
 Worcestershire Earth Heritage Trust
 Cotswold Conservation Board
 Malvern Hills Conservators
 Malvern Hills AONB
 National Trust
 British Geological Survey
 Abberley and Malvern Hills Geopark
 West Midlands Safari Park

7. DELIVERING THE WORCESTERSHIRE CLIMATE CHANGE STRATEGY

7.1 The Worcestershire Partnership and Strategy Delivery Mechanisms

The **Worcestershire Partnership** has adopted this review of the Climate Change Strategy. The responsibility for delivery is shared by the **Climate Change Task Group** and across the many agencies involved in the Partnership and identified in this Strategy.

Progress against the Strategy will be reported annually to the Partnership Management Group. The **Worcestershire Partnership for the Environment (WPEG)** will oversee the work and the **Worcestershire Climate Change Task Group** (which reports to WPEG) involves and co-ordinates the key agencies involved in delivery.

Figure 12 identifies those organisations that will be responsible for delivering Section 5 of the Strategy – Reducing Climate Change Emissions.

Figure 13 identifies those organisations that will be responsible for delivering Section 6 of the Strategy – Plan and Adapt to the Effects of Climate Change.

7.2 The Worcestershire Local Area Agreement (LAA)

The [LAA](#) is an agreement between the Worcestershire Partnership and the Government that is the main delivery mechanism for the Sustainable Community Strategy. It acts as a “contract” between central government, local government and its partners. Once partners have agreed to a target in the LAA they are individually and jointly responsible for making sure it is delivered.

The Worcestershire Partnership has agreed a number of targets that contribute to tackling the challenges of climate change as part of its Local Area Agreement. The following **LAA targets** relate directly to this Climate Change Strategy:

- [NI 186 – Per capita CO₂ emissions in the LA area](#)
- [NI 188 – Adapting to climate change](#)
- NI 175 – Access to services and facilities by public transport, walking and cycling
- NI 187 – Tackling Fuel Poverty
- NI 193 – Municipal Waste Landfilled
- Local Target – Reduce the risk of flooding

This reviewed Climate Change Strategy will drive our commitment to meet LAA targets, in particular NI 186 and NI 188, and sets out some of the actions that we will take to make this happen.

The Government Office for the West Midlands (GOWM) reviews progress against LAA targets every six months and there is an opportunity to modify measures and targets on an annual basis.

You can find out more about the LAA and progress against LAA targets at:
www.worcestershirepartnership.org.uk

7.3 The Worcestershire Climate Change Action Plan

This Strategy sets out how we intend to tackle the challenges of Climate Change in Worcestershire.

It is supported by an Action Plan that covers each area of the Strategy and provides additional information about WHAT we will do and the measures we will use to track our progress and the targets that we have set ourselves. For some sections this is the same as the action plan to deliver the LAA target, for others there are specific actions that relate to this Strategy.

The Action Plan is a "working document" that is being changed and updated constantly through the Climate Change Strategy Task Group. For further information please contact Liz Alston, Sustainability Officer, Worcestershire County Council. ealston@worcestershire.gov.uk

7.4 The Worcestershire State of the Environment Report

The State of the environment report includes several indicators on Climate change. Progress will be updated annually. www.worcestershirepartnership.org.uk/WPEG/SOE

Figure 12 - Organisations and groups involved in Reducing Worcestershire's Climate Change Emissions

