Select Committee on Climate Change

Report

October 2006

 [1]

The Adonis Blue Butterfly, symbol of the Kent Wildlife Trust. The emergence dates for this butterfly are now up to 20 days earlier compared to a few decades ago[2], a good example of how climate change may be affecting Kent now. However, in the North Downs of Kent, the Adonis Blue Butterfly relies on a food plant that is susceptible to drought[3]. The hotter, drier climate predicted for Kent by 2080 because of climate change could therefore threaten its long-term existence.

reduce

Kent County Council

[1] © Photo: Butterfly Conservation/Ken Willmott. Picture of Adonis Blue Butterfly used with kind permission of Butterfly Conservation. Website: http://www.butterfly-conservation.org/index.php

[2] *Millennium Atlas of Butterflies in Britain and Ireland*, Jim Asher et al, Oxford, 2001.

[3] Evidence received from the Kent Wildlife Trust at the hearing on 28 April 2006, (paragraph 9).

CONTENTS

1 Foreword by the Chairman of the Select Committee

"It is not necessary to change.

Survival is not mandatory".

- William Edwards Deming (1900 – 1993)

Climate change has become a high profile issue and rightly so. It represents a very real threat to the residents of Kent. I do not say this lightly. The predicted scenarios for Kent covering the period between the 2020's and the 2080's will have major impacts on life in the county. The predicted effects under the "high emissions" scenarios make alarming reading. Southeast England will suffer more than most parts of the UK and Kent will bear the brunt of this due to its geography and geology. As a county, we are more exposed than most and this will require a robust and effective response.

Fortunately, we **can** do something about climate change. There are proven, pragmatic solutions. The Select Committee has identified these under the headings of "Adaptation", "Mitigation" and "Community Leadership". The recommendations impact the work of Kent County Council ("KCC") across most of its directorates.

Some argue it does not matter what we do here in Kent to address climate change, as others in the world are creating more of the problem. I have an enduring memory of hearing the evidence of Becky Ribbens, a Member of the Kent Youth County Council. Becky's words were a powerful reminder that our efforts to tackle climate change must succeed if we are to ensure our children inherit a world fit to live in. We do not want our children to look back and ask why we did not do enough when we knew the consequences. Kent's emissions may be relatively small globally, but they are significant nonetheless and we must show leadership if we are to change many of the world's damaging habits.

If asked how KCC is doing in tackling climate change issues, the answer would be fair, but must do better. A good start has been made and there is some excellent work underway and the KCC staff driving this should be congratulated. There is a real need, however, to ensure a more clearly defined strategy to enable better delivery of the relevant policies.

Some solutions will cost, but will be cheaper and easier to achieve now than if left to implement in the undetermined future. KCC is in a position to accommodate a longer "pay-back" period to achieve this. As energy and other costs increase, these solutions become relatively less expensive.

Time is not on our side. The most recent reports suggest man has less than a decade in which to make an impact on climate change. If we delay, we risk turning a dangerous possibility into a dangerous certainty. KCC must lead by implementing solutions in its own estate and operations. KCC must partner with the people of Kent to better understanding of climate change issues and their solutions.

The Select Committee heard many witnesses via hearings and written evidence. The Select Committee also heard from Members of the Public who attended Local Boards where climate change was the topic of discussion. This was the first time a Select Committee Topic Review was discussed at Local Boards and the attendance demonstrates the importance of the issue to Kent residents. On behalf of the Select Committee, may I thank everyone who gave their time and evidence.

I began this foreword with a quotation. I will end with one. A reminder to change our ways in order to avoid the worst predictions for climate change. In evidence we heard if everyone on the planet lived as we do in southeast England, we would need 3.5 “Planet Earth’s” to sustain us. In conversation at Local Boards, I found telling people the Garden of England may not be able to grow apples made many think deeply. John Galsworthy once wrote ‘If you do not think about your future you cannot have one.’ Time not just to think but to act – the future is closer and rather less comfortable than many of us realised.

Mr Chris Wells, Chairman of the Select Committee.

2 Executive Summary

2.1 Why the Select Committee Has Taken Place and its Purpose

2.1.1 Climate change[4] is an issue of growing public concern and awareness. It is also an increasing priority for government at international[5], national[6] and local[7] level. The Policy Overview Co-ordinating Committee established a Select Committee on Climate Change in August 2005. The purpose of the Select Committee was to:

- Produce a strategic report and recommendations on behalf of the former Strategic Planning Policy Overview Committee (SPPOC) (now the Environment and Regeneration Policy Overview Committee (ERPOC)).

- Report its recommendations to ERPOC, Cabinet and full Council.

[4] For the definition of climate change used in this report, please see section 4.1.2. For a further detailed definition, please see the glossary.

[5] For example, the formation of the Intergovernmental Panel on Climate Change ("IPCC") in 1988, assembled by the world's governments to provide scientific advice on climate change. See www.ipcc.ch/about/about.htm.

[6] For example, the formation of the UK Climate Impacts Programme ("UKCIP") in 1997, see evidence in this report and www.ukcip.org.uk.

[7] For example, the Nottingham Declaration on Climate Change to which Kent County Council is a signatory. This is a declaration for Local Authorities to commit to tackling the impact of climate change. See www.lga.gov.uk/Briefing.asp?lsection=59&id=SXB9C9-A77F8CF8&ccat=216.

2.1.2 The Terms of Reference for this Select Committee are:

- The impact of climate change in short, medium and long terms for Kent's economy, society and environment, including related impacts of extreme weather conditions.

- KCC's Community Leadership role in adapting to and mitigating the impact of climate change. This includes recognising ways that KCC can directly and indirectly influence our contribution to climate change.

2.1.3 The strength and volume of the evidence presented leads the Select Committee to readily accept the scientific consensus that climate change over and above that which can be explained by natural variation is happening, and that human activity is responsible. As such, acceptance of these propositions is the most - indeed, the only - sensible basis for future policy development on climate change.

2.1.4 Three of the biggest obstacles for securing a commitment to action on climate change are that:

- Some of its most dramatic predicted effects seem a long way off, and it is difficult to predict when they might occur.

- There is some awareness of the impact of global warming on distant parts of the planet – the polar ice caps, expanding deserts, low lying Pacific island states, for example – but very little understanding and awareness of the profound changes facing Kent.

- It is difficult to attribute any particular extreme weather event – whether that be the current drought or the flooding in New Orleans in 2005 for example – to climate change.

2.1.5 Having considered these questions in some detail, however, the Select Committee believes that:

- The evidence that climate change, over and above that which can be explained by natural variability, is already happening is overwhelming. As such, it needs to be addressed as a problem for today, not just for tomorrow, particularly as the warming we will experience until the 2040s has already been determined by past emissions.

- The impacts of climate change for the UK will be acute. Kent will experience some of those impacts, notably rising temperatures and reduced summer rainfall, more sharply than any other part of the country.

- Uncertainty is not an excuse for inaction. Governments, central or local, are likely to face grave political consequences if they do not act and the impacts become more apparent, which they may do rapidly and unexpectedly.

2.2 Recommendations

2.2.1 The Select Committee's recommendations are summarised below and are not ranked in order of importance. The detail supporting recommendations are in the report as indicated and readers are referred to these sections for further details.

No.	Summary Description of Recommendation.	Section for Detail.	Detailed Recommendation Section Reference / (Page)
1	An explicit corporate acceptance of climate change and how human activity contributes to it.	Is Climate Change Happening?	4.2.3 / (page 23)
2	Detailed assessment of climate change impacts on KCC services and development of adaptive responses.	Adaptation	6.3.8 / (page 56)
3	Ensure climate change impacts on flood risk, water resources and emergency planning are taken into account.	Adaptation	6.11.5 / (page 77)
4	Provide support for better sustainable energy advice to Kent's residents.	Mitigation	7.5.7 / (page 85)

No.	Summary Description of Recommendation.	Section for Detail.	Detailed Recommendation Section Reference / (Page)
5	Complete a feasibility study for use of biomass in KCC buildings and replace conventional fuels with bio-fuels in KCC vehicles where possible.	Mitigation	7.7.7 / (page 89)
6	Increase support for energy efficiency and renewable energy, particularly micro-generation, in the KCC estate and across Kent as a whole.	Mitigation	7.9.12 / (page 98)
7	Review transport policy to achieve an overall reduction in emissions from transport in the KCC estate and across Kent as a whole.	Mitigation	7.12.8 / (page 104)
8	Make more efficient use of land in the development process and meet higher standards of sustainable construction.	Mitigation (and adaptation)	7.17.3 / (page 110)
9	Introduce a Climate Change Action Plan, supported by clear targets.	Community Leadership	8.4.10 / (page 127)
10	High profile communications programme.	Community Leadership	8.5.5 / (page 129)
11	Clarify political and management leadership and accountability on climate change within KCC.	Community Leadership	8.6.4 / (page 130)
12	Improve education on climate change impacts.	Community Leadership	8.7.6 / (page 133)

3 Introduction and Background

3.1 Select Committee on Climate Change Membership

3.1.1 The Select Committee on Climate Change ("the Select Committee") consisted of eight Members of Kent County Council ("KCC"), five Conservative, two Labour and one Liberal Democrat:

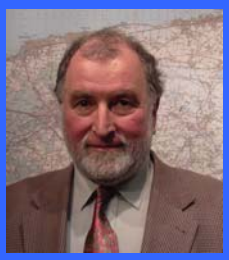
Mrs Christine Angell
Labour
Dartford East

Mr Adrian Crowther
Conservative
Sheppey

Mrs Trudy Dean
Liberal Democrat
Malling Central

Mr Charles Hibberd
Conservative
Birchington & Villages

Mr David Hirst
Conservative
Herne Bay



Mr Godfrey Horne MBE
Conservative
Tonbridge

Mr Tom Maddison
Labour
Dartford West

Mr Chris Wells
Conservative
Margate & Cliftonville

Chairman

3.2 Overview of Process

3.2.1 In spring 2006, the Select Committee received evidence from a wide range of stakeholders, scientific experts, KCC Officers, campaigning organisations and sector representative organisations. The Select Committee also received evidence from national government, regional bodies and local authorities within and outside Kent.

3.2.2 Evidence was received either orally at Select Committee hearings or via requests for written evidence. A full list of witnesses, who attended Select Committee hearings, as well as visits made and written evidence received can be found in section 11 and Volume 3 of this report.

3.2.3 For the first time in a Select Committee process within KCC, the public were able to add their comments directly through Local Board meetings in Dartford, Thanet and Shepway where climate change was the topic of discussion. Members of the public were also able to contribute by completing an answer to the question "Name one thing that you think KCC should be doing to tackle climate change". The evidence received is shown in Appendix 1.

3.3 Structure of Report

3.3.1 The Select Committee found that to address the impact of climate change, a distinction must be made between adaptation[8] – adjusting to the predicted or

[8] A definition of Adaptation can be found in the glossary.

actual impacts - and mitigation[9] – addressing the causes by reducing greenhouse gases in the atmosphere. The other key themes that arose during review are:

- Providing strategic leadership.
- Leading by example in managing KCC's own estate.
- Service provision (KCC services and services that KCC can influence).
- Community leadership.

3.3.2 In this report, the Select Committee wishes to emphasise both:

- The impact of climate change on Kent.
- The links climate change has with other issues that people are interested in.

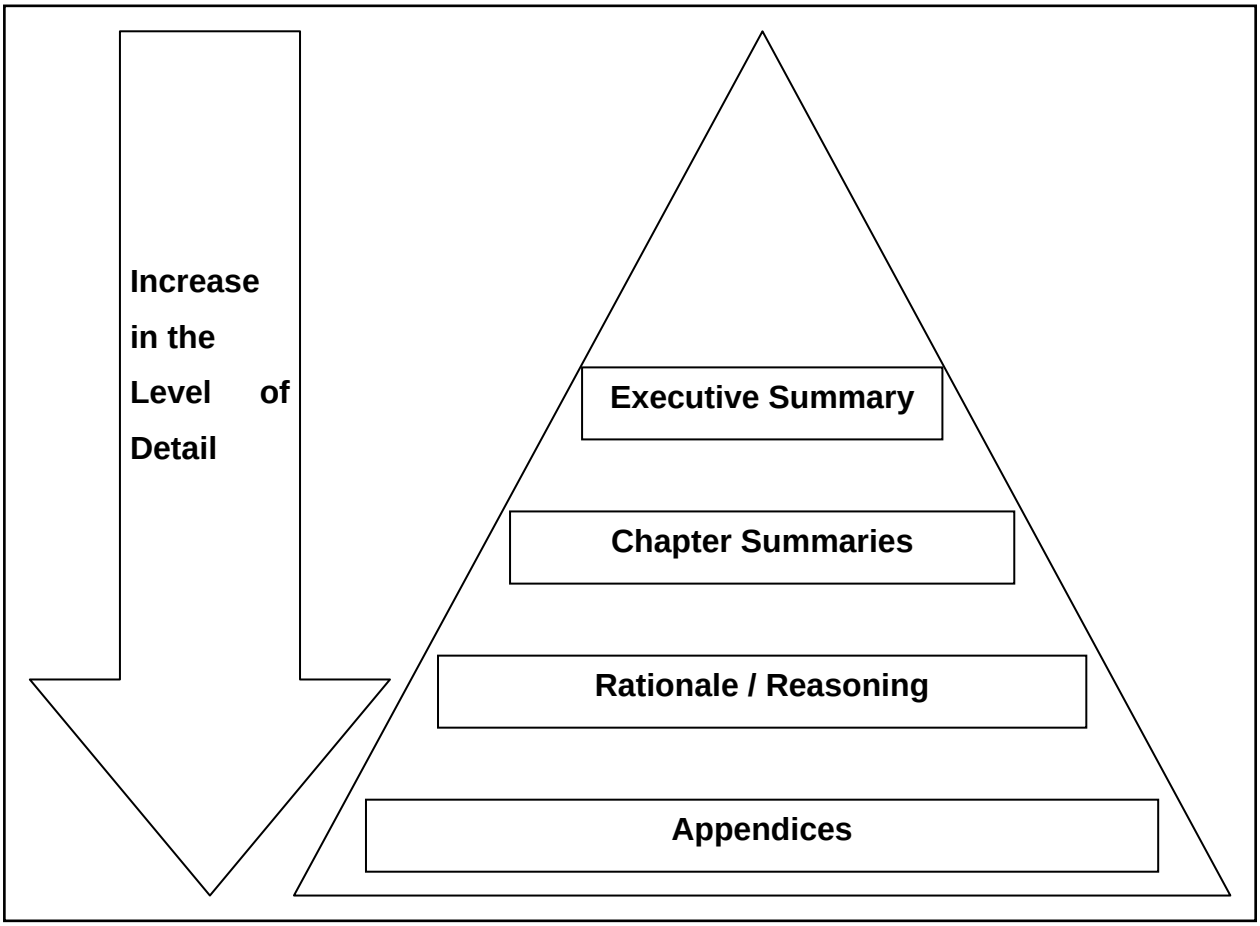
3.3.3 In addition, the Select Committee wishes to ensure that this report appeals to a wide audience. This audience can be classified as follows:

- Readers interested in the Executive Summary (short report) only.
- Readers interested in particular aspects of the report only.
- Readers interested in reading the whole report to understand all the aspects of the impact of climate change on Kent.

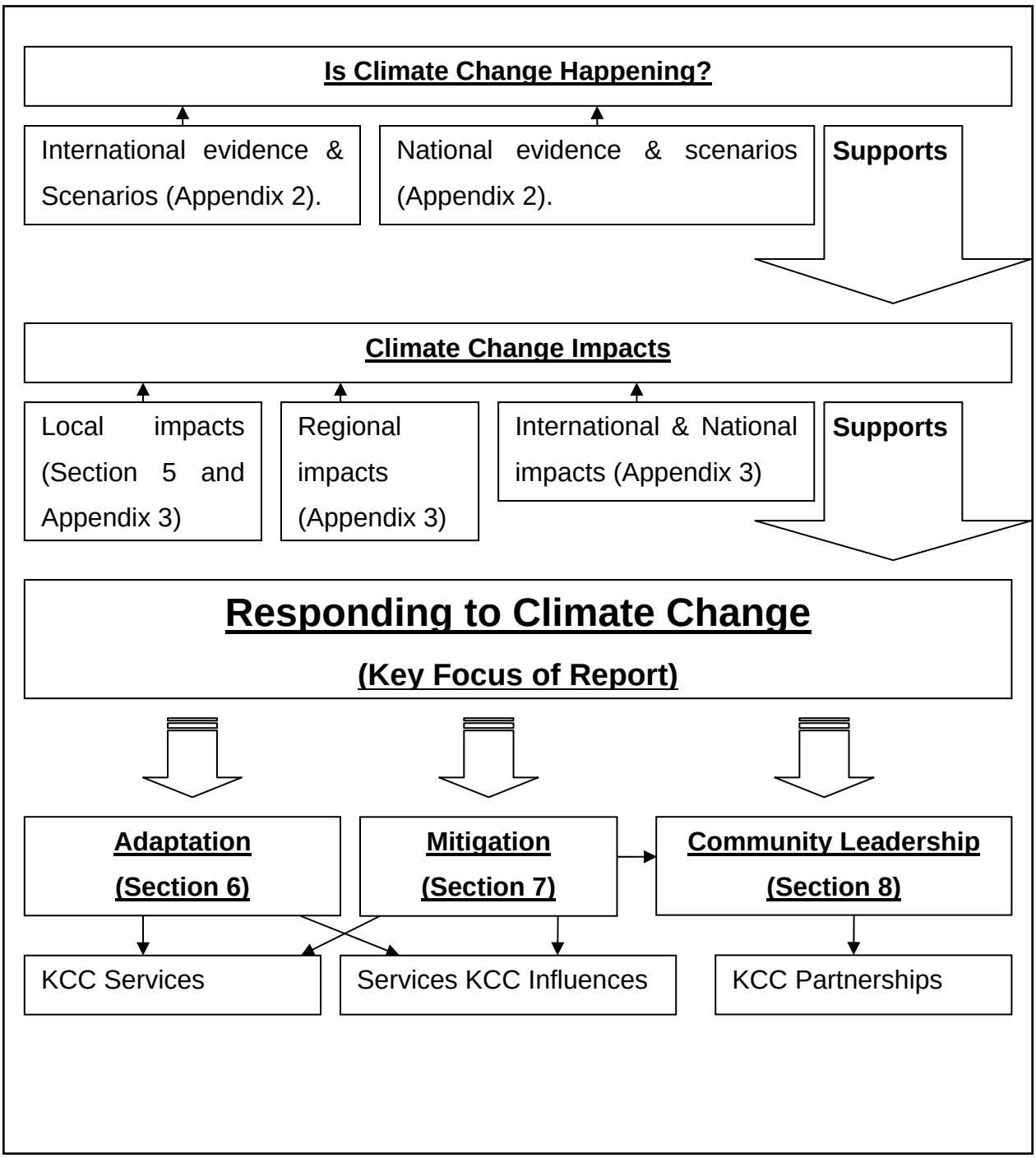
[9] A definition of Mitigation can be found in the glossary.

3.3.4 To aid the understanding of this report by readers, the report is structured as indicated in diagram 3.3.5. Further details of how key themes link with each other is shown in diagram 3.3.6. A full glossary that gives definitions for key terms and abbreviations used in this report, including terms such as climate change, adaptation and mitigation, can be found in section 10 at the end of the report.

3.3.5 **Diagram 3.3.5:** Structure of report



3.3.6 **Diagram 3.3.6:** Structure of key themes


Is Climate Change Happening?
International evidence & Scenarios (Appendix 2).
National evidence & scenarios (Appendix 2).
Supports
Climate Change Impacts
Local impacts (Section 5 and Appendix 3)
Regional impacts (Appendix 3)
International & National impacts (Appendix 3)
Supports
Responding to Climate Change
(Key Focus of Report)
Adaptation (Section 6)
Mitigation (Section 7)
Community Leadership (Section 8)
KCC Services
Services KCC Influences
KCC Partnerships

4 Is Climate Change Happening?

4.1 Background

4.1.1 The Select Committee started its inquiry by taking a considerable amount of evidence on the two key questions in the international debate about climate change:

- Is climate change happening?
- How much is it influenced by human activity?

4.1.2 The earth's climate is, of course, always changing, but for the purposes of this report 'climate change' should be understood to mean change which is greater than can be explained by the 'natural' variation in the earth's climate alone[10]. The Select Committee heard that there is an almost universal consensus within the global scientific community that the earth is warming up[11]. It did so by 0.6ºC during the last century and this is accepted even by previously sceptical members of the scientific community.

4.1.3 While 0.6ºC may not sound significant, the EU has identified 2ºC as the level beyond which climate change would cease to be 'safe'. Even below this level would not necessarily be 'comfortable', bearing in mind that the difference in

[10] A more detailed definition of climate change can be found in the glossary.

[11] Evidence received, *inter alia*, from Mr Peter Moore, KCC Environment Strategy Manager at the hearing on 3 April 2006, as well as Mr Mark Goldthorpe at the hearing on 10 April 2006, Mr Peter Martin of Carbon**sense** at the hearing on 12 April 2006 and Mr Gerry Metcalf of UKCIP at the

average global temperature between today and the last ice age is about 5ºC. In this light, a rise of 1.5ºC in average temperature Kent by the 2020s and up to 6ºC by the end of the century - the former now seems inevitable as a result of past emissions, and the latter is likely unless we reduce global carbon dioxide emissions substantially - should be a cause of great concern[12].

4.1.4 The extent to which human activity influences climate change proves slightly more controversial. There is clear consensus within the Intergovernmental Panel on Climate Change and the wider scientific community that the strong warming of the last 50 years cannot purely be explained by 'natural' variation and is mostly due to human activity, particularly the burning of fossil fuels. This has pushed atmospheric levels of carbon dioxide, with which there is a direct relationship with global temperature, from below 300 parts per million in the early 20th century to 380 parts per million today – its highest level for hundreds of thousands of years[13].

4.1.5 Details of the scientific evidence received by the Select Committee and how it proves climate change can be found in Appendix 2.

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hearing on 3 May 2006. See also the UKCIP02 scenarios for the United Kingdom: http://www.ukcip.org.uk/resources/publications/documents/UKCIP02_briefing.pdf

[12] Evidence received from Mr Peter Moore, KCC Environment Strategy Manager, at the hearing on 3 April 2006.

[13] See note 11 *supra*.

4.2 Acceptance That Climate Change is Happening

4.2.1 A recurring theme in evidence was that corporate acceptance of climate change is a key issue[14].

4.2.2 The Select Committee is convinced that the importance of corporate acceptance of climate change and acknowledgment of the contribution of human activities to it, is an important step for KCC and this forms the basis of the Select Committee's first recommendation.

4.2.3 **Recommendation 1**: An explicit corporate acceptance of climate change and how human activity contributes to it.

The Select Committee recommends that KCC explicitly acknowledge:

1. Climate change over and above that which can be explained by natural variation is happening and accelerating.

2. The impacts of climate change pose significant risks to the services provided by KCC and to Kent's communities.

3. KCC has a responsibility for Kent's residents and future generations to adapt to and mitigate climate change.

[14] For example, see evidence received from Mr Jim Boot of Maidstone Borough Council at the hearing on 26 April 2006 (see paragraphs 5 and 11), Mr Gerry Metcalf of UKCIP at the hearing on 3 May 2006 (see paragraphs 13 *et seq)* and Mr Steve Waller of I&DeA at the hearing on 3 May 2006 (paragraphs 3 and 7 *et seq)*.

4.2.4 The scientific consensus is reflected in a high degree of political consensus[15] that man-made climate change is happening and requires an urgent and co-ordinated response. Evidence received demonstrated that the most effective response to climate change occurred where there was cross-party agreement[16]. The Select Committee wishes to highlight this very important point.

4.3 Why Climate Change is Relevant to Local Authorities

4.3.1 As climate change will affect the 'social, economic and environmental well-being' of the community, local authorities have duties and powers under the Local Government Act 2000 to address this.

4.3.2 Government guidance also emphasises that local authorities consider the impact of climate change on their own estate, planning, long-term policies, community strategies, emergency procedures and service planning. The Government published a revised UK Climate Change Programme in March 2006 which

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[15] For example, quotes from senior Labour, Conservative and Liberal Democrat MP's:
"If what the science tells us about climate change is correct, then unabated, it will result in catastrophic consequences for our world…… surely the balance of risk for action or inaction has changed". *The Rt. Hon. Tony Blair MP, Prime Minister.* See www.pm.gov.uk/output/Page6333.asp.
"The need to tackle climate change is urgent….the effects of climate change are being felt right here, right now. We need to act now. Tony Blair was right to make climate change a central component of the G8 agenda". *The Rt. Hon David Cameron MP, Leader of HM Opposition.* See http://comment.independent.co.uk/commentators/article323747.ece
"We aim to push climate change up the political agenda and make it more likely that the radical action necessary will be taken. The challenge of climate change is so serious that parties need to strive to find common ground". *Mr Norman Baker MP, speaking when he was the Environment Spokesperson for the Liberal Democrats.*
See: http://www.epolitix.com/EN/News/200601/177b7917-b5ab-415e-86ea-8bd0e20d8546.htm

[16] Evidence in relation to Woking Borough Council received from Mr John Thorp of the Energy Conservation and Solar Centre at the hearing on 15 May 2006, (paragraphs 3,4 and 14).

indicated that a new carbon reduction performance reporting requirement is to be introduced for local authorities after Continuous Performance Assesment ("CPA") finishes in 2007[17].

4.3.3 The Select Committee concludes that this, coupled with the Climate Change and Sustainable Energy Act 2006[18] and tougher planning guidance on climate change[19], clearly demonstrates why climate change must be included in local authority planning now.

4.3.4 The Select Committee also notes that KCC has a responsibility as an employer to consider the impact of climate change on staff.

4.3.5 Within KCC, the policy basis for action can be found in the Nottingham Declaration signed by KCC[20] in 2001, the Kent Environment Strategy[21] in 2003

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[17] Evidence received from Mr Steve Waller of I&DeA at the hearing on 3 May 2006 (paragraph 4).

[18] The Act gives new powers and duties to local authorities to promote micro-generation and energy efficiency.

[19] The Department for Communities and Local Government is currently drafting a Planning Policy Statement on Climate Change, with which all local authority spatial plans will have to accord, and will consult on the draft later this year. Evidence received from Mr Rob Shaw of the Town and Country Planning Association at the hearing on 12 April 2006 (paragraph 14 *et seq)*.

[20] See note 7 *supra.*

[21] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy, (See Appendices for Sector by Sector impact)*. Report submitted and presented to the Select Committee by Mr Peter Moore, KCC Environment Strategy Manager, on 3 April 2006. See Appendix 5.

and the *Vision for Kent* document[22], Kent's community strategy, which identifies climate change as one of seven major cross-cutting challenges facing Kent. The Select Committee notes however that further action is required to translate these commitments into action and this is discussed in section 8.4.

4.3.6 Across the County, there is also an emerging consensus for action on climate change, evidenced by submissions from the Kent Partnership, District Councils in Kent, such as Ashford and Tunbridge Wells Borough Councils[23] and oral evidence presented by Maidstone Borough Council[24]. This is discussed further under Community Leadership in section 8.

[22] Written evidence from the Kent Partnership.

[23] Written evidence from these organisations.

[24] Evidence received from Mr Jim Boot of Maidstone BC at the hearing on 26 April 2006 .

5 Climate Change Impacts on Kent

5.1 Summary of Points Covered in Section

- **Key climate change impacts like higher summer temperatures, increased flood risk and increased frequency of drought will affect Kent more than most other parts of the UK for a variety of demographic and geographic reasons. Kent therefore has atypical needs and this must be stressed.**

- **Climate change poses major social, economic and environmental challenges for the quality of life in Kent.**

- **While climate change may also bring benefits and opportunities, some of these may be temporary and are likely to be substantially outweighed by the costs and disadvantages.**

- **Kent-specific information on climate change impacts is limited and there is a need for further research to help different sectors understand the impacts and respond effectively**

- **In seeking to adapt to the impacts of climate change, it is vital that we avoid steps which will simply accelerate climate change by increasing the emission of greenhouse gases.**

5.2 Section Introduction

5.2.1 This section covers:

- What climate change will mean for Kent.
- Recent experiences of extreme weather in Kent associated with climate change.
- Strategic infrastructure impacts of climate change in Kent.
- What makes Kent particularly vulnerable to climate change.
- Positive benefits Kent can expect from climate change.
- Negative impacts of climate change on Kent.
- The balance of positive and negative impast of climate change on Kent.

5.3 What Will Climate Change Mean for Kent?

5.3.1 The Select Committee received considerable evidence quantifying the international, national and regional impacts of climate change which is summarised in Appendix 3.

5.3.2 There is far less Kent-specific information available. However, reference to the UK Climate Impacts Programme's (UKCIP) 2002 Scenarios[25] - known as 'UKCIP02' - demonstrates that due to its geographic location and long coastline, Kent is expected to suffer greater impacts from climate change than other areas of the South East[26].

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[25] See: http://www.ukcip.org.uk/resources/publications/pub_dets.asp?ID=14

[26] It is suggested an example of this can be found in evidence received from the Environment Agency at the hearing on 28 April 2006 (paragraph 7). The Environment Agency noted that of the approximately £200m annual budget for maintaining flood defences for the UK, £20m (10% of the total) is spent in Kent, compared to £4m (2%) in Sussex and £1m (0.5%) in Hampshire.

5.3.3 The Select Committee concluded that based on all the evidence, Kent has atypical needs. This is an important point and the Select Committee stresses that it must be emphasised when considering actions to prepare for the impact of climate change.

5.3.4 The Select Committee noted from feedback in Appendix 1 and at the Local Boards where climate change was discussed that the public wanted information on key Kent impacts of climate change. Such information is therefore presented in the main body of the report.

5.3.5 The Select Committee particularly noted evidence received from Mr Peter Moore, KCC's Environment Strategy Manager, in his report *Climate Change Impacts in Kent*[27] on Kent-specific impacts that was prepared for this Select Committee.

5.3.6 This evidence details the range of impacts facing Kent. The Select Committee found this useful as a reference point for the drafting of this report. The Select Committee also feels that this information should be made available to readers who require more detail on Kent-specific impacts. This report is therefore included in Appendix 4.

[27] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy, (See Appendices for Sector by Sector impact)*. Report submitted and presented to the Select Committee by Mr Peter Moore, KCC Environment Strategy Manager, on 3 April 2006.

5.4 Recent Experiences of Extreme Weather

5.4.1 Kent's recent experience of extreme weather conditions is vividly represented by:

- The great storm of October 1987, with gusts of wind recorded at a speed of 90 knots (103 mph) in parts of Kent, a ship capsizing at Dover and a ferry being driven ashore near Folkestone[28].

- The River Darent experiencing low flows and running dry in the 1980s and 1990s, combined with episodes of flooding more recently[29].

- Extensive and repeated winter flooding in 2000[30].

- The heatwave of 2003, during which the highest UK temperature since records began of 38.5 degrees Celsius was recorded in Kent at Brogdale, near Faversham on 10 August 2003[31].

- The drought of 2005-06, a result of successive dry winters, with hosepipe bans in force throughout the winter in certain areas of Kent[32].

- Bewl Water, one of the main reservoirs serving Kent, at a record low in January 2006[33] requiring it to be re-filled with water diverted from the River Medway.

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[28] See: http://www.metoffice.com/education/secondary/students/1987.html

[29] See: http://www.bbc.co.uk/kent/news/stories/200301/03/floods.shtml

[30] See: http://news.bbc.co.uk/1/hi/england/kent/4363522.stm

[31] See: http://www.metoffice.com/climate/uk/extremes/index.html

- The heatwave of July 2006 which broke records for the hottest average temperature for the month of July and the record for the hottest July day – 36.5ºC at Wisley, Surrey[34].

- Unexpected heavy snowfall in spring 2006 in parts of Kent[35].

5.4.2 It is impossible to prove a direct link with climate change and any one of these events, but they clearly fit the scientific predicted pattern of more extreme weather events.

5.4.3 Across Kent, other less dramatic changes are being recorded which suggest that climate change is already having an impact. These include:

- Sea level rises. For example, those recorded at Sheerness show an increase of nearly 300mm between 1850 and 2000[36] resulting in higher storm surges.

- Earlier emergence dates for butterfly species - up to 20 days earlier[37] in the case of the Adonis Blue, symbol of the Kent Wildlife Trust.

- Earlier arrival and breeding success of bird species, for example the Hobby, which require a warmer climate[38].

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[32] For example, a hosepipe ban has been in force since August 2005 in the Mid-Kent Water supply area. See http://www.midkentwater.co.uk/drought/current%20restrictions.htm

[33] See note 21 *ibid*.

[34] See: http://news.bbc.co.uk/1/hi/uk/5219848.stm

[35] See: http://news.bbc.co.uk/1/hi/england/4894934.stm

[36] See: http://www.defra.gov.uk/environment/statistics/globatmos/kf/gakf14.htm

[37] *Millennium Atlas of Butterflies in Britain and Ireland*, Jim Asher et al, Oxford, 2001.

5.5 Strategic Infrastructure

5.5.1 Examples of climate change impacts on strategic infrastructure include:

5.5.2 Kent's coastal towns - many coastal communities will face climate change impacts such as sea level rise, increased flood risk and extremes of weather. In the long-term, s*ome* parts of *some* communities may become economically and environmentally unsustainable.

5.5.3 Kent's ports and airports – changes in storm patterns and wave energy pose risks to port infrastructure, such as buildings, roads and runways, and services.

5.5.4 Dungeness Power Station - the shingle ridge which protects the power station from coastal flooding is constantly replenished by moving shingle (via both natural and man-made processes) from elsewhere on the peninsula. While the power station itself is adequately protected, surrounding low-lying land on the peninsula could be flooded[39].

5.5.5 The Dover-Folkestone Railway - the line is only slightly above sea level at some points and protection from erosion in the long-term will require expensive maintenance of coastal defences.

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[38] 'Global warming could be expected to help a species on the northern edge of its range in Europe…Hobbies would appear to be arriving back on their breeding territories one or two weeks earlier than was recorded thirty years ago.' Kent Ornithological Society *Kent Bird Report 1999*, 2001.

[39] See indicative floodmap at section 6.10.6A .

5.5.6 The A20 at Shakespeare Cliff - the proximity of the A20 to the cliff edge is striking on the western approach to Dover. If allowed to continue naturally, erosion of the chalk cliff will eventually reach the road in the long-term. Other trunk roads and minor roads could face similar pressures in future, requiring sustained investment commitments.

5.5.7 River Medway flood defences - the Medway is one of the longest rivers in the south east (110km) and defended upstream of Tonbridge by a flood defence scheme that currently offers protection in events of greater than 1 in 100 years probability. This calculation is based on historic records. Climate change will mean re-assessing the level of such protection.

5.5.8 The Thames Gateway – parts of the Thames Gateway are susceptible to flooding and development in this area could exacerbate the problem. Flooding in the Thames Gateway is discussed further in section 6.10.3.

5.6 Factors which Make Kent Vulnerable to Climate Change

5.6.1 Several factors combine to make Kent atypically exposed to climate change impacts:

5.6.2 North, south and east facing coasts, exposed to erosion, rising sea levels - exacerbated by the fact the south east is "sinking"[40] - storm surge and wave damage.

[40] Of the 5.4mm per year sea level rise used by the Environment Agency as the current figure for the South East, it is estimated that about 1mm per year, or less than 20%, is due to this geological

5.6.3 A high proportion of low-lying land (see diagram 6.10.6A) and high vulnerability to saline pollution of freshwater supplies[41].

5.6.4 Over 50,000 properties at risk of flooding[42]. In addition, a large proportion of the population in these areas may be considered as "vulnerable" and may require special assistance in the event of flooding.