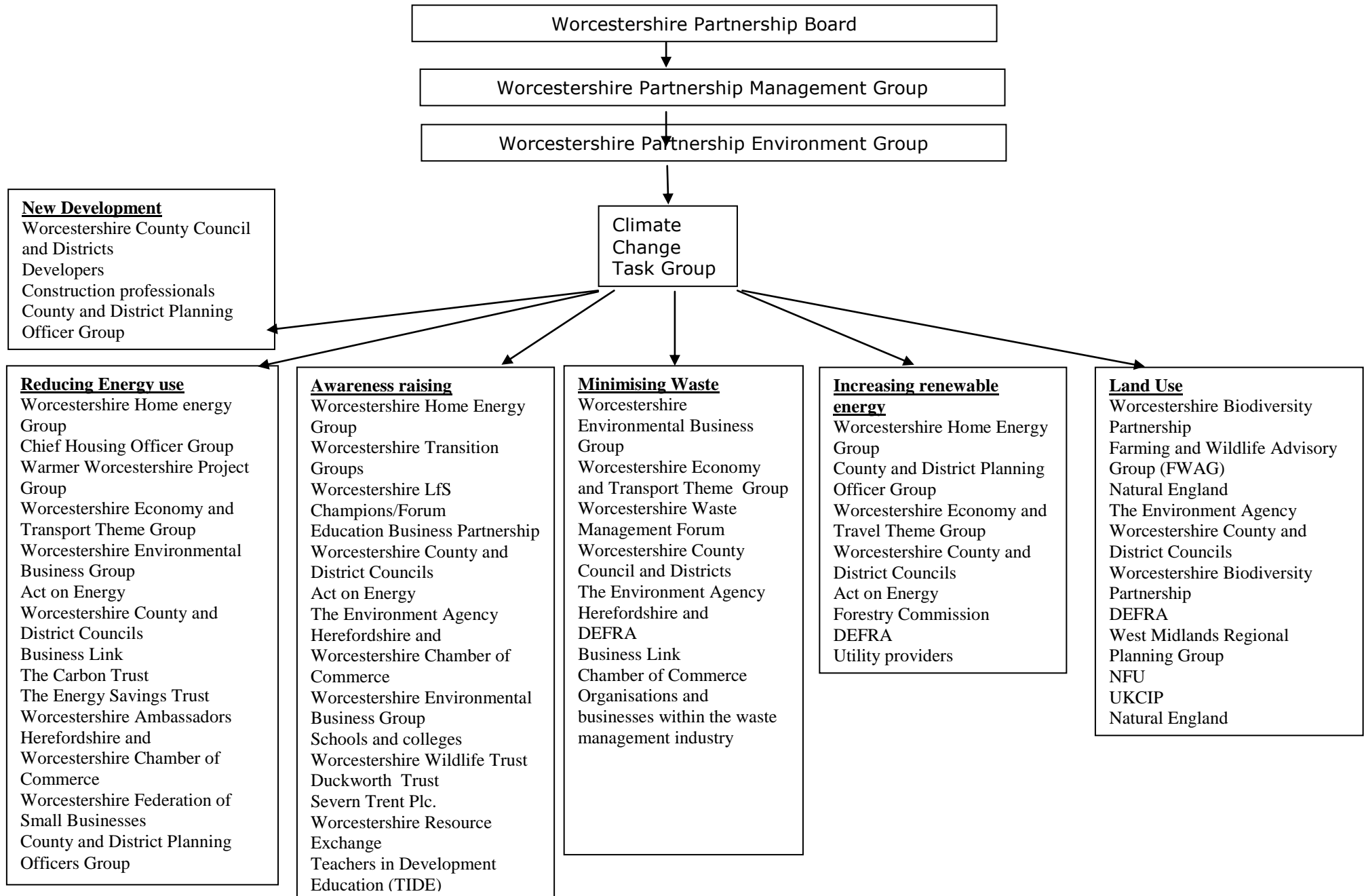
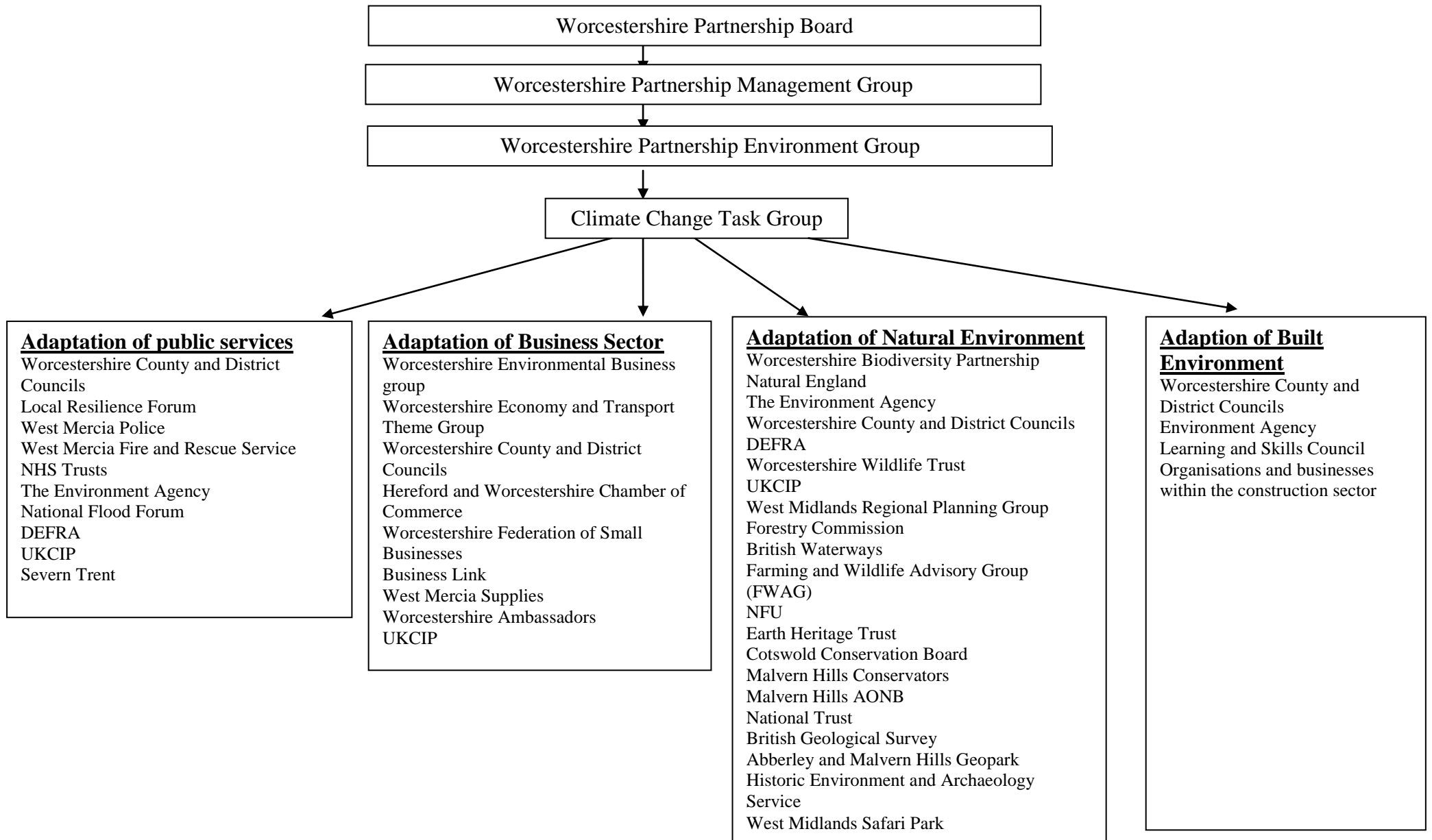