5.6.5 High traffic volumes both within and through the county because of our international gateway status and areas of urban density, resulting in emissions and air quality problems will be exacerbated by climate change – for example many serious heat-related illnesses in 2003 were linked to air quality episodes triggering respiratory difficulties[43].

5.6.6 A relatively developed landscape[44] - a significant factor in flood risk calculations, as developed land does not perform its natural function of soaking up water in the same way as undeveloped land.

"sinking". This is known as isostatic sea level rise. See: http://www.environment-agency.gov.uk/yourenv/eff/1190084/natural_forces/sealevels/

[41] Evidence received from Mr John Archer of the National Farmers Union at the hearing on 12 April 2006 (paragraph 4).

[42] EA figures cited in *Kent Environment Strategy: 2005 Progress Report, p28*, KCC March 2005. This document can be found at: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

[43] See: http://news.bbc.co.uk/1/hi/health/3162949.stm

[44] For example, see the EU-wide *Corine Land Cover Survey*, p13 published in 2000: http://terrestrial.eionet.europa.eu/CLC2000/docs/publications/corinescreen.pdf . The *Kent Habitat Survey 2003,* p8, estimated that Kent's "urban" area was 13%. See: http://www.kentbap.org.uk/assets/library/documents/KHS_2003.pdf

5.6.7 Reliance on groundwater sources for about 75%[45] of our public water supply, making us vulnerable to drought.

5.6.8 Projections of housing and commercial development which will exacerbate some of the identified impacts above - approximately 120,000 new homes are planned over the next 20 years[46].

5.6.9 Proximity to continental Europe, increasing the risks of new, invasive species[47] or diseases arriving via Kent.

5.7 Positive Benefits of Climate Change for Kent

5.7.1 Climate change may have some beneficial impacts for Kent[48]. The more positive aspects Kent can be expected to enjoy are:

- The development potential of domestic **tourism**, at least until beneficial change such as a warmer climate reaches the point of becoming uncomfortable or unsustainable due to, for example, water scarcity.

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[45] See deposit documents supporting the Kent and Medway Structure Plan ("KMSP"): http://www.kmsp.org.uk/chapter09.html

[46] See: http://news.bbc.co.uk/1/hi/business/5263778.stm. This point is further discussed in section 7.15.1.

[47] For example, see evidence received from Mr Richard Moyse of the Kent Wildlife Trust at the hearing on 28 April 2006 (paragraph 4 *et seq)*.

[48] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy, (See Appendices for Sector by Sector impact)*. Report submitted and presented to the Select Committee by Mr Peter Moore, KCC Environment Strategy Manager, on 3 April 2006.

- The development potential of **agriculture** due to a longer growing season, subject to these benefits not being outweighed by the disadvantages of, for example, water stress or increased survival rates of agricultural pests and disease.

- The potential to capture more **energy** reaching the county from **renewable sources**, such as solar, wind, wave, and tidal power.

- The arrival of new and welcome additions to our native **flora and fauna** as their 'climate space' moves northward, assuming these gains are not outweighed by losses or the impact of less welcome, invasive species.

- Fewer cold-related deaths.

- Benefits for specific enterprises such as vineyards[49].

5.8 Negative Impacts of Climate Change on Kent

5.8.1 The Select Committee heard a large number of examples of negative climate change impacts which are detailed in the report *Climate Change Impacts for Kent*. Rather than repeat these here, the Select Committee would simply highlight some of the most striking negative impacts for Kent:

[49] Evidence received from Mr John Archer of the National Farmers Union at the hearing on 12 April 2006 (paragraph 4).

- The increased risk of coastal and fluvial **flooding**, arising from a combination of rising sea levels, more extreme weather leading to tidal surge and localised flash flooding, worsening the effect of the south east gradually 'sinking' due to geological change.[50]

- The prospect of 60% less summer rainfall by the 2080s – the impact of which can be imagined in the context of water shortages and **drought** orders currently across the south east[51].

- The risks to **health** from an increase in heat-related illness and death, water borne and air borne disease and breathing problems like asthma exacerbated by air quality incidents, triggered by more frequent and extreme heat-waves[52].

- The substantially increased **financial costs** of insuring and maintaining houses and other buildings in the face of increased subsidence and damage from extreme weather.[53]

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[50] See note 40 *supra*.

[51] See note 32 *supra*.

[52] Department of Health, reported in *Climate Change Impacts for Kent*, March 2006. The DoH issued a report in 2001 specifically on the health impacts of climate change in the UK. See: http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4007935&chk=aPZEuj

[53] Association of British Insurers, reported in *Climate Change Impacts for Kent*, March 2006. The ABI website has a section that specifically addresses climate change impacts on insurance: http://www.abi.org.uk/Display/default.asp?Menu_ID=1140&Menu_All=1,946,1140&Child_ID=506

- The possibility that our climate would no longer support our characteristic **wildlife** such as bluebells or the Adonis Blue butterfly, the symbol of the Kent Wildlife Trust, by the 2080s[54].

- The threat to Kent's **landscapes** and status as 'the Garden of England' as some of the traditional fruit-growing for which the County is internationally renowned could be no longer viable by the end of the century[55].

5.9 The Balance of Positive and Negative Impacts of Climate Change in Kent

5.9.1 In addition to the above, the *Climate Change Impacts in Kent*[56] report also details sector impacts in appendices to that report. Having considered all the evidence presented, the Select Committee agrees with the following conclusions:

5.9.2 The negative impacts of climate change outweigh the positive impacts in the overwhelming majority of sectors.

5.9.3 Most of the potentially positive impacts, for example developments in tourism, agriculture and opportunities for renewable energy, still require active intervention by policy makers and stakeholders.

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[54] Evidence received from Mr Richard Moyse of the Kent Wildlife Trust at the hearing on 28 April 2006 referring to the BRANCH (Biodiversity Requires Adaptations in North West Europe under a Changing Climate) and MONARCH **(**Modelling Natural Resource Responses to Climate Change) studies. (See paragraphs 4 and 9).

[55] See note 49 *supra*.

[56] See note 27 *supra.*

5.9.4 The negative impacts are so wide-ranging that every sector has a stake in reducing its' contribution to climate change and adapting to those changes that are now inevitable over the next 30 years.

5.9.5 There will be a need to avoid counter-productive adaptation to climate change – such as measures which, in seeking to respond to changing conditions, are actually likely to make them worse. For example, increased use of fossil fuels to power air-conditioning.

5.9.6 Even in sectors where positives may outweigh the negatives, such as tourism, the apparent benefits may still be transient rather than permanent, or be cancelled out by competing impacts. For example, water stress might constrain expansion of tourism.

6 Preparation for the Impact of Climate Change – Adaptation

6.1 Summary of points covered in section

- **Climate change until about the 2040s will be determined by past levels of greenhouse gas emissions, making adaptation an urgent necessity rather than a 'wait-and-see' option.**
- **The impacts of climate change will affect every KCC service directorate in different ways.**
- **Detailed study of the impacts on the full range of services currently provided by KCC is necessary as a starting point for planning adaptive responses.**
- **Water resources, flood risk and emergency planning are key areas for adaptation where the pressures of climate change are already being felt.**
- **Water resources are becoming stretched and more sustainable approaches to managing them are required, prioritising measures to reduce demand.**
- **A greater emphasis on sustainable flood risk management in addition to conventional flood defence, with efforts to reduce risk and raise awareness being a priority to help communities learn to live with flood risk.**

- **Increased flood risk raises difficult questions about the future of communities in areas already at risk, and about the scale, location and design of new development.**

- **An urgent review of Kent's emergency planning framework to take account of climate change impacts is recommended.**

6.2 Section Introduction

6.2.1 This section covers the following themes:-

- Adaptation for KCC services.
- Adaptation for the wider community.

6.3 Adaptation for KCC Services

6.3.1 Greenhouse gases[57] remain in the atmosphere for several decades – which means that even if we were able to stop the emission of carbon dioxide tomorrow, climate change for the short and medium term - through to the 2040's – has already been determined by the historic level of emissions.

[57] There are a number of naturally occurring and man-made greenhouse gases whose emission into the atmosphere contributes to global warming. Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_20) are among the main ones and while carbon dioxide is less potent than other greenhouse gases, the quantity of emissions is so large – it accounts for 85% of the UK's total emissions of greenhouse gases - that it remains the main contributor to global warming. This explains the fact that the general discourse on climate change, including in this report, tends to

6.3.2 In responding to climate change, it is vital we adapt to the predicted changes likely to happen between now and 2040. This is adaptation. It is important to also reduce emissions to minimise future climate change. This is mitigation, which is addressed in section 7.

6.3.3 Table 6.3.4 indicates the range of impacts which climate change may have on KCC services and possible adaptive responses.

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address ‘carbon dioxide’ or simply ‘carbon’ rather than ‘greenhouse gases’ as a whole. For a more detailed definition of greenhouse gases, please see the glossary. See also appendix 2.

6.3.4 **Table 6.3.4:** Summary of Climate Change Impacts on KCC Service Delivery

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
Adult Services	Increased heat stress and pollution leading to poorer air quality and an increase in related illness among vulnerable people, including breathing difficulties.	Ensure adequate shading and cooling available in places where care is delivered, increased need for treatment measures and water for re-hydrating patients/customers
	Fewer cold-related deaths but vulnerable groups still requiring care in winter	Ensure adequate provision for groups at risk from cold weather/extreme events
	Disproportionate impacts of extreme weather events on vulnerable groups. Ensuring water supply to vulnerable groups in event of standpipes being used in drought.	Assistance with costs and provision of advice associated with disruption, repairs, loss of earnings, uninsured property etc. Measures to ensure water gets to vulnerable groups in event of standpipe use.
	Increased risk of new diseases reaching UK due to warmer climate	Promote preventative measures and ensure treatments available
	Higher risk of sunburn/skin cancer due to hotter summers and outdoor lifestyles	Raise awareness of dangers, ensure shade in public areas, ‘slip/slap/slop’ sunblock campaigns
	Higher temperatures likely to increase cases of food poisoning	Raise awareness of food hygiene, revise best practice, increase resources for enforcement

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Increase in water-borne and vector-borne diseases (e.g. in care homes and hospitals)	Promote preventative measures and ensure treatments available
Children, Families and Education	Increased risk of heat-stress in educational establishments and pollution leading to poorer air quality leading to increase in related illness among children, including breathing difficulties.	Ensure adequate shading and cooling available, ensure water and other treatment measures available
	Increased risk of structural damage and disruption to school transport as well as stranded children from extreme weather	Ensure high standards of sustainable construction reflect climate change pressures and that plans for disruption due to extreme weather are in place and up-to-date
	Loss of trees and shrubs in school grounds due to drier summers	Plant drought-tolerant plants, harvest rainwater for use on site
	Schools at heart of community affected by extreme weather, flood risk, air quality etc	Raise awareness in and beyond the classroom about 'learning to live' with climate change
	Longer growing season for plants, need for year-round grass maintenance	Adapt maintenance schedules and resources and minimise energy implications thereof

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
Communities	Increased risk of flooding, drought, heatwaves and extreme weather events	Ensure emergency plans, procedures and resources in place to meet increased risk
	Increased risk of new animal and plant diseases reaching UK due to warmer climate	Promote preventative measures and ensure treatments available
	Disproportionate impacts of extreme weather events on vulnerable groups	Assistance with costs and provision of advice associated with disruption, repairs, loss of earnings, uninsured property etc
	Increased heat stress and related illness among vulnerable people	Incorporate climate related risks in 'healthy lifestyles' work
	Increased potential for outdoor lifestyles	Reflect changing recreational habits and needs in sports plans, policies and proposals
	Impacts of hotter summers and warmer winters on comfort in public buildings (e.g. libraries)	Reflect climate impacts in building specification and design
	Higher temperatures likely to increase cases of food poisoning	Ensure Kent Scientific Services prepared to cope with such trends
Property	Higher summer temperatures affect thermal comfort	Upgrade energy efficient heating and ventilation and ensure operation to maximum efficiency. Consider stating maximum working temperature for staff"

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Wetter winters cause damp, condensation and related problems	Upgrade weather-proofing systems and manage internal environment
	High risk to buildings in floodplain/coastal areas	Consider flood-proofing or relocation
	Impacts of hotter, drier summers, warmer, wetter winters, increased risk of flooding etc	Revise best practice and supplementary planning guidance according to latest evidence on climate change impacts Use thermal properties of materials to improve cooling Reduce solar heating using recessed windows, roof overhangs and shades
	Increased subsidence risk from soil shrinkage in hotter, drier summers	Plan for preventative and remedial maintenance of existing stock
	Higher risk to properties in floodplains or coastal margins	Restrict development in floodplain / instigate flood-proofing, sustainable flood management policies and raise awareness of increased risk
	Warmer temperatures affect living environment	Use thermal properties of materials to improve cooling, fit energy efficient cooling systems, preferably powered by renewable sources
	Increased risk of foundation subsidence	Promote changes to procedures and enforcement

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Longer growing season for plants, year-round grass maintenance	Adapt maintenance schedules and resources and minimise energy implications thereof
	Loss of trees and shrubs due to drier summers	Plant drought-tolerant species Harvest rainwater
	Increased problems from damp	Promote change to procedures and include measures for wetter conditions
Environment and Regeneration	Climate change impacts on quality of life	Develop climate change communications programme, segmenting audiences/messages Raise awareness in business community of risks and costs of impacts/measures to respond

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Impacts on biodiversity with a squeeze on 'climate space' for some and an expansion for others, including invasive species	Re-link and de-fragment habitats and create green corridors to help species adapt and migrate
	Increased risks/costs of maintaining historic buildings, changes to character of parks, additional water requirements of gardens	Development of new, proactive management approaches
	Waste will decay faster in higher summer temperatures	Review waste storage facilities and collection schedules
	Higher summer temperatures and higher, more intense winter rainfall may affect landfill	Review design and operation of sites to reflect climate change impacts
	Some opportunities e.g. tourism, agriculture, green technology, demand for new products	Encourage businesses to adapt to new market conditions and take advantage of opportunities

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Increased risk of flooding from sea level rise and extreme weather	Ensure statutory plans, local development frameworks, area plans and master plans address flood risk Avoid development in areas at risk Promote sustainable approach to flood risk - emphasis on 'management', less on 'defence' Insist on Sustainable Urban Drainage Systems
	Increased coastal erosion	Ensure statutory plans and local development frameworks take account of erosion Avoid developments in areas at risk
	Hotter, drier summers leading to water stress	Address long-term water supply-demand pressures in plans and when considering development proposals Ensure water demand management is prioritised in plans, policies and proposals If pursuing new resources, ensure sustainable options are promoted (e.g. take into account energy needs of schemes)
	Increased potential for outdoor lifestyles	Reflect changing recreational habits and needs in plans, policies and proposals

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Increased risk of disruption to key services (e.g. energy supply)	Reduce risk through promotion of alternatives and self-sufficiency (e.g. micro-generation from renewable sources, local food) in plans/proposals
	Increased risk of flooding, drought and extreme weather events	Promote appropriate planning and design policies in new development and adaptations for existing development
	Increase in environmental inequalities (e.g. impact of poor air quality on deprived communities)	Increase support and advice for customers Work with others to tackle problems at source
Kent Highways Services	Increase in air quality episodes exacerbated by hot weather	Ensure transport policy reduces emissions, implement air quality action plans
	Increased risk of disruption due to wetter winters (flooding) and extreme weather	Plan to flood-proof or re-site infrastructure and plan routes to minimise disruption
	Increased risk to infrastructure from flooding, sea level rise and coastal erosion	Plan to defend, re-route or abandon infrastructure
	Increased temperature causing service disruption and heat stress to public	Avoid exposed places and provide shade or cooled waiting areas
	Increased rain intensity affecting embankments, bridges, washing debris into gullies	Review maintenance of embankments and bridges, increase gully emptying

KCC SERVICE DIRECTORATE/DIVISION	POTENTIAL CLIMATE IMPACT	POSSIBLE ADAPTIVE RESPONSE
	Drier summers increase road subsidence, higher temperatures lead to surface damage	Review road structure design, implement remedial work for existing roads
	Longer growing season may lead to increase growth rates for road verges and hedges	Revise maintenance schedules, plant slower growing plants in landscaping schemes
	Warmer winters will reduce risk of frost and ice	Reduced need for gritting and road salting
	Higher levels of dust in the air	May need to hose down streets
	Wetter winters and increased rainfall intensity causing local flash flooding	Increase ditch clearing and gully emptying to remove blockages

6.3.5 Table 6.3.4 clearly shows the impact climate change could have on all KCC service directorates and what action they could take to adapt. Some of these changes are potentially catastrophic should nothing be done to counter the impact of climate change. The table is, however, simply illustrative at this stage and further study of the potential impacts for KCC is required. A co-ordinated approach is needed across all directorates for identifying and responding to climate change impacts across KCC. The Select Committee recommends that climate change adaptation becomes a mainstream consideration in KCC's service planning and delivery.

6.3.6 This means that the impacts and responses identified by further study must be reflected in future business plans of all directorates. The staff themselves should also be involved in identifying the impacts and adaptations required to help ensure that this thinking becomes mainstream.

6.3.7 In delivering services, KCC also generates significant greenhouse gas emissions. While the primary focus of the further study recommended here is adaptation, in the process of identifying impacts and adaptation responses, it would also be sensible to identify opportunities for mitigating future climate change by reducing emissions arising from the delivery of our services.

6.3.8 **Recommendation 2:** Detailed assessment of climate change Impacts on KCC services and development of adaptive responses.

The Select Committee recommends:-

1. KCC's Chief Officers Group should commission a study looking ahead to the 2020's, 2050's and 2080s to comprehensively assess the implications of climate change for all services currently delivered by KCC.

2. This study to be conducted by KCC staff and led by a cross-directorate steering group of senior officers using the UK Climate Impacts Programme recommended tools[58] to identify:
   a) Key impacts on services.
   b) Appropriate adaptive measures.
   c) Accountability for taking these measures forward.
   d) Opportunities for reducing emissions in the delivery of services.

3. These outputs to be reflected in future business plans of all directorates to ensure that climate change becomes a mainstream consideration in KCC's work.

[58] For adaptation wizard, see: http://www.ukcip.org.uk/resources/tools/adapt.asp . For Nottingham Declaration action pack, see: http://www.nottinghamddeclaration.org.uk

6.4 Adaptation for the Wider Community

6.4.1 The report *Climate Change Impacts for Kent*[59] contained at Appendix 4 details the possible impacts of climate change and the likely adaptive responses which may be required for a range of key sectors. The Select Committee endorses these assessments and encourages KCC to use them as the basis for establishing an active and ongoing dialogue with those sectors about what they can do to respond to climate change. The Select Committee also wishes to highlight three of these sectors which are of particular concern and are discussed further in this section:

- Water resources
- Flood risk
- Emergency Planning

6.4.2 In addition, air quality and energy conservation also have an adaptation impact. These issues are discussed further under mitigation in section 7.

6.5 Water Resources - the Supply Demand Balance

6.5.1 The water companies estimate that they will be able to meet Kent's overall water supply requirements up until 2010[60], with a number of local capacity and quality issues being addressed through investment. The Select Committee noted that beyond 2010-15, the industry considers that most areas will need to rely on new resources such as transfers from other areas or new reservoirs.

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[59] See note 21 *supra.*

6.5.2 The water companies have a statutory obligation to meet demand in response to growth and to promote the efficient use of water. This is the basis for the 'twin-track' approach to water resource planning – reducing demand while at the same time exploring options for increasing supply, informed by the principle that surplus water should be transferred to areas in deficit before new resources such as reservoirs are developed. A number of variables will influence the future availability of water in Kent:

- Climate change - likely to result in increased rainfall in winter, reduced rainfall in summer and increased evaporation.

- Actual levels of growth - current pressure from central government is for them to be higher than levels in the Sustainable Communities Plan.

- Changes in abstractions and the licensing regime - likely to reduce pressure as old licences are revoked.

- Implementation of water company investment plans, in themselves dependent on prices, planning consents and other criteria which beyond 2010 are less certain.

- Extent and impact of demand management measures - there are limited mechanisms for their enforcement.

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[60] *Kent and Medway Structure Plan*, *working paper 13 ("Water Supply and Waste Water Treatment")*, September 2003, paragraph 2.13.

- Impact of meeting Water Framework Directive requirements - likely to reduce the amount of water available for public water supply by placing a stronger 'ring-fence' around the amount of water required to maintain high water quality and meet environmental needs.

- Public concern for the maintenance of a healthy water environment, particularly among those who use it for recreation, angling, sailing etc.

6.5.3 The Select Committee notes that the balance of these pressures suggests that Kent could face a 'double whammy' of reduced water availability at peak periods, as a result of climate impacts and Water Framework Directive compliance, and increased underlying demand as a result of housing and related growth and the fact that demand tends to increase in hot weather at the time supply is most limited[61].

6.5.4 The risk of future short-term supply restrictions is now very real. Hosepipe bans are an accepted mechanism for water companies to introduce in times of drought[62]. The Select Committee questions if the public would tolerate standpipes. The frequency of the need for such measures is assessed by looking back at previous dry years, the '1 in 10 dry year' being used as the benchmark. However, climate change means that hindsight is becoming less reliable as an indicator of the future and there appears to be scope for taking greater account of climate change impacts in these calculations.

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[61] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy, (See Appendices for Sector by Sector impact)*. Report submitted and presented to the Select Committee by Mr Peter Moore, KCC Environment Strategy Manager, on 3 April 2006.

6.6 Water Resources - Reducing Demand for Water

6.6.1 The most sustainable way of addressing the challenge of over-stretched water resources is undoubtedly to use less. While awareness campaigns in response to the drought have recently resulted in significant reductions in demand, this is against a background of rising per capita demand for water. This suggests that awareness raising alone will be an inadequate response, and has led to a growing interest in 'demand management' – policies and practices to reduce domestic and commercial water use. The most commonly cited methods of reducing demand are:

- Water metering: experience suggests that water use is reduced by metering. Only about 20% of houses in Kent are metered[63]. The Environment Agency are now calling for 100% metering[64] across Kent.

- Water pricing: Any perception of low price for water inevitably results in inefficient use. There may be more scope for promoting tariffs which send clearer signals to users about the value of water[65] while protecting vulnerable groups.

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[62] See note 32 *supra*

[63] *Kent and Medway Structure Plan*, *working paper 13 ("Water Supply and Waste Water Treatment")*, September 2003, paragraph 2.29.

[64] See: http://www.environment-agency.gov.uk/news/1308135

[65] An example of this was noted by Members of the Select Committee on a visit to a Hillreed Homes development in Ashford on 7 July 2006 where such a scheme had been successfully introduced. KCC has also set up the Kent Water Demand Management Group, which is a partnership between planning authorities and the water industry and there is a tariff trial in Kent. See: http://www.environment-agency.gov.uk/commondata/acrobat/bulletin_75_final_1311022.pdf

- Water efficient fixtures[66]: water efficient taps, water-displacement devices for cisterns, dual flush toilets and low-flow showers are among the simple technologies which can all be installed in new and existing development.

- Waterless urinals, urinal control devices and 'restrictaflow' valves offer further potential in commercial, industrial, retail and public premises[67].

- Water efficient appliances[68]: appliances such as washing machines and dishwashers are now rated for water efficiency as well as energy efficiency.

- Water efficient gardening[69]: use of rain water collection, re-use of kitchen waste-water, drought tolerant turf, drought resilient plants, mulching mats and micro-irrigation systems can all help suppress demand, particularly during peak periods.

- Water efficient design[70]: some of the above features can be easily incorporated into new commercial and domestic development along with innovations such as permeable paving.

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[66] For further details, please see the following: http://www.kent.gov.uk/NR/rdonlyres/91ED1D20-75A7-4D84-8AD5-C264169C13AC/0/waterefficienthomes.pdf

[67] See note 66 *ibid.*

[68] See note 66 *supra*

[69] See note 66 *supra*

[70] See note 66 *supra*

- Rainwater harvesting[71]: rainwater collected from roofs and hard surfaces can be used for some domestic purposes such as toilet flushing and clothes washing through systems involving the capture, filtration, storage and plumbing into appliances.

- Grey water systems[72]: currently seen as more viable in commercial, industrial and public buildings than in households, these involve the separation of 'grey' waste water from sinks etc from 'black' waste water from toilets. The former can then be treated and re-used for toilet flushing and plant watering.

- Reduced leakage: the problem of leakage continues to be vast in scale and a cause of serious concern[73].

6.6.2 The problem with almost all of the above measures is not their effectiveness, which is largely beyond doubt, but the extent of their application. The system of water regulation funds investment to reduce leakage up to what is known as the 'economic level of leakage' - the point where spending to reduce leaks exceeds the value of water saved[74]. This might be very different from what might be considered the 'sustainable level' which would reflect the wider environmental and social costs of wasted water. The result is that the regulatory system

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[71] See note 66 *supra*

[72] See note 66 *supra*

[73] See for example the July 2006 figures from the water industry regulator, OFWAT: http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/pn2206#footnotes. See also a recent letter from OFWAT to the water companies detailing the latest position on leakages: http://www.ofwat.gov.uk/aptrix/ofwat/publish.nsf/Content/rd1106

tolerates, and effectively guarantees, high levels of leakage. Similarly, current planning law contains only limited mechanisms to ensure that, for example, all new homes maximise water efficiency, and it is therefore left to developer and consumer preference to 'opt in' to water efficiency measures above the statutory minimum.

6.6.3 While this will always be the case with some behavioural choices made by consumers, the Environment Agency estimates that technical solutions to water efficiency, if installed universally, could achieve savings of up to 25-30%.

6.6.4 It has been suggested that the voluntary approach to achieving higher standards of water efficiency, preferred by Government as set out in its Code for Sustainable Homes, may need to be strengthened in order to achieve increased water efficiency[75]. Many commercial enterprises stand to gain financially from increased water efficiency[76]. Making them aware of this potential will be important.

6.6.5 The Select Committee suggests that for Kent, the best approach may be a twin-track approach of lobbying Government for changes to ensure higher statutory standards of water efficiency, as well as developing our own standards and seeking to meet them in the interim.

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[74] See note 73 *supra*.

[75] See for example a paper for the Institute for Public Policy Research's Commission on Sustainable Development in the South East: http://www.environmenttimes.co.uk/cgi-local/newspro/viewnews.cgi?newsid1111402319,49451

6.7 Water Resources - New Sources of Supply

6.7.1 Predictions of increased winter rainfall and reduced summer rainfall as a result of climate change point to an increased emphasis on winter storage reservoirs. However, our reliance on increasing reservoir capacity to augment water supply may be restricted in future by climate change. As the experience of recent months has shown, the existence of a reservoir is no guarantee that there will be water available to fill it.

6.7.2 It also means that new reservoirs may address the medium-term dilemma of how to meet increased demand for water as a result of housing growth. This does not solve the long-term problem of reduced water availability and merely pushes it slightly further away. Measures to reduce demand to sustainable levels are more likely to work in this respect.

6.7.3 The Select Committee notes that a number of the measures identified to increase water supply in future will significantly increase the demand for energy, either because they require large scale pumping of water, such as inter-regional transfers, or because they are inherently energy intensive processes, such as desalination. If these energy needs are not met from renewable sources there is a serious concern that such measures could simply add to the problem of climate change to which they are intended to be at least in part a response.

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[76] Members of the Select Committee saw this at first hand when reviewing water efficiency measures at a new development being built by Hillreed Homes in Ashford. See also: http://www.environment-agency.gov.uk/commondata/acrobat/bulletin_75_final_1311022.pdf

6.8 Flood Risk

6.8.1 Evidence to the Select Committee was received principally from the Environment Agency[77], Mr Nick Rowe, KCC's Emergency Planning Officer[78], Mr John Archer of the National Farmers Union[79] and as written evidence from local authorities in Kent[80] and wildlife organisations[81].

6.8.2 Flooding was a particular issue raised by the public at Local Board meetings in Dartford, Thanet and Shepway when climate change was the topic for discussion[82]. An example of this included concerns raised at the Shepway Local Board meeting on 22 May 2006. Residents of Romney Marsh raised their concerns to Members of the Select Committee over possible breaches at areas such as Galloways and Jury's Gap.

6.8.3 In Kent, there are risks from both coastal and fluvial[83] flooding. Diagram 6.10.6A is an indicative[84] flood map for Kent[85]. This graphically illustrates the risk of flooding that affects many parts of Kent, such as the Thames Gateway and

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[77] See in particular note 26 *supra*

[78] Evidence received at the hearing on 26 April 2006, as well as written evidence subsequently

[79] Evidence received at the hearing on 12 April 2006.

[80] See in particular written evidence from Ashford and Tunbridge Wells Borough Councils.

[81] See in particular evidence from Mr Richard Moyse of Kent Wildlife Trust and written evidence from the RSPB and English Nature, which highlighted how wildlife habitats can depend on flooding, and are impacted by defences and how managed retreat where this occurs can create areas that are beneficial to wildlife.

[82] See section 3.2.3.

[83] Flooding associated with rivers and streams.

[84] See section 6.10.1 for a further explanation of 'indicative'.

[85] Map provided in written evidence from Mr Peter Moore, KCC Environmental Strategy Manager.

Ashford growth areas, the Wantsum Channel, the Isle of Sheppey and Romney Marsh.

6.8.4 Flood risk is increasing as a result of climate change. Rising sea levels and more extreme weather leading to storm surges, and the fact that the south east is gradually 'sinking' due to geological change[86], will increase the risk of coastal flooding. Extreme storms will also increase the risk of fluvial flooding and localised flash flooding. The Department of Trade and Industry's authoritative *Foresight Future* flooding report[87] on flooding suggests that without action to reduce emissions, by the 2080s:

- The costs of flooding could rise from £1 billion per annum today to £27 billion
- Damage from coastal erosion could increase by 3-9 times.
- The number of people at high risk of flooding in the UK could rise from 1.6 million today to 2.3-3.6 million.

6.8.5 If the proportion of these changes were reflected in Kent, the impacts would be massive. In addition, there is a significant overlap between areas at risk of flooding and areas of deprivation in Kent, based on benefit claimant rate[88]. A

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[86] See note 40 *supra*.

[87] See: http://www.environment-agency.gov.uk/subjects/flood/763964/?version=1&lang=_e

[88] Map provided in written evidence from the KCC Supporting Independence Programme showing all benefit claim rates by ward area in Kent. When compared to the indicative flood risk map for Kent, the Select Committee noted that areas with the highest % working age population claiming benefits are in some cases also in flood risk area.

large proportion of the population in deprived communities may require special assistance in the event of flooding. Memories of Hurricane Katrina and its impact on New Orleans in the United States of America in 2005 vividly illustrate this scenario.

6.8.6 Flood risk is not simply an issue for the built environment. While the National Farmers Union noted that farmers are happy to farm on flood plains, it was added that they would want to see measures in place to deal with any losses that may occur in the event of flooding. In addition, farmers, particularly in parts of North and East Kent near the coasts, are also concerned about saltwater intrusion into freshwater ground supplies that they use. The risk of this is predicted to increase with climate change[89].

6.9 Flood Risk – Flood Defence Versus Flood Management

6.9.1 Historically, the approach to flood defence has been based on resisting natural forces through heavy engineering[90]. Climate change means that such approaches will become increasingly unsustainable, both economically and environmentally. The rising costs of defence will be too high to be borne by coastal communities alone, while there will be a limit to the extent to which general taxation will foot the bill. Inter-tidal habitats such as mudflats and saltmarsh will also be squeezed as rising sea levels push them against hard defences. The result could be that many of the internationally designated sites

[89] Evidence received from Mr John Archer of the National Farmers Union at the hearing on 12 April 2006 (paragraphs 4 and 9).

[90] For further information, please see the Environment Agency's website: http://www.environment-agency.gov.uk/subjects/flood/1217883/1217968/1218048/?lang=_e

which ring the Kent coast could be threatened or lost altogether unless we change our approach to managing flood risk.

6.9.2 *Making Space for Water*[91], the title of a major government policy document published in 2004, hinted at the principles behind its preferred policy for coastal erosion and flood management. This approach, presaging a major shift in emphasis from flood defence to flood management, is being followed through by the Environment Agency. This means using more 'soft' defences, working more with nature rather than against it, allowing flood plains to perform their natural function and, is some cases, ceding land to the sea to reduce flood risk elsewhere, known as managed realignment. It is generally said that Kent has limited opportunities for managed realignment[92], and while geography and the developed coastline are certainly limiting factors, it may be that options currently regarded as politically or practically undesirable will have to be considered as climate change impacts increase.

6.9.3 The Select Committee notes that if we recognise that an increase in flood risk is inevitable, and that we will not always be able to afford to defend against it, there are two important implications for Kent. First, we will have to learn to live with increased flood risk, and KCC will have a major role to play in helping communities understand the risks and prepare for them to minimise the social and economic costs of inevitable flooding. Alternatively, and in the longer-term, it

[91] *Making Space for Water: Taking forward a new Government strategy for flood & coastal risk management.* Published by DEFRA. See: http://www.defra.gov.uk/environ/fcd/policy/strategy.htm

[92] See for example the limited opportunities for managed realignment in the Shoreline Management Plans covering Kent's coast: http://www.se-coastalgroup.org.uk/

may be that some parts of some communities may have to relocate. The Select Committee believes that KCC has a key role in leading such debates. The Select Committee is also concerned that the reality of the impact of climate change should not be denied by any who may be intent on attracting large-scale commercial and housing development to areas for which climate change will bring an unacceptably high risk of flooding.

6.10 Flood Risk - Flood Risk and Planning

6.10.1 The indicative flood risk map of Kent expresses flood risk before the impact of defences is taken into account. Much of the North Kent coast is, of course, defended to a high standard of about 1:1000 - e.g. from the Thames Barrier to the Isle of Grain. East of this, some areas are defended to a lower standard while the condition of defences in other areas remains unknown. The Select Committee notes that flood defence to a 1:1000 year standard does not mean that the area 'will not flood for a thousand years' - rather, it means that over the course of 1,000 years, the area would only be expected to flood once. This one flood could, however, still be catastrophic, and could still happen any time. This raises major questions about locating large scale new development and strategic assets in areas facing high flood risk.

6.10.2 Central government has strengthened planning guidance to reduce flood risk in new development and ensure that it does not increase flood risk elsewhere[93]. It strengthens the requirements for Flood Risk Assessments to accompany

[93] See DEFRA news release on 'Strengthened planning policy for flood risk areas': http://www.communities.gov.uk/index.asp?id=1002882&PressNoticeID=1852

planning applications, includes a sequential test to ensure that low risk sites are considered before high risk sites, and includes measures to increase the flood resilience of new development. The Select Committee welcomes this and urges KCC to work closely with the Environment Agency and district councils to ensure that this guidance is observed in planning decisions.

6.10.3 The issue of flood risk has drawn particular attention in the Thames Gateway, where the insurance industry[94] and Environment Agency[95] among others have expressed concern as part of a campaign to ensure that the most at risk areas are avoided and adequate steps are taken to defend against floods where development does go ahead. While concentrating development on sites facing lower risk is clearly a sensible adaptation, the Select Committee is concerned that there may be occasions where this would conflict with the sequential test to develop brownfield sites before greenfield, and also with the need to reduce emissions arising from new development[96].