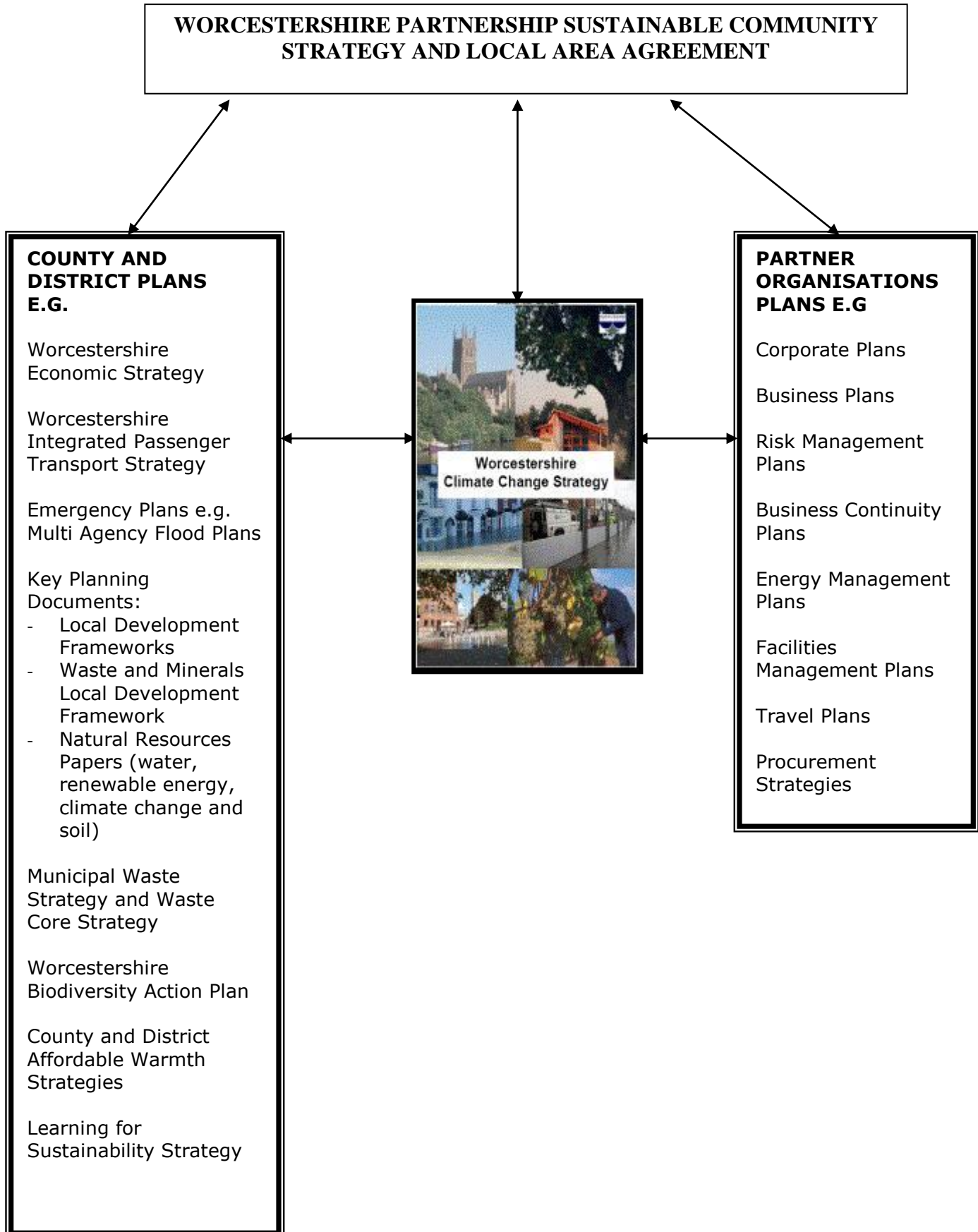


Figure 13 – Organisations involved in planning for and adapting to Climate Change in Worcestershire



7. 4. Plans and Strategies that will Contribute to the Delivery of the Climate Change Strategy

The diagram below illustrates some of the key plans and strategies that will contribute to the delivery of the Climate Change Strategy. These more detailed plans will pick up some of the themes, activities and actions described in this Strategy to ensure that they are integrated into mainstream delivery.



APPENDIX ONE – WORCESTERSHIRE PARTNERSHIP BOARD

Worcestershire Partnership Board

The Worcestershire Partnership Board is the strategic body of the partnership and is responsible for:

- Identifying and agreeing strategic priorities for the county
- Shaping the countywide Community Strategy and Worcestershire's Local Area Agreement
- Gaining partner agreement to the vision, values and outcomes of the partnership
- Agreeing the roles and responsibilities of the key elements of the wider partnership structure and delegating work to them
- Debating issues of mutual interest and concern
- Identify cross-cutting issues and gaps and overlaps in countywide provision
- Representing Worcestershire at a regional and national level.

Membership

Worcestershire County Council
Wyre Forest District Council
Wychavon District Council
Worcester City Council
Redditch Borough Council
Malvern Hills District Council
Bromsgrove District Council
Worcestershire County Association of Local Councils
Wyre Forest Matters
Wychavon Local Strategic Partnerships
Worcester Alliance
Redditch Partnership
Malvern Hills Partnership
Bromsgrove Partnership
Worcestershire Primary Care Trust
Worcestershire Acute Hospitals NHS Trust
Chamber of Commerce
Community First
Diocese of Worcester
Federation of Small Businesses
Hereford & Worcester Fire and Rescue Service
Herefordshire and Worcestershire Learning and Skills Council
Jobcentre Plus
Local Development Agency Network
Racial Equality Council
Thomas Vale Construction plc
University of Worcester
West Mercia National Probation Service
West Mercia Police Constabulary
West Mercia Police Authority
Worcestershire Wildlife Trust
Worcestershire Partnerships NHS Mental Health Trust

APPENDIX TWO – MEMBERS OF THE WORCESTERSHIRE PARTNERSHIP CLIMATE CHANGE TASK GROUP

Birmingham University
Worcestershire County Council
Bromsgrove District Council
Malvern Hills District Council
Redditch Borough Council
Wychavon District Council
Worcester City Council
Wyre Forest District Council
Chamber of Commerce
Worcestershire Wildlife Trust
Environment Agency
University College Worcester
Worcester Alliance
Bewdley Development Trust
Natural England
Hereford and Worcestershire Fire Service
Country Land Owners Association
Action on Energy
GOWM
The Duckworth Trust

Appendix 3 – Tasks required at levels of indicator NI 188

NI188: Assessment Matrix for Levels 0 to 4

	Leadership	Partnership	Assess current situation	Assessing future risks	Developing an approach	Action plan	Implementation	Monitoring and review
0	Identify lead officer Establish (outline) process		Audit of existing PPPs, etc. Begin process of looking at local risks		Establish process (see leadership)			
1	Public commitment to manage climate-related risks Ensure good communication within the authority	Communicate relevant vulnerabilities and risks to other partners	Undertake risk assessment of significant local vulnerabilities	Assess how risks and vulnerabilities may change in future using UK climate projections	Establish approach for next stage		(Examples include suggestion of evidence of any actions in place to address significant vulnerabilities and opportunities.)	
2		LA engaged with other LSP partners that are aware of LAs's work LSP (and other partners) have started to assess the impacts of cc on their objectives	Undertake comprehensive risk-based assessment of (current local) vulnerabilities Identify priority risks	Undertake comprehensive risk-based assessment of (future local) vulnerabilities Identify priority risks	Identify effective adaptation responses to priority risks		Started implementing adaptation measures in some priority areas	
3	Embed climate impacts and risks across council decision-making	Support LSPs in taking a risk-based approach to managing major weather and climate risks.				Develop a comprehensive Adaptation Action Plan	Implement appropriate adaptation responses in all priority areas	
4							All units in LA and all partners in LSP are implementing the comprehensive Adaptation Action Plan.	Robust procedures are in place for regular and continual monitoring and review to ensure progress with each measure and updating of objectives.

APPENDIX FOUR – WHAT CAN YOU DO? – WORCESTERSHIRE CLIMATE CHANGE PLEDGE

The **Worcestershire Climate Change Pledge** commits organisations to taking actions to tackle climate change and reduce their CO2 emissions.

Worcestershire Climate Change Pledge 2008/09

We pledge to support the objectives of the Worcestershire Climate Change Strategy which aims to:

- Reduce total greenhouse gas emissions in Worcestershire.
- Raise awareness of Climate Change issues.
- Assist adaptation to the impacts of Climate Change in Worcestershire.