6.10.4 For example, flood risk could be reduced by building on greenfield sites on higher ground, but if those sites are poorly connected by public transport and reinforce car dependency, require removal of vegetation and need additional infrastructure

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[94] The Association of the British Insurance Industry ("ABI") has prepared a specific report: http://www.abi.org.uk/Display/default.asp?Menu_ID=1140&Menu_All=946,1140,0&Child_ID=480

[95] See: http://www.environment-agency.gov.uk/business/444304/502508/1188512/1189198/ and page 10 of the document "The Climate is Changing, Time to Get Ready": http://www.environment-agency.gov.uk/commondata/acrobat/ea_cc_eng.2_1057452.pdf

[96] These policies are indicated in the Kent and Medway Structure Plan ("KMSP"). The KMSP was adopted in July 2006. Chapter 9 (p 57 *et seq)* considers climate change issues specifically, although policies elsewhere in the KMSP are also relevant.
See: http://www.kmsp.org.uk/pdfs/KMSPAdoptedPolsKDJul06.pdf

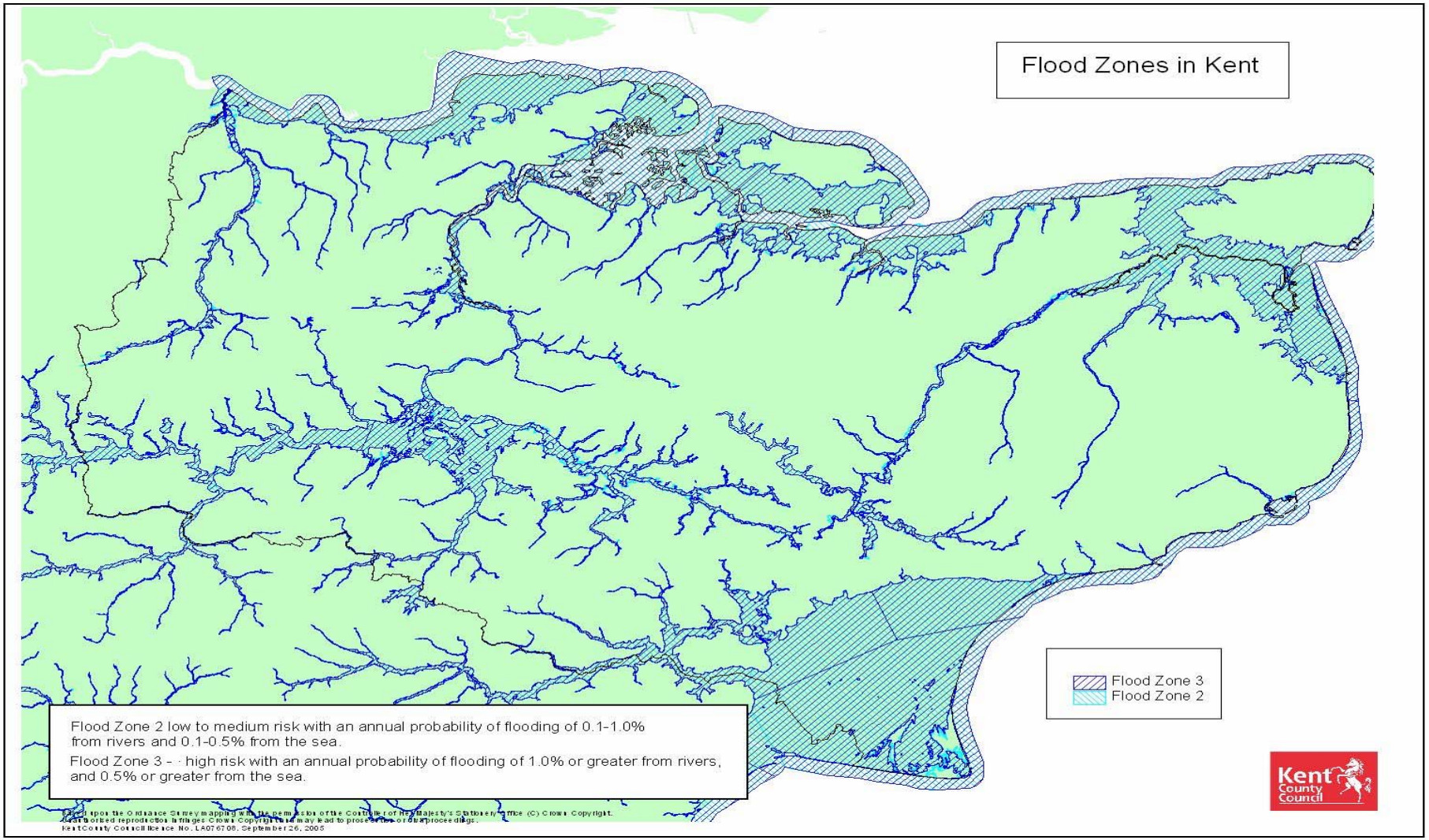
to service them, the result will be a substantial increase in emissions. Flood risk for the individual development will have been addressed in the short-term, but flood risk for society as a whole, and existing development which remains in the ever-rising flood plain, in the long-term will not have been. Prioritising well-defended brownfield sites, which tend to be defended anyway because their previous uses required it, and building at higher densities on them would help minimise these potential conflicts.

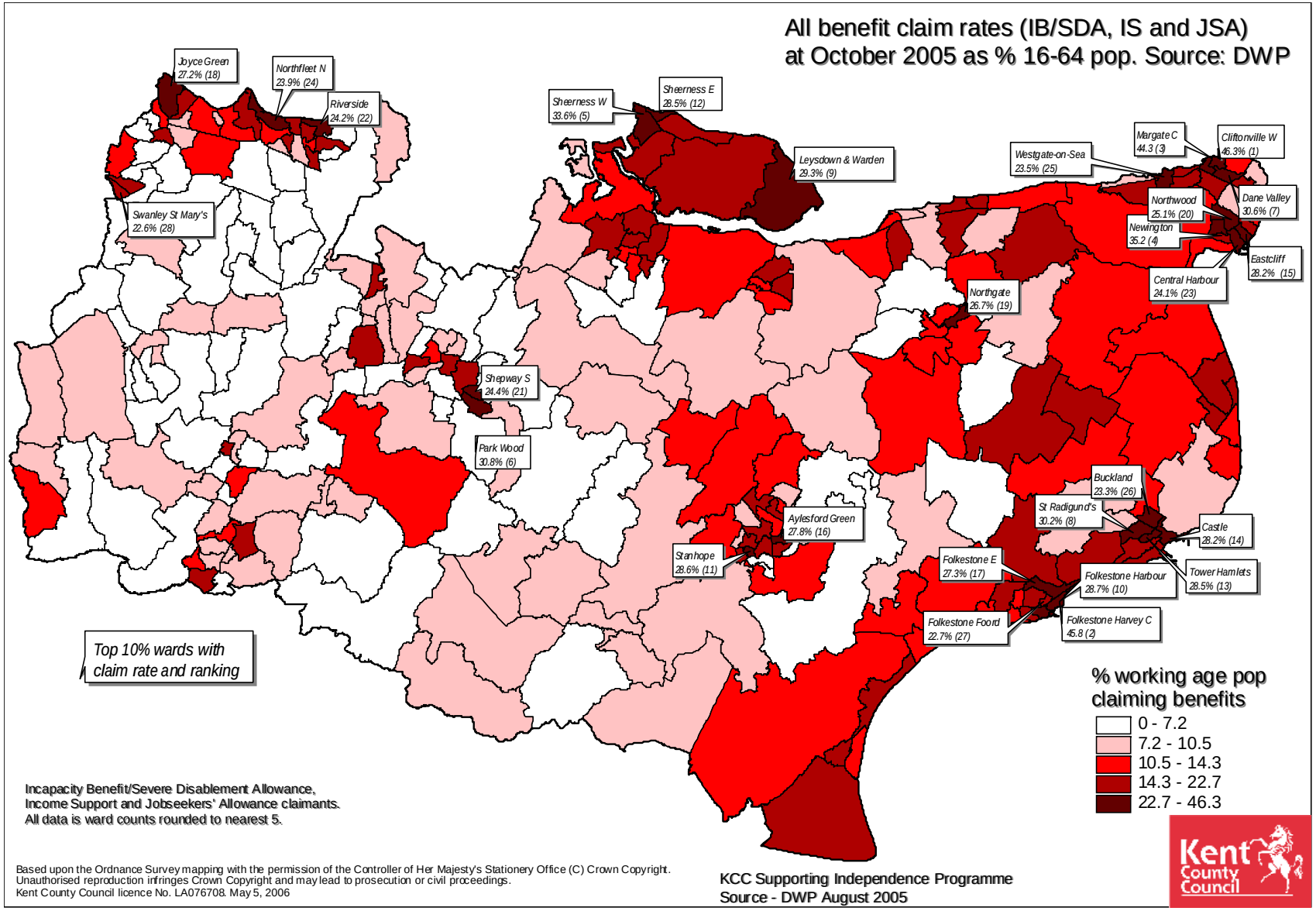
6.10.5 When considering flood risk and new development, planners clearly need to set a point in time against which to calculate flood risk. For example, the working assumption on flood risk in the Kent Thameside part of the Thames Gateway is of a 1:1000 in 2030[97]. Given predictions of accelerated climate change later in the century, and as it is envisaged the buildings now being erected lasting beyond 2030, it may be that we should be seeking to assess flood risk closer to the end of the lifetime of a development. The forthcoming 'probabilistic' scenarios promised by the UK Climate Impacts Programme, which will express the likelihood of climate impacts as a probability for a given point in time, may provide a more robust basis for taking this longer term view[98].

6.10.6 **Diagrams 6.10.6A** – Indicative Flood Map of Kent and **6.10.6B** – All Benefit Claim Rates at October 2005 as a % 16-64 Population.

[97] Written evidence received from Peter Moore, KCC Environment Strategy Manager.

[98] See: http://www.ukcip.org.uk/scenarios/ukcipnext/what_is_ukcipnext.asp


Flood Zones in Kent
Flood Zone 3
Flood Zone 2
Flood Zone 2 low to medium risk with an annual probability of flooding of 0.1-1.0% from rivers and 0.1-0.5% from the sea.
Flood Zone 3 - high risk with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.
Kent County Council


All benefit claim rates (IB/SDA, IS and JSA)
at October 2005 as % 16-64 pop. Source: DWP
Joyce Green
27.2% (18)
Northfleet N
23.9% (24)
Riverside
24.2% (22)
Swanley St Mary's
22.6% (28)
Sheerness W
33.6% (5)
Sheerness E
28.5% (12)
Leysdown & Warden
29.3% (9)
Westgate-on-Sea
23.5% (25)
Margate C
44.3 (3)
Cliftonville W
46.3% (1)
Dane Valley
30.6% (7)
Northwood
25.1% (20)
Newington
35.2 (4)
Eastcliff
28.2% (15)
Central Harbour
24.1% (23)
Northgate
26.7% (19)
Shepway S
24.4% (21)
Park Wood
30.8% (6)
Buckland
23.3% (26)
St Radigund's
30.2% (8)
Castle
28.2% (14)
Aylesford Green
27.8% (16)
Stanhope
28.6% (11)
Folkestone E
27.3% (17)
Folkestone Harbour
28.7% (10)
Tower Hamlets
28.5% (13)
Folkestone Foord
22.7% (27)
Folkestone Harvey C
45.8 (2)
Top 10% wards with
claim rate and ranking
% working age pop
claiming benefits
0 - 7.2
7.2 - 10.5
10.5 - 14.3
14.3 - 22.7
22.7 - 46.3
Incapacity Benefit/Severe Disablement Allowance,
Income Support and Jobseekers' Allowance claimants.
All data is ward counts rounded to nearest 5.
Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office (C) Crown Copyright.
Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.
Kent County Council licence No. LA076708. May 5, 2006
KCC Supporting Independence Programme
Source - DWP August 2005
Kent
County
Council

6.10.7 Flooding was the subject of a Select Committee review topic in 2001 and the 2005 Select Committee topic review entitled *"Water and Wastewater, Particularly in Ashford*" considered it necessary to look at flooding as part the water systems considered in that report[99]. This report also commented on the use of Sustainable Urban Drainage Systems ("SUDS")[100] and the Select Committee also received further written evidence on SUDS from Eddy Taylor of Croydon Borough Council. SUDS can be considered a sustainable measure to address the impact of climate change. While the Select Committee welcomes reference to SUDS in the Kent Design guide and other policy documents, it would like to be reassured that rather than simply being 'encouraged' by local planning authorities, it is actually being 'insisted' upon in all possible circumstances.

6.11 Emergency Planning

6.11.1 The Select Committee investigated how climate change could impact on emergency planning. KCC has an Emergency Planning Unit[101] which draws up, maintains and reviews arrangements for dealing with major incidents. It co-ordinates responses across the council, and works closely with the county's emergency services and 12 district councils to ensure that the right people with the right skills are well-briefed and ready to react.

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[99] See the "Water and Wastewater, Particularly in Ashford" Select Committee report, September 2005, Page 53. See: http://www.kent.gov.uk/publications/council-and-democracy/selectcom-water-sep05.htm

[100] For a further explanation of SUDS, please see the Glossary.

[101] See: http://www.kent.gov.uk/Community/community-safety/emergency-planning/

6.11.2 Given that both the probability and severity of extreme weather events are predicted to increase because of the impact of climate change[102], the Select Committee regards it as vital that potential climate related disasters are adequately considered in the emergency planning framework. The Select Committee is concerned that this point is not being adequately considered.

6.11.3 While flooding and water shortages addressed elsewhere in this section are among the most visible potential emergencies which might be addressed by Kent's emergency planning framework, the Select Committee would emphasise that they are not the only ones. For example, planning to protect vulnerable people in the event of more severe and frequent heatwaves might be considered in a similar context. This said, the comments below focus on emergency planning for flood risk as this is the area where the evidence was most forthcoming.

6.11.4 The Select Committee noted that the Environment Agency and KCC's Emergency Planning Unit wish to complete a plan for the evacuation of Romney Marsh in the event of large-scale flooding[103]. This requires support from a number of organisations to be completed. Mr Nick Rowe, KCC's Emergency Planning Officer, also submitted written evidence that as coastal flooding has been identified as a priority risk in the Kent Community Risk Register,[104] it may now be possible to complete the project. Given the points above on the impact

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[102] See the UKCIP02 scenarios (page 3 *et seq)*: http://www.ukcip.org.uk/resources/publications/documents/UKCIP02_briefing.pdf

[103] See evidence from Mr Neill Gunn of the Environment Agency at the hearing on 28 April 2006, paragraph 9 and written evidence from Mr Nick Rowe.

of climate change and flooding and the concerns about flooding raised by members of the public at the local board meeting in Romney Marsh referred to in section 6.8.2, the Select Committee calls on all parties to deliver this project as a matter of urgency. We would also encourage a more thorough review of how climate impacts are taken into account in the wider emergency planning framework which might result in further, similar projects being taken forward.

6.11.5 **Recommendation 3**: Ensure climate change impacts on flood risk, water resources and emergency planning are taken into account.

The Select Committee recommends that KCC should:-

1. Strongly support the Environment Agency's efforts to promote sustainable approaches to flood risk management, to restrict building in areas at high risk of flooding and to ensure that flood resilience is built in to new development.

2. Ensure that where development in the indicative flood plain goes ahead it is concentrated in well-defended areas at higher densities.

3. Ensure that development pressure is not simply transferred from high flood risk areas to lower risk areas which may face other constraints, climate-related or otherwise.

4. Adopt a new statement of water policy, emphasising the importance of demand management and reflecting current concerns about water resources and long-term concerns about climate change impacts.

[104] See: http://www.kent.gov.uk/publications/community-and-living/kent-community-risk-register.htm

5. Immediately review Kent's emergency planning framework to ensure that the latest evidence on climate change is fully taken into account.

6. Call a high level meeting of the emergency services, local authorities and the Environment Agency to identify potential climate related emergencies and ensure that they are being adequately planned for.

7. Ensure that specific emergency plans for climate related emergencies, such as evacuation plans for those areas of Kent facing high flood risk, are in existence and up to date.

7 Reducing the Risk of Future Climate Change – Mitigation

7.1 Summary of points covered in section

- **Kent's carbon footprint is significant and substantially reducing it is fundamental to reducing the risks of future climate change.**

- **Energy, transport and land use planning are key areas where KCC can influence Kent's carbon footprint.**

ENERGY

- **Energy efficiency measures offer the quickest and cheapest way to reduce emissions, though promotion of a mix of renewable and other low-carbon sources of energy, particularly at a small scale, is also essential. There are existing sources of free, independent energy advice in Kent which should be more strongly supported and promoted by KCC.**

- **KCC must lead by example, using sustainably-sourced biofuels in its vehicle fleet, committing to high standards of sustainable construction and operation for its buildings and setting ambitious targets for carbon reduction and renewable energy use.**

- **The impact of schools on emissions has a major practical and symbolic significance as they make up a large part of KCC's estate. Reducing emissions associated with schools, via support for the Eco-Schools programme and other initiatives, should be a priority.**

TRANSPORT

- **Transport is the fastest growing source of carbon dioxide emissions but current transport policies – national and local – are inadequate to prevent rising emissions.**

- **A new focus on reducing emissions, promoting schemes and policies which will achieve this and avoiding those which will not, is necessary to mount an effective challenge to climate change.**

- **KCC can lead by example by increasing staff commuting by sustainable modes, setting targets to reduce business mileage, and promoting low-emission vehicles via its lease car scheme.**

LAND USE AND PLANNING

- **The South East Plan will have a major impact on greenhouse gas emissions in Kent. KCC's efforts to influence the plan should seek to minimise emissions by focussing on the volume of development facing Kent and standards of sustainable construction.**

- **The Local Development Frameworks being developed by Kent's district councils provide major opportunities to tackle climate change. KCC should work with them to ensure that they make efficient use of land, reinforce high standards of sustainable construction and improve and extend natural habitats both to help wildlife adapt and to act as carbon 'sinks' (see Glossary for definition).**

- **KCC can lead by example by ensuring that it advocates and applies these principles in its own development control and planning functions.**

7.2 Section Introduction

7.2.1 This section covers the following themes:

- Kent's carbon footprint and reducing emissions.
- The case for targets to reduce emissions.
- Mitigation within KCC's estate.
- Mitigation for Kent as a whole.

7.3 Kent's Carbon Footprint and Reducing Carbon Emissions

7.3.1 Reducing the risks of future climate change fundamentally depends on reducing carbon dioxide emissions. To assess the scope of this challenge, the Select Committee agreed it would be useful to identify Kent's "carbon footprint".

7.3.2 The national emissions inventory indicates that 12,628,000 tonnes of carbon dioxide were emitted in Kent in 2003. This represents Kent's 'carbon footprint' for the most recent data available. The main sources of emissions are industrial and commercial (42%), domestic (29.5%), road transport (26.5%) and land use

change (2%). Table 7.3.3 details carbon dioxide emissions for each local authority area in Kent[105].

7.3.3 **Table 7.3.3:** Carbon Dioxide Emissions by Local Authority Area in Kent

Local Authority Area	Total Emissions (kt 2003)	Population ('000s)	Per Capita (Tonnes Per Person 2003)
Ashford	997	106	9.41
Canterbury	914	140	6.71
Dartford	940	86	10.93
Dover	890	105	8.48
Gravesham	1,574	95	16.57
Maidstone	1,251	142	8.81
Sevenoaks	1,011	110	9.19
Shepway	920	98	9.39
Swale	1,446	125	11.57
Thanet	775	128	6.05
Tonbridge and Malling	1,127	110	10.25
Tunbridge Wells	783	105	7.46
Medway	1,833	251	7.30
KENT TOTAL (excluding Medway)	**12,628**	**1,350**	**9.35**
KENT TOTAL (including Medway)	**15,244**	**1,601**	**9.52**

[105] Source: produced on behalf of DEFRA by the National Environmental Technolgy Centre ("Netcen"), (see http://www.netcen.co.uk/index.php) as part of the National Atmospheric Emissions Inventory. The data is compiled using national spatial data and attempts to locate emissions where they occur but excludes domestic aviation, shipping and the off-shore oil industry, which can not be easily allocated to local authority areas. The data do not estimate emissions resulting from the production or transportation of materials or consumables unless the production or transportation occurs with in the defined area boundary. If used as indicators, e.g. by dividing the total or sub totals by the population or GDP, some misleading results can occur due to the over simplification of the emissions allocations and the lack of local knowledge.

Local Authority Area	Total Emissions (kt 2003)	Population ('000s)	Per Capita (Tonnes Per Person 2003)
SOUTH EAST TOTAL	**71,144**	**8,081**	**8.80**
UK TOTAL	**568,105**	**59,537**	**9.54**

7.3.4 Table 7.3.3 demonstrates Kent's emissions are above the south-east regional average on a per capita basis but broadly in line with the national average. Kent is, however, one of the largest and most populous counties in the UK, so our absolute level of emissions - our contribution to climate change - is highly significant in both the regional and national context. The Select Committee concludes that this demonstrates why KCC must play a pivotal strategic role in reducing carbon emissions. The following sections highlight those areas which have a major influence on emissions, and where the Select Committee felt KCC could exert the greatest influence in terms of reducing emissions: energy, transport, land-use and planning.

7.4 Energy

7.4.1 All methods of generating energy - even renewable technologies such as solar panels and windmills - bring some environmental cost and emissions of carbon dioxide, if not during use, then due to manufacture, maintenance or the creation of infrastructure.

7.4.2 For this reason, the most cost-effective and sustainable method of reducing carbon dioxide emissions is to encourage Kent's businesses and residents to reduce energy use across the board.

7.5 Energy Services

7.5.1 The Select Committee received evidence from Creative Environmental Networks ("CEN") that energy efficiency is a quick, cheap and most effective means of reducing carbon emissions in both the domestic and commercial sector[106]. The Select Committee observes that these sectors together account for 71.5% (or 9,029,000 tonnes) of all the carbon emissions in Kent (see section 7.3.2), so any measures targeted here will have a real impact.

7.5.2 The Select Committee noted some barriers to delivering energy efficiency measures[107]. Although proven technologies such as loft insulation and cavity wall insulation are readily available, they are not being applied widely enough, due in part to:

- Lack of awareness for many Kent residents as to costs and benefits.
- Lack of impartial advice and support, or lack of awareness of the fact that it is available.
- Lack of resources to put widespread energy efficiency measures into practice.

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[106] See evidence received from Ms Wendy Goddard of CEN at the hearing on 28 April 2006 (paragraphs 2 *et seq)*. The Select Committee also received evidence on a visit to see renewable technologies in action that was organised by CEN on 10 May 2006. The Select Committee also received evidence on energy efficiency within KCC from Mr Andy Morgan, KCC Commercial Services LASER Energy Manager, at the hearing on 15 May 2006 (paragraph 17 *et seq)*.

[107] See note 106 *ibid*.

7.5.3 The Select Committee identified energy efficiency as a key area for KCC to play a leading role in ensuring Kent residents can mitigate the impact of climate change. The Select Committee observes that KCC is well-placed to assist in overcoming the barriers using its own services, resources and partnership influence.

7.5.4 The Select Committee suggests that examples of this include:

7.5.5 Using its communications infrastructure to raise public awareness and to educate Kent's residents on how they can take energy efficiency measures to mitigate the impact of climate change. (See section 8.5).

7.5.6 Working with others in a community leadership role to develop and promote energy advice – see for example evidence from Miss Becky Ribbens in section 8.7 and public feedback in Appendix 1.

7.5.7 **Recommendation 4:** Provide support for better sustainable energy advice to Kent's residents

The Select Committee recommends KCC:-

1. Offer funding to energy advice centres such as Creative Environmental Networks ("CEN") to extend promotion and delivery of their free energy advice service and the projects indicated below.

2. Endorse and advertise this service prominently and aggressively through KCC publications and the kent.gov.uk website.

3. In conjunction with the project provider, consider creating a specific fund

for the retro-fitting of domestic energy efficiency measures to achieve carbon dioxide emission reductions, with the wider aim of promoting the impacts of climate change.

4. Partner with the Kent ECO-Schools team and other stakeholders to produce a county-wide "school pack" on climate change[108].

7.6 Renewable and Low-Carbon Sources of Energy

7.6.1 After reducing energy use, the next most effective way of reducing carbon emissions is to make greater use of renewable and low-carbon sources of energy. Kent now has targets for generating renewable energy set via the regional planning process which the Select Committee is happy to endorse[109]. We do start, however, from a very low base, so the scale of this challenge, and the need for proactive approach to meeting those targets, should not be under-estimated. Kent's local authorities, businesses and residents all have a part to play.

7.6.2 The Select Committee does not wish to rehearse the pros and cons of all the renewable energy technologies available. This said, the Select Committee heard evidence to suggest that the issue of biomass in Kent is worth further exploration.

[108] This should be similar to the packs produced by Croydon Borough Council in their schools in conjunction with CEN. Written evidence received from Croydon Borough Council following the hearing on 10 April 2006.

[109] See figures cited in *Kent Environment Strategy: 2005 Progress Report, p18*, KCC March 2005. This document can be found at: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

This is addressed in more detail in section 7.7. Beyond this, the Select Committee would simply note that our success in mitigating climate change is likely to be greater if we:

- develop a mix of renewable energy technologies - Kent is fortunate in having a large renewable energy potential in the form of wind, solar, biomass, wave and tidal power. Wind, biomass and solar appear to offer the best short term prospects but other options should not be ruled out, particularly as climate change may ironically increase the potential of all the sources mentioned.

- Seek to apply them at a smaller scale - so called 'micro-generation'. This is because some of the inefficiency in our current patterns of energy use arises from a highly centralised generation and distribution process. If this can be addressed through greater use of community scale renewables, domestic installations and the like, then it will help achieve greater security of supply and may address public concerns about larger scale renewable energy developments, as well as tackling climate change.

7.7 Biomass

7.7.1 The Select Committee heard evidence that the economics of different renewable technologies will clearly be influenced by the extent of their application. Some renewable sources of energy may be held back not because they are inherently expensive, but because the market for them needs to be ‘kick-started’ to create the necessary supply chain. This appears to be the case with biomass in Kent

with wood fuel being cheap and readily available, but lacking a mature supply chain to match it to potential demand[110].

7.7.2 This is more likely to happen if KCC or other large organisations were to create a significant corporate demand for a given technology. Evidence was presented to the Select Committee that this could be the case with biomass energy from coppiced woodland[111], of which there is currently an excess of supply over demand in Kent.

7.7.3 The Select Committee strongly believes that further research is necessary to understand the true potential and limitations of the market for biomass in Kent. KCC should also explore the potential for using biomass heating across KCC's estate with a view to installing biomass boilers at suitable sites.

7.7.4 In addition to creating a local supply chain, this would have the added benefit of insulating KCC against rising fossil fuel prices and for the wider community of supporting the coppice industry and the livelihoods, amenity and biodiversity which depend on it. Biomass could be particularly appropriate for high heat users such as care homes, as the greatest efficiencies can be generated when it is operating continually and at maximum capacity[112].

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[110] Evidence received from Ms Wendy Goddard of Creative Environment Networks at the hearing on 28 April 2006 (paragraph 5) and during the Members visit on 10 May 2006 to various projects organised by CEN, Mr John Archer of the National Farmers Union at the hearing on 12 April 2006 (paragraph 8) and Mr Laurence Tricker, KCC Countryside Partnerships Manager at the hearing on 10 April 2006 (paragraph 10).

[111] See note 110 *ibid.*

[112] Evidence received from Mr John Thorp of the Energy Conservation and Solar Centre (paragraphs 6, 7 and 19).

7.7.5 In assessing feasibility, however, it is vital that the connection to *local* sources of wood fuel is maintained and that care is taken to ensure that carbon savings anticipated from reliance on biomass exceed any carbon emissions generated in the production and distribution process.

7.7.6 As noted in section 7.12.4, the Select Committee believes that there is also great potential for the use of bio-fuel and bio-diesel in KCC where this can be procured from sustainably managed sources. For this reason, the Select Committee includes a recommendation on bio-fuels.

7.7.7 **Recommendation 5:** Complete a feasibility study for use of Biomass in KCC Buildings and replace conventional fuels with Bio-Fuels in KCC vehicles where possible.

The Select Committee recommends KCC:-

1. Undertake feasibility studies for the use of locally-produced biomass across the KCC estate, including schools, care homes and all new build sites.

2. Use Bio-ethanol or Bio-diesel from certified, sustainable sources to fuel its own fleet of vehicles where possible.

3. Consider installing wood-chip or wood-pellet biomass boilers where oil-fired boilers are due for replacement and infrastructure and space can be available for fuel delivery and storage.

7.8 Reducing Emissions and Energy Consumption Within KCC

7.8.1 As discussed in sections 7.3 and 8.4, reducing carbon emissions is key to mitigating the impact of climate change. There are a number of pragmatic measures which should help KCC reduce its carbon footprint.

7.8.2 The Select Committee received written evidence from Mr Andy Morgan, Energy Manager in KCC Commercial Services' LASER division estimating that 162,129 tonnes of carbon dioxide were emitted by KCC in 2005. This is indicated in Table 7.8.3. This represents KCC's 'carbon footprint' for the most recent data available. As can be seen, 99.7% of KCC's emissions come from 4 areas - KCC Buildings (47%), KCC Staff Commuting Miles (37%), Street Lighting (11%) and KCC Staff Business Miles (4%).

7.8.3 **Table 7.8.3:** Estimated carbon dioxide emissions by KCC in 2005[113].

Area	Total emissions (Tonnes in 2005)	Percentage of total emissions
Buildings	76,396	47.1%
Streetlighting	17,619	10.9%
Staff Business Miles	6,539	4.0%
Staff Commuter Miles	61,150	37.7%
Waste	425	0.3%
TOTAL	**162,129**	**100.0%**

[113] Source: KCC Carbon Management Programme. Assumptions: Commuter mileage based on County Hall Carbon dioxide emissions average staff mileage a week was 151 miles 6,795 miles a year with a staff total of 30,698. Using same ratio as County Hall staff, we get 208,592,910 miles which is equal to 61,150 tonnes. Assumed petrol car averages 35mpg. 2/3rds of staff work in Education (20,971 staff). Business miles includes fleet and business miles and air miles. Streetlighting based on KCC inventory, not consumption.

7.8.4 The Select Committee noted the work undertaken by KCC's Corporate Environment Performance Group and evidence contained in KCC's Corporate Environmental Performance Report 2004-2005[114]. This details progress and proposes a target of 15% reduction in carbon emissions from its own buildings by 2015 and other activities. In addition, the Select Committee further noted evidence of an Energy Loan Fund Scheme, which is used to invest in appropriate energy savings projects. This £300,000 fund is managed by a team within KCC Commercial Services' LASER division. The Select Committee also noted the production of KCC's Carbon Reduction Plan and the action it proposes to meet these targets[115]. The Select Committee applauds this, but notes that more needs to be done given Kent is atypical in the impact of climate change and its needs. KCC should therefore look to adopt more challenging targets as detailed in Table 8.4.8.

7.8.5 The Select Committee also noted evidence that the Building Schools for the Future ("BSF") Programme requires a minimum standard of "Very Good" under the Building Research Establishment Environmental Assessment Method (BREEAM)[116] and that Part L of the Building Regulations were re-issued in April

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[114] See: http://www.kent.gov.uk/publications/environment/cep-report-2005.htm. Evidence also received from Ms Carolyn McKenzie, KCC Kent Sustainable Business Partnership Co-ordinator at the hearing on 15 May 2006 (paragraph 1 *et seq)*.

[115] See note 114 *ibid.*

[116] The most widely recognised and used measure of environmental design and management in the construction and property sectors, and increasingly specified in public sector procurement as a minimum standard.

2006, which require new buildings to meet a 25% improvement in energy efficiency. Clearly, these will have an impact in reducing KCC's emissions[117].

7.8.6 The Select Committee was pleased to note that 46% of the electricity used in KCC's own estate came from renewable sources[118]. However, the Select Committee has subsequently received evidence that from November 2006, this will drop to 0%. The Select Committee understands that changes in the market for energy have currently increased the price of renewable energy to the extent that such contracts are currently considered uneconomic by KCC[119]. The Select Committee also understands that there are concerns about whether the electricity sold under 'green' tariffs delivers any real increase in renewable generation or reductions in carbon dioxide emissions and that some such tariffs may be little more than symbolic[120]. Whilst the Select Committee would not underestimate the importance of symbolism in this area, clearly there are limits to the extent to which KCC could pay for symbolism if there were no clear environmental benefit. This said, if we are to tackle climate change effectively, it may be necessary to pay something extra for our electricity, reassured by the knowledge that that this would also encourage us to use less of it.

7.8.7 The Select Committee suggests that it is important to know about the relative costs in terms of both price and carbon dioxide emissions of the options available

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[117] Evidence from Mr Mike Austerberry, KCC Director of Property and Mr Steve Bell, KCC Professional Services Manager, Property Group at the hearing on 28 April 2006 (paragraph 5).

[118] See note 114 *supra*.

[119] Written evidence from Mr Andy Morgan, Commercial Services LASER Energy Manager.

[120] For example, please see: http://www.ethicalconsumer.org/magazine/buyers/electricity.pdf and http://www.foe.co.uk/resource/briefing_notes/green_electricity_tariffs.pdf

for KCC's electricity supply contract so that the next time it comes up for renewal, climate change considerations can be taken into account. If KCC has selected a tariff which delivers the same or better performance in terms of emissions for a lower cost then that would clearly be sensible. Either way, the Select Committee would urge KCC to commit to ambitious targets for carbon reduction and for the proportion of its energy coming from renewable sources as suggested in Table 8.4.8. This could be achieved both by procuring an appropriate tariff in future, and by greater reliance on renewable energy generation within KCC's estate which is addressed in the following section.

7.9 The Use of Renewables in KCC's Estate and ECO-Schools Initiative.

7.9.1 81% of energy consumed by KCC is used in schools[121] and 47% of carbon emissions are in KCC buildings[122]. Taking these figures against a backdrop of Government expectation that local authorities adopt targets for energy generation from renewable energy[123], the Select Committee identified potential for micro-renewables in KCC's Estate. This is especially with programs such as Building Schools for the Future (see section 7.8.5) as well as other initiatives, such as Private Finance Initiative projects generally.

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[121] Evidence received from Mr Mike Austerberry, KCC Director of Property at the hearing on 28 April 2006 (paragraph 3) and Ms Carolyn McKenzie, KCC Kent Sustainable Business Partnership Co-ordinator at the hearing on 15 May 2006 (paragraph 9).

[122] See Table 7.8.3.

[123] "The Government expects all planning authorities to include policies in their development plans that require a percentage of the energy in new developments to come from on-site renewables, where it is viable". DLCG statement on PPS22 dated 8 June 2006. See:

7.9.2 The Select Committee urges KCC to take full advantage of opportunities in this area and to consider active policy intervention to ensure that measures to reduce emissions and support renewables are incorporated in Directorate plans or designs, with the KCC Property Group being given sufficient powers to ensure that this is enforced. Although the Select Committee accepts that the costs of achieving the BREEAM 'Excellent' standard may be relatively high at present, the Select Committee still believes KCC should commit to a clear timetable for meeting that standard, including in the school building programme[124].

7.9.3 The Select Committee was fortunate enough to visit a number of locations in Kent, including village halls, private houses and tourist attractions, where a range of renewable energy technologies have been installed or were in the process of being installed[125] These visits suggested that there was considerable scope for deploying proven and pragmatic renewable technologies provided they are installed in appropriate settings. These technologies may be especially suited to new-builds or refurbishments in KCC's estate, though the potential for retro-fitting existing buildings should also be explored.

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http://www.publications.parliament.uk/pa/cm200506/cmhansrd/cm060608wmstext/60608m0068.htm

[124] See evidence received from Mr Mike Austerberry and Mr Steve Bell of KCC's Property Group at the hearing on 28 April 2006 (paragraph 11).

[125] Members visit on 10 May 2006 organised by Creative Environmental Networks ("CEN").

7.9.4 Pictures 7.9.4 – Left hand picture: Members of the Select Committee inspecting solar panels with Mr Peter Leutner. Right hand picture: Select Committee chairman Mr Chris Wells inspecting a ground source heat pump at Petham Village Hall with Mr Roger Purnell.