In order to help achieve the above aims we will undertake the following actions in 2008/09 and report progress annually to the Worcestershire Partnership. (Please tick the relevant box)

1 STAR ACTIONS ★

- Raise awareness of climate change issues amongst our staff and in our activities involving the general public, e.g. through our newsletters, website and at events.
- Ensure that our organisation monitors our energy use, e.g. through regular accurate meter readings.
- Obtain advice and/or financial assistance to improve energy efficiency and save money at work.

2 STAR ACTIONS ★★

- Reduce our organisation's energy use e.g. through switching off appliances when not in use, better insulation, using energy efficient appliances and plant etc.
- Insulate our own homes properly and encourage our staff to do so too.
- Minimise our waste production and recycle as much as possible.
- Set up systems to monitor, report on our greenhouse gas emissions and set a reduction target.

3 STAR ACTIONS ★★★

- Carry out an assessment of likely impacts of climate change on our organisation and put in place plans to address them.
- Develop and implement a staff travel plan.
- Operate a low carbon/sustainable purchasing policy e.g. using local suppliers to reduce transport costs and emissions, buying energy efficient products etc.
- Use renewable energy, through procurement e.g. green electricity tariff and/or generation e.g. solar thermal, wood fuel, ground source heat etc.

We will also carry out other actions as appropriate in order to help meet the strategy's targets.

Name of Organisation _____

Signed _____ (Head of Organisation) Date _____



Please return your signed pledge or for any queries contact:

Liz Alston, Sustainability Officer, Worcestershire County Council,
County Hall, Spetchley Road, Worcester. WR5 2NP
tel: 01905 766745 or email: calston@worcestershire.gov.uk



At the end of the year we will send you a form for you to use to report your progress.

Please include your contact details for this purpose.

Name _____ Address _____
 _____ Post Code _____
 Tel no: _____ email: _____

Sources of Advice and in some cases financial assistance

Climate Change Pledge Guidance Notes
www.worcestershire.gov.uk/climatechangepledge

Energy Efficiency in the Workplace
The Carbon Trust tel: 0800 585794
www.thecarbontrust.co.uk

Energy Efficiency in Fleet & Housing
The Energy Savings Trust www.est.org.uk

Home Energy Efficiency
Coventry, Warwickshire & Worcestershire Energy Efficiency
Advice Centre (WEEAC)
tel: 0800 512012 www.weeac.org

Setting up Systems to Monitor and Report on Greenhouse
Gas Emissions

The Carbon Trust tel: 0800 585794 www.thecarbontrust.co.uk
Worcestershire County Council tel: 01905 766869
email: shartley@worcestershire.gov.uk

Staff Travel Plans

Worcestershire County Council tel: 01905 766212
staff@worcestershire.gov.uk

Waste Minimisation

Envirawise tel: 0800 585794 www.envirawise.gov.uk

The Impact of Climate Change & Taking Adaptive Action

UKCIP tel: 01865 432076 www.ukcip.org.uk



RECOMMENDED ENERGY EFFICIENCY MEASURES THAT CAN BE TAKEN BY COMMERCIAL, VOLUNTARY AND PUBLIC SECTOR ORGANISATIONS

Measure	Financial Saving Potential	CO ₂ saving Potential	Relative cost of Measure
Fit fixed period timers on stairwell lights	1	2	Low cost
Replace tungsten lamps with compact fluorescent lamps (with electronic control gear)	2	5	Low cost
Turn off lights when not in use	3	6	Free
Reduce thermostat temperature by 1oC	4	1	Free
Energy management of office equipment	5	7	Free
Replace 38mm fluorescent tubes with 16mm	6	8	Low cost
Install energy efficient air conditioning	7	9	Higher cost
Replace 26mm fluorescent tubes with 16mm	8	10	Low cost
Install most energy efficient boiler	9	3	Higher cost
Fit thermostatic radiator valves (TRV's) to all radiators	10	4	Low cost
Basic timer for lighting	11	11	Low cost

The table above is ranked by financial savings possible from most. (It should be noted that carbon savings do not necessarily follow the same ranking due to differences in the emission factors and costs of the different fuel types displaced).

Link to pledge below

<http://worcestershire.whub.org.uk/home/wcc-sustainability-climate-pledge-0809.pdf>