7.9.5 Pictures 7.9.5– Left hand picture: Members of the Select Committee inspecting a woodchip biomass burner being installed and tested on Mr John Leigh-Pemberton's estate. Right hand picture: Members of the Select Committee inspecting a windmill at the Wildwood Trust at Herne.

7.9.6 The Select Committee also noted helpful evidence commenting on the finance of installing renewables from Mr John Thorpe of the Energy Centre for Sustainable Communities[126] based on the experiences of Woking Borough Council.

7.9.7 The Select Committee also noted a particular issue in installing renewables or other low carbon technologies in schools. Whilst the investment costs would be incurred by KCC, as these are capital costs, the benefits would accrue to the schools as the savings would be revenue in nature. This could clearly leave KCC in an adverse financial position. Evidence from Mr Mike Austerberry and Mr Steve Bell suggested that in principle, KCC could enter into a contractual arrangement with the school governors to recoup a portion of the savings[127]. The Select Committee is keen to see this theoretical possibility translated into reality as soon as possible. Mr Thorp of the Energy Conservation and Solar Centre also identified a solution to a similar issue that Woking Borough Council had implemented with the use of power purchase contracts[128] and Mr Thorp and Ms Wendy Goddard of Creative Environmental Networks both noted solutions to this issue using Energy Service Companies ("ESCO's")[129].

7.9.8 The Select Committee also took evidence from Ms Sarah Weston, the KCC Officer responsible for the Kent ECO-Schools initiative and Ms Carolyn

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[126] Evidence received at the hearing on 15 May 2006 (paragraph 9 *et seq*).

[127] Evidence received at the hearing on 28 April 2006 (paragraph 11).

[128] Evidence received at the hearing on 15 May 2006 (paragraph 22).

[129] Evidence received from Mr Thorp at the hearing on 15 May 2006 (paragraph 8) and from Ms Goddard at the hearing on 28 April (paragraphs 12 and 13).

McKenzie, KCC's Kent Sustainable Business Partnership co-ordinator[130]. The Eco-schools programme encourages schools to pursue initiatives for sustainable waste, energy and water use, both in the management of the school estate and the behaviour of students, staff and, indirectly, parents.

7.9.9 The Select Committee was very impressed with this exemplary initiative and commends highly the demonstrable success it has had – most notably with Eastchurch Primary School on Sheppey[131], which received a national award (the Ashton Award for Sustainable Energy worth £10,000 to the school) in June 2006.

7.9.10 The Select Committee was therefore particularly concerned to learn about the very limited resources available for promotion of the Eco-Schools initiative. The Select Committee's first concern is that a single KCC officer on a time-limited contract was the sole resource devoted to the initiative. The Select Committee regards this as unacceptable as this initiative must be adequately funded as a long-term commitment.

7.9.11 The second concern was that the practical and symbolic importance of schools becoming more resource-efficient and environmentally aware was left almost to chance or the extra-curricular efforts of willing staff and students. The Select Committee was surprised that some of the initiatives being promoted voluntarily via the Eco-Schools initiative were not compulsory requirements in the construction and operation of all public educational establishments. If these

[130] Written evidence received from the Kent Eco-Schools Officer and oral evidence received from Ms Carolyn McKenzie, KCC Kent Sustainable Business Partnership Co-ordinator at the hearing on 15 May 2006 (paragraph 2).

elements could be made compulsory, it would help mitigate the impact of climate change and raise educational awareness among children (see section 8.7).

7.9.12 **Recommendation 6:** Increase support for energy efficiency and renewable energy, particularly micro-generation, in the KCC Estate and across Kent as a whole.

The Select Committee recommends that KCC:-

1. Commit to the BREEAM "Very Good" standard and adopt a clear timetable to move to the BREEAM "Excellent" standard or its equivalent for all new school and other buildings and major refurbishments.

2. Identify targets to significantly increase the retrofitting of existing school and other buildings with energy efficiency measures and renewable energy installations.

3. Write into procedures governing the management of school estates key energy saving practises.

4. Review the targets for carbon reduction in KCC's Carbon Management Plan with a view to setting more ambitious targets and ensure that adequate resources are in place for their delivery.

5. Ensure the Kent ECO-Schools initiative is adequately funded and staffed to achieve delivery of this initiative to all Kent schools.

Strengthen the focus on sustainable operation in the induction, training and performance regime for school governors and those who manage the KCC estate.

[131] See: http://news.bbc.co.uk/1/hi/england/kent/5087500.stm

7.10 Transport - Introduction

7.10.1 The Select Committee primarily received oral evidence on Transport from Professor Roger Vickerman of the University of Canterbury and Mr Mick Sutch, KCC's Head of Planning and Transport Strategy. In addition, the Select Committee also received oral and written evidence on Transport from Mr Peter Moore, KCC's Environment Strategy Manager. The following sections draw heavily on this evidence and have been further subdivided into emissions from transport in Kent and emissions from transport by KCC Staff for ease of reference.

7.11 Transport - Emissions from Transport in Kent

7.11.1 De-coupling economic growth from increasing road traffic is one the greatest challenges facing both central and local government today[132]. All forms of motorised transport in operation in Kent today generate carbon dioxide emissions and some are responsible for the emission of other greenhouse gases such as nitrous oxide.

7.11.2 National figures show that transport is the fastest growing source of carbon dioxide emissions, and that road transport alone currently accounts for over a quarter of Kent's emissions (see section 7.3.2). As the rate of traffic growth in

[132] The Select Committee noted that this point was also made by Mr Richard Moyse of the Kent Wildlife Trust at the hearing on 28 April 2006 (paragraph 17).

Kent has exceeded the national rate[133], it is safe to assume that transport is probably the fastest growing source of carbon dioxide emissions in Kent - and that it will become more so if the planned extensions to the road network and aviation services take place[134].

7.11.3 The Select Committee recognises that while reducing emissions from traffic is a difficult challenge, it must be given a much higher priority within KCC's other transport policies. As traffic appears to be growing faster than vehicle efficiency is increasing[135], it is unlikely that we will do so unless we adopt the reduction of overall emissions from traffic as a clear and unambiguous objective, put measures in place to achieve this and take the argument to what may initially be a sceptical public without fear of being accused of being 'anti-car'.

7.11.4 The Select Committee received evidence from Mr Mick Sutch, KCC's Head of Planning and Transport Strategy on Kent's Local Transport Plan ("LTP")[136]. This LTP emphasises 'providing sustainable alternatives' and 'reducing congestion', but the Select Committee is concerned that both of these objectives could be met without reducing carbon dioxide emissions from transport. While 'promoting

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[133] See figures cited in *Kent Environment Strategy: 2005 Progress Report, p24*, KCC March 2005. This document can be found at: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

[134] These are detailed in the Kent and Medway Structure Plan ("KMSP") and the Local Transport Plan ("LTP") (2006-2011) policies. The KMSP was adopted in July 2006. Chapter 9 (p 57 *et seq)* considers climate change issues specifically, although policies elsewhere in the KMSP are also relevant. For the KMSP, see: http://www.kmsp.org.uk/pdfs/KMSPAdoptedPolsKDJul06.pdf. The LTP also considers climate change issues and again policies elsewhere in the KMSP are also relevant. See: http://www.kent.gov.uk/static/local-transport-plan/sitemap.html

[135] For example, see: http://news.bbc.co.uk/1/hi/sci/tech/4837174.stm

[136] See: http://www.kent.gov.uk/static/local-transport-plan/sitemap.html

alternatives' should in theory deliver carbon savings, there is no guarantee that it will if underlying demand for travel rises unchecked.

7.11.5 It is also possible to reduce congestion, e.g. by expanding roads or speeding up traffic flows etc, in ways which are likely to increase traffic overall or release demand currently suppressed by congestion[137]. In doing so, it is likely that the most pressing air quality problem threatening everyone – that of carbon dioxide emissions – would also rise, even if local air quality problems are addressed.

7.11.6 The Select Committee recognises that there are limits to KCC's ability to affect the sort of change necessary to fundamentally tackle transport emissions. However, in the context of historic levels of traffic growth of between 1-2% in recent years, the Local Transport Plan target of limiting traffic growth to 2% per annum[138] amounts to little more than 'business as usual'. As has become clear from the Select Committee's inquiry, 'business as usual' is not just an inadequate response to climate change, it will turn what is currently the possibility of dangerous climate change into a near certainty.

7.11.7 Aviation, among the fastest growing sources of carbon emissions, is not immune from climate change impacts. The Kent and Medway Structure Plan and other strategic documents produced by KCC express support for the expansion of air services from Manston and Lydd airports, subject to environmental concerns

[137] For example, see evidence from Professor Roger Vickerman of the University of Kent received at then hearing on 15 May 2006 (paragraphs 56 *et seq* and 71).

[138] See: http://www.kent.gov.uk/static/local-transport-plan/section_1321695484.html

being addressed[139]. The Select Committee finds it difficult to see how the concern about rising carbon dioxide emissions and their contribution to global warming can be addressed by expanding air services and as such urges KCC to apply the strictest possible tests to any proposals for airport expansion to ensure that the potential contribution to increased carbon emissions is taken into account.

7.12 Transport - Emissions From Transport for KCC Staff and Members

7.12.1 As can be seen in Table 7.8.3, KCC staff transport, especially staff commuting as opposed to business miles, represents one of the largest sources of carbon emissions within the KCC estate - over 40%. The Select Committee recognises the work done under the auspices of KCC's LTP to address these impacts[140]. However, the Select Committee feels that to effectively lead by example, there needs to be a greater focus within the LTP on the achievement of real and significant reductions in the car mileage travelled by KCC staff both in their journeys to work and in the course of their duties.

7.12.2 The Select Committee notes that the Environment Agency has a published target to reduce total emissions from business travel by car by 50% by March 2007 using a 2001/2002 baseline[141]. The Select Committee believes that a comparable statement of intent of this order would be appropriate for KCC.

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[139] See note 134 *supra*.

[140] See note 136 *supra* and http://www.kent.gov.uk/NR/rdonlyres/CB746460-37C4-493E-8EBA-824A191D143D/0/app11smarterchoices.pdf

[141] See the following Environment Agency document at paragraph 1.35 and 4.6 (pp 3 and 7): http://www.environment-agency.gov.uk/commondata/acrobat/travel_rev_v3_200304_925830.pdf

7.12.3 Second to the amount of travel by KCC staff, the mode of travel offers scope for further reducing emissions. The Select Committee welcomes the achievement of the target in the LTP to increase the proportion of staff travelling to work by sustainable modes to 60%[142], but notes that this can be achieved without necessarily reducing the carbon footprint of KCC staff transport. The Select Committee also notes the large number of KCC events, particularly events which are solely attended by KCC staff, which take place at locations which are difficult to access by modes other than the car. When these events involve external audiences, we must be mindful of the message this sends about where our priorities lie.

7.12.4 The fuels used in KCC vehicles offer further potential to reduce emissions. The Select Committee recognises that there may be limits to the extent to which bio-fuels will provide 'the answer' to transport's contribution to climate change, as the area of land needed to grow the biomass needed to fuel the UK's vehicle fleet would be likely to exceed that on which we currently grow food.

7.12.5 This said, there is clearly some scope for expanding the use of fuels with a lower carbon content, and as bio-diesel is already commercially available, we can see no reason why KCC should not seek to ensure that its diesel vehicles take advantage of this existing source of supply, as long as it comes from certified,

[142] KCC Corporate Environmental Performance Report 2006. See: http://www.kent.gov.uk/NR/rdonlyres/2FD7C424-AE49-4D74-9B61-9595A0F6832E/3831/cepreport2005.pdf

sustainable sources.[143] The Select Committee believes that bio-diesel offers great potential to KCC and is the subject of a recommendation in section 7.7.7.

7.12.6 Another way in which KCC can influence emissions of carbon dioxide from its transport operations is via the vehicles it makes available to members of its lease car scheme for essential users. For example, it is possible to encourage take-up of the most efficient vehicles by shifting the balance of any subsidy available within the scheme.

7.12.7 It is also be possible to ensure that the least efficient models are simply not made available as an option to staff. This could be done without significantly reducing the choice of model available to lease car scheme members. It is also worth noting that as lease cars tend to be used for private journeys, and form a major part of the new and second hand car markets, the impact of ensuring that fuel-efficient vehicles are favoured via the lease car scheme would extend far beyond the issue of mileage travelled on KCC business.

7.12.8 **Recommendation 7**: Review Transport Policy to achieve an overall reduction in emissions from transport in the KCC estate and across Kent as a whole.

The Select Committee recommends KCC:-

1. Review its approach to transport policy to put reduction of greenhouse gas

[143] General evidence on biofuels received from Kevin Harlock, KCC Commercial Services Director, at the hearing on 15 May 2006. Bio-deisel available at the pump is typically a 5% blend of bio-diesel with normal diesel. It is understood that higher percentage blends (10-20%) are acceptable in many diesel engines (paragraphs 42 and 50) but the obstacle to their use is the validity of vehicle warranties offered by manufacturers.

emissions from transport as a foremost objective.

2. Re-prioritise transport schemes within its Local Transport Plan to bring forward those which are likely to deliver absolute reductions in emissions.

3. Lead Kent's residents and businesses to a better understanding of the total costs of transport and use its influence as planning and highways authority to deliver real reductions in emissions.

4. Lobby central and regional government about the current and future contribution of road and air transport to climate change and the need for national and regional measures to reduce emissions where local ones alone will not work.

5. Raise the existing target to increase commuting by KCC staff by public transport, walking and cycling, and set a new target to reduce overall business mileage travelled by KCC Members and Staff.

6. Review the lease car scheme for KCC staff to prioritise the use of low carbon dioxide emissions vehicles and eliminate the option to select vehicles with high carbon emissions.

7.13 Land-Use and Planning - Introduction

7.13.1 The Select Committee primarily received oral evidence on these areas from Mr Rob Shaw, Policy Manager at the Town and Country Planning Association and Mr Daniel Salisbury, KCC's Sustainable Construction Advisor. The Select Committee also received written evidence from Dick Feasey, KCC's Development Planning Manager. In addition, the Select Committee also

received oral and written evidence on these areas from Mr Peter Moore, KCC's Environment Strategy Manager. The following sections draw heavily on this evidence and have been further subdivided for ease of reference.

7.14 Land-Use and Planning - Making Efficient Use of Land to Tackle Climate Change

7.14.1 Undeveloped land will typically absorb carbon thought the growth of plants more effectively than land which is developed or in agricultural use. Making efficient use of land, and allowing a higher proportion of land to return to a natural state, is as legitimate and desirable a response to climate change as reducing emissions of carbon dioxide from energy use or transport.

7.14.2 This does not mean that planting some trees when we build a housing estate will be an adequate response to the threat of climate change. Rather, it means a relentless focus on making efficient use of land, minimising the loss of undeveloped land, and improving the quality and extent of those habitats which can act as 'carbon sinks[144]'. As well as absorbing carbon, undeveloped land also helps regulate water availability, quality and flood risk and should therefore be regarded as a form of adaptation to future climate change as well as a form of mitigation. The Kent Biodiversity Action Plan[145] sets out targets for habitat creation, and their delivery will serve the dual purpose of enhancing carbon sinks and helping wildlife adapt to climate change.

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[144] Forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting carbon dioxide emissions.

[145] See: http://www.kent.gov.uk/publications/environment/biodiversity-action-plan.htm

7.14.3 Making efficient use of land by recycling brownfield sites and building at higher densities will also support more sustainable patterns of transport as existing urban areas tend to be better served by public transport and the viability of public transport services improves in more compact built environments. The Select Committee notes that there is a target of 70% of development to be on Brownfield sites[146], which is being met[147].

7.15 Land-Use and Planning - The Volume of New Development Facing Kent and its Impact on Emissions

7.15.1 Projections of household growth, which could see 120,000 new houses built in Kent over the next 20 years[148], must be a cause of serious concern about future emissions, water supply and other factors associated with climate change. Central Government has been pressing strongly for higher levels of growth in the south east. Facing concerns this may be unsustainable, the South East Plan[149], the regional spatial strategy for the South East, is setting housing levels for Kent for the period to 2026.

7.15.2 The volume of new development will continue to be one of the key variables in determining future greenhouse gas emissions arising from Kent. This should form a key part of KCC's representations during the forthcoming examination in

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[146] KMSP policy HP3. See: http://www.kmsp.org.uk/chapter07.html

[147].See:http://www.kent.gov.uk/NR/rdonlyres/2F379FCA-BF35-435F-8347-0074850C0324/6082/2005hlsgreenfieldcompletions.pdf

[148] See note 46 *supra*.

[149] See: http://www.kent.gov.uk/council-and-democracy/priorities-policies-and-plans/priorities-and-plans/south-east-plan/

public of the South East Plan, which, when adopted, will determine the overall volume of development which Kent will experience over the next 20 years.

7.16 Land-Use and Planning - Standards of Sustainable Construction

7.16.1 The Select Committee noted that, despite there being much talk of 'carbon-neutral' development, the reality of it was some way off[150]. Current efforts to modestly increase the energy efficiency of new buildings and generate a modest proportion of their energy needs from renewable sources would, without demolition of the existing stock of buildings, merely take the edge off an underlying growth in emissions.

7.16.2 The Select Committee notes the over-arching policies covering sustainable construction in the Kent and Medway Structure Plan ("KMSP")[151]. However, as a strategic plan it lacks the detail necessary to set clear minimum standards for energy or water efficiency which must form part of our response to climate change.

7.16.3 The Kent Design Guide[152] may, however, be able to fulfil this role if it sets clear standards of environmental performance and is adopted as a Supplementary

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[150] Evidence on carbon-neutrality primarily received from Mr Rob Shaw, Policy Manager at the Town and Country Planning Association and Mr Daniel Salisbury, KCC's Sustainable Construction Adviser, at the hearing on 12 April 2006 (paragraph 13 *et seq)* and Ms Wendy Goddard of Creative Environmental Networks at the hearing on 28 April 2006 (paragraph 9).

[151] Written evidence received from Dick Feasey, KCC Development Planning Manager. The KMSP was adopted in July 2006. Chapter 9 (p 57 *et seq)* considers climate change issues specifically, although policies elsewhere in the KMSP are also relevant.
See: http://www.kmsp.org.uk/pdfs/KMSPAdoptedPolsKDJul06.pdf

[152] See: http://www.kent.gov.uk/publications/council-and-democracy/kent-design-guide.htm

Planning Document to the Local Development Frameworks being produced across Kent by district councils. As the volume of development rises over time, it follows that these standards should rise accordingly if we are to avoid cumulative increases in greenhouse gases from development.

7.16.4 Earlier drafts of the South East Plan included a policy requiring the achievement of BREEAM 'very good' standard for new development but this policy was removed in response to consultation in 2005. In view of the high level of development proposed in the South East Plan, it is vital that that which does take place meets the highest standards in terms of greenhouse gas emissions. Without a clear basis in planning policy for insistence on high standards of sustainable construction, local authorities may shy away from rejecting sub-standard development for fear of losing appeals. This can not be allowed to stand in the way of a rigorous approach to raising environmental performance in new buildings.

7.17 Land-Use and Planning - KCC and Specific Development Proposals

7.17.1 KCC's support is inevitably sought for a wide range of development proposals throughout the county, whether promoted by district councils, private developers or other interests. KCC is also the planning authority for many of its own developments, as well as minerals and waste planning applications. Among the many considerations which KCC must apply before deciding to lend its support, or express concern or opposition, to such proposals, or to reject or approve them when it acts as the planning authority, the Select Committee believes that climate change should feature very high on the list.

7.17.2 It is critical that any development supported by KCC can be shown to have minimal impact in terms of energy use, traffic generation, efficient use of land and materials, waste generation and water use. This should be reflected both in our formal development control decisions and the informal positions we take on proposals for which we are not the ultimate planning authority. It is vital for the credibility of the organisation as it seeks to develop its response to climate change, as well as to the ultimate aim of reducing carbon dioxide emissions. A clear process is required to assess the impact of proposals on emissions before KCC offers its support.

7.17.3 **Recommendation 8:** Make more efficient use of land in the development process and meet higher standards of sustainable construction.

1. Development Control

The Select Committee recommends that KCC's development control function give high priority to climate change specifically to:

A. Ensure that they have considered adaptation to climate change impacts, using the criteria set out in the *Adapting to Climate Change: Checklist for Development* produced by the South East Climate Change Partnership[153].

B. Ensure that these principles and others relating to sustainable construction are reflected in the Kent Minerals and Waste Local Development Framework.

[153] A copy of this document can be downloaded from the SECCP web-site, please see: http://www.climatesoutheast.org.uk/downloads/TRCCG%20Checklist%20for%20Development%20Nov%202005.pdf

2. South East Plan

The Select Committee recommends that in making representations on the South East Plan KCC:

A. Continue to express concern about the volume of development facing Kent, as it will increase both our contribution to climate change and our exposure to its impacts, most notably in terms of water stress and flood risk.

B. Lobby for the strictest possible tests for new development in respect of greenhouse gas emissions, air quality and resilience to climate impacts.

continued……

C. Call for re-insertion of the policy for all new development to meet at least the BREEAM 'very good' standard for sustainable construction and to set a clear policy framework for moving rapidly towards carbon neutral development.

3. Local Development Frameworks

The Select Committee recommends that, in working with Kent's District Councils to develop their Local Development Frameworks, KCC should:

A. Seek to ensure that Kent and Medway Structure Plan policies to build at higher densities and meet brownfield development targets are rigorously observed and improved upon where possible.

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[154] "The Government expects all planning authorities to include policies in their development plans that require a percentage of the energy in new developments to come from on-site renewables, where it is viable". DLCG statement on PPS22 dated 8 June 2006. See: www.publications.parliament.uk/pa/cm200506/cmhansrd/cm060608wmstext/60608m0068.htm .

B. Insist on new development meeting the BREEAM 'very good' standard as a minimum, and, within this the ‘excellent’ standard for the energy and water elements of the assessment.

C. Set targets for creating and linking natural habitats based on the Kent Biodiversity Action Plan, along with clear action plans for their delivery.

In addition to all of the above, the Select Committee also notes proposals for measures to minimise emissions, through energy efficiency and the use of renewable energy, in government advice that at least 10% of energy needs should be met from renewable sources[154] and anticipates this policy being reflected in plans and planning decisions at regional, county and district level.

7.18 Other Areas Where KCC Can Lead by Example on Mitigation

7.18.1 The Select Committee identified 2 other areas where KCC is well-placed to lead by example on mitigation. These are waste efficiency and procurement and these are discussed below.

7.19 Waste Efficiency

7.19.1 Although waste accounts for only 0.3% of KCC emissions, the Select Committee regards a key message used with waste in the wider community – “Reduce, Reuse, Recycle” – as being a message that can be applied in a wider setting to mitigate the impact of climate change.

7.19.2 Waste efficiency is included in the recommendation at 7.9.12. Although this relates to the Kent ECO-Schools initiative, the principles noted in that recommendation can be equally applied throughout KCC and not just schools.

These points would back up current KCC initiatives on waste management, such as the 'War on Waste' initiative.

7.20 Procurement

7.20.1 Due to its size, KCC as an organisation has considerable strength in procurement terms. The Select Committee noted a good example of this with the use of Green Energy – 46% of KCC's energy has come from renewable sources since 2005 and this will continue for most of 2006 (see section 7.8.6).

7.20.2 In addition to energy procurement, KCC should take a holistic approach to ensure measures to mitigate the impact of climate change are included in procurement in other areas.

7.20.3 An example could be to continue to support initiatives such as the 'Produced in Kent' initiative to ensure local food is supported, one of the benefit of which is reduced emissions as fewer 'food miles' are incurred[155]. The Select Committee is pleased that Produced in Kent is being supported by KCC to supply food to schools under a new contract as reported in the Local Government Chronicle of 1 June 2006. Contracts like these should be pursued further.

[155] An example of this can be found on Produced in Kent's own website. Please see http://www.producedinkent.co.uk/cgi-local/news.cgi?action=item&newsid=46

8 Responding to Climate Change - Community Leadership

8.1 Summary of Points Covered in Section

- **Kent's response to climate change should be steered by a new Climate Change Action Plan, produced by KCC and the Kent Partnership as a key supporting document to the *Vision for Kent*.**

- **This action plan should incorporate clear and ambitious targets which reflect the fact that Kent has more to lose than most from climate change. These targets should in turn be reflected in future iterations of the Kent Agreement to underline our commitment to achieving them and ensure that they command the focus and resources necessary to do so. The action plan should be accompanied by a high profile communications programme aimed at Kent's residents and businesses to help them reduce their contribution to, and adapt to, climate change.**

- **KCC should review its political and managerial arrangements to ensure that there is clear leadership, co-ordination and lines of accountability for different aspects of the climate change agenda.**

- **Climate change must become a mainstream consideration in KCC's business planning, risk assessment and other corporate plans.**

- **Better climate change education is vital to help adults of tomorrow understand and reduce the risks associated with climate change.**

8.2 Section Introduction

8.2.1 This section covers the following themes:-

- Best practice elsewhere
- Working in Partnership
- Strategic political and managerial leadership

8.3 Best Practice on Climate Change

8.3.1 The Select Committee received evidence of "Best Practice" elsewhere from a variety of witnesses, including SECCP, Carbon**sense,** UKCIP and ECSC, as well as other local authorities[156]. The Select Committee particularly found the evidence received from Mr Steve Waller of I&DeA useful[157] and is pleased to note the wealth of evidence and approaches available to local authorities to address the impact of climate change.

8.3.2 A number of witnesses highlighted the need for a strategy or action plan to steer activity on climate change[158]. There is, on paper, already a clear policy basis for action on climate change in Kent in the *Vision for Kent* and *Kent Environment Strategy*. The Select Committee is concerned, however, that while this high level recognition of the issue is welcome, it is not reflected in a detailed plan of action to respond to climate change, nor in the day-to-day decisions and actions of KCC

[156] See evidence received as follows: SECCP and Croydon Borough Council at the hearing on 10 April 2006, Carbon**sense** at the hearing on 12 April 2006, Maidstone Borough Council at the hearing on 26 April 2006 and UKCIP at the hearing on 3 May 2006 and ECSC at the hearing on 15 May 2006.

[157] See evidence received from I&DeA at the hearing on 3 May 2006 (paragraph 4 *et seq)*.

[158] See note 156 *supra*.

or its partners. The Select Committee agrees with the suggestion from a number of witnesses that the preparation of a Climate Change Action Plan for Kent will be necessary to ensure a concerted and co-ordinated approach, and to identify specific action to support the high-level recognition of the problem referred to above.

8.3.3 The Select Committee debated where such an action plan should 'sit' in relation to other corporate plans and strategies in Kent, and came to the conclusion that the cross-cutting nature of the climate change issue means that it can not be addressed simply as an 'environmental' issue. As such, the Select Committee felt that it should be developed as a 'daughter document' to the *Vision for Kent*, which is the over-arching community strategy for Kent, enjoying the support of a wide range of partners. It follows that the Climate Change Action Plan should be produced by the Kent Partnership rather than KCC alone to ensure that it has the involvement and support of a wide range of partners in Kent.

8.3.4 It is clear from the lack of progress towards the aspirations and targets in the Kent Environment Strategy[159] that the existence of a strategy or plan alone is not enough. As the Select Committee notes elsewhere, these high level aspirations and targets need to be reflected and reinforced in the mainstream of KCC's corporate planning and performance management regime, and cascaded through the business plans and work programmes of individual service

[159] See *Kent Environment Strategy: 2005 Progress Report*, p30 Kent Partnership, March 2005, for a detailed discussion and an assessment of progress against 25 key indicators. See: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

directorates within KCC. The experience of the Kent Agreement, comprising the Kent Public Service Agreement (PSA) and Local Area Agreement (LAA), suggests that the inclusion of specific objectives within such agreements tends to focus the necessary corporate effort and resources on their delivery. In this regard, it would be helpful if future iterations of the Kent Agreement were to address the current absence of targets relating to climate change, reducing energy use, tackling traffic or any of the other main sources of greenhouse gas emissions. The Select Committee was impressed to hear of the experience of other local authorities in Kent, including Medway, which has a PSA target on carbon reduction[160], and urges KCC to emulate this approach in future iterations of the Kent Agreement.

8.3.5 The Select Committee wishes to highlight evidence received from I&DeA about key success factors for local authorities[161]:

[160] Evidence received from Ms Wendy Goddard of Creative Environmental Networks ("CEN") at the hearing on 28 April 2006 (paragraphs 4, 6 and 10).

[161] See note 157 *supra*.

8.3.6 **Diagram 0**: Key Success Factors for Local Authorities to Adapt and Mitigate the Impact of Climate Change.

8.4 Strategic Targets and Indicators

8.4.1 The Select Committee received evidence from internal sources on strategic targets and indicators, principally from Ms Carolyn McKenzie, KCC Sustainable Business Partnerships Co-ordinator, Mr Andy Morgan, KCC Energy Manager based in the LASER Energy Management Group in KCC Commercial Services and Mr Peter Moore, KCC Environment Strategy Manager.

8.4.2 The Select Committee noted the targets in the KCC Corporate Environmental Performance Report[162], targets contained in documents such as V*ision for Kent* - "to meet the national target of a 20% reduction in carbon dioxide emissions by 2010"[163] - and the *Kent Environment Strategy* on energy use[164].

8.4.3 The Select Committee notes the lack of progress towards these targets[165] and believes that more needs to be done if we are to meet the challenge posed by climate change.

8.4.4 The Select Committee also wishes to focus attention on the key output indicator for mitigating future climate change – i.e. to reduce in *absolute* terms the total carbon dioxide emissions arising within Kent. The targets KCC should adopt must relate to absolute levels of emissions rather than relative levels. It is the absolute level of greenhouse gases that will decide the extent of climate change in the future.

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[162] See http://www.kent.gov.uk/publications/environment/cep-report-2005.htm

[163] *Vision for Kent,* April 2006, p30. See: http://www.kent.gov.uk/NR/rdonlyres/2907E1BF-37D7-4E75-8850-9FE9366BA208/0/VisionlinkedNEW.pdf

[164] *Kent Environment Strategy* 2003 targets: a 25% reduction in carbon emission by 2030; 20% of energy from renewable sources by 2020; all new development to near zero-carbon standards. See: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

[165] *The Kent Environment Strategy 2005 Progress Report* cites national figures showing that carbon dioxide emissions are rising again, estimates renewable energy production in Kent as 0.65% of the total and suggests that there has been little progress towards 'near-zero carbon development'. See: http://www.kent.gov.uk/NR/rdonlyres/192B4EB8-BDBC-4090-BBD0-F8CEB67AB57E/134/fullprogressreport2006.pdf

8.4.5 The Select Committee regards clear and ambitious targets as essential and necessary to drive activity, focus and measure progress. Such targets should be a fundamental part of a climate change action plan. (See recommendations at sections 8.4 and 8.6.4.) The Select Committee believes that there is also scope for monitoring climate change indicators at the Kent level to build a Local Climate Profile, adding a layer of local knowledge and detail to the national and regional climate change data made available by UKCIP and others. Indeed, creation of such a Local Climate Profile was recommended by UKCIP[166].

8.4.6 The Select Committee acknowledges the reaction in local government to the proliferation of targets and performance indicators imposed by central government. However, the Select Committee believes climate change is an issue of such profound significance that a clear message supported by clear targets is required.

8.4.7 The Select Committee could not take enough qualified evidence to recommend specific targets in all areas. However, Kent will suffer a greater impact from climate change than the rest of the UK so it follows that targets adopted must at least be as demanding as national targets. Based on the evidence presented, the Select Committee recommends the following as targets for KCC and Kent:

[166] Evidence received from UKCIP at the hearing on 3 May 2006 (paragraph 18).

8.4.8 **Table 8.4.8**: Potential Climate Change Targets for (i) Kent and (ii) KCC

INDICATOR	SIGNIFICANCE	EXISTING TARGET	SOURCE	SELECT COMMITTEE RECOMMENDATION
Targets for Kent				
Kent's ecological footprint	Measures resources consumed according to our share available globally – a fundamental indicator of sustainability and of the resource efficiency of the economy	'Reduce Kent's ecological footprint to sustainable levels'	*Vision for Kent* 2006	**Specify benchmarks and timescales to reduce Kent's ecological footprint**
Kent's carbon footprint	Total carbon dioxide emissions arising within Kent – our main contribution to climate change. The key output indicator for mitigating future climate change.	20% reduction on 1990 level by 2010 25% reduction on 1990 level by 2030	*Vision for Kent* 2006 *Kent Environment Strategy* 2003	**Adopt national target of 60% by 2050 to complement 2010 target and set appropriate milestones**
Carbon dioxide emissions by sector	Total carbon dioxide emissions arising within Kent broken down by sector, indicating carbon-intensity of different types of economic activity.	None	Data available via the National Environmental Technology Centre ("Netcen")[167]	None – but use indicator to identify sectors which might need particular help or advice

[167] See also Table 7.3.3 and note 105. For further information on Netcen, please see: http://www.netcen.co.uk/index.php

INDICATOR	SIGNIFICANCE	EXISTING TARGET	SOURCE	SELECT COMMITTEE RECOMMENDATION
Road traffic volume	Transport is fastest growing source of carbon dioxide emissions. Traffic currently growing faster than vehicle efficiency is improving.	Limit traffic growth to under 2% per annum	*Local Transport Plan for Kent* 2006-11	**Review approach to emissions reduction from traffic and identify measures required to achieve real reductions**
Waste generation	Waste minimisation will directly equate to significant energy savings	Reduce waste growth to zero by 2012	*Kent Environment Strategy*	**Reaffirm Kent Environment Strategy target and supplement with targets to reduce waste arising further beyond 2012**
Renewable energy generation	Low or no-carbon energy sources key to de-couple energy consumption from climate change	20% by 2020 10% by 2010 111 mw installed capacity by 2010; 154 mw by 2016	*Kent Environment Strategy* DCLG planning guidance South East Plan	**Reaffirm Kent Environment Strategy target**

INDICATOR	SIGNIFICANCE	EXISTING TARGET	SOURCE	SELECT COMMITTEE RECOMMENDATION
Efficient use of land	Physical development prevents land performing its natural function of regulating local and global climate; pattern and density of development influences emissions.	70% of development on brownfield sites (minimum) Minimum housing density of 30 dwellings per hectare and 50 in central urban areas.	*Kent and Medway Structure Plan* *Kent and Medway Structure Plan*	**Reaffirm KMSP minimum standards on previously developed land and density, ensure they are reflected in district LDFs and identify potential to exceed them**
Targets for KCC				
KCC's carbon footprint	See above	7.5% per m2 by 2010, 15% per m2 by 2015 (proposed targets)	*Corporate Environmental Performance Report* 2004-05	**Adopt percentage targets for carbon dioxide reduction rather than 'per m2' and ensure these are at least in line with national carbon dioxide reduction targets**

INDICATOR	SIGNIFICANCE	EXISTING TARGET	SOURCE	SELECT COMMITTEE RECOMMENDATION
KCC green energy procurement	Reduces KCC's carbon footprint – currently 46% of KCC electricity supplied from renewable sources - about to fall to 0% following new energy contract	None	N/a	**Adopt a clear and ambitious target for a percentage of electricity needs to be met from renewable sources by 2008**
KCC staff travel	Major element of KCC's carbon footprint	None	N/a	**Raise target for travel to work by sustainable modes and adopt clear target to reduce KCC business mileage**
Use of biodiesel in KCC vehicles	Reduce KCC's carbon footprint and support development of market for bio-diesel	None	N/a	**Procure bio-diesel from sustainable sources for all KCC diesel vehicles as soon as practicable**

8.4.9 The Select Committee therefore makes the following recommendation:

8.4.10 **Recommendation 9:** Introduce a Climate Change Action Plan, supported by clear targets.

The Select Committee recommends:-

1. KCC, with the Kent Partnership, to develop a Climate Change Action Plan for Kent as a key supporting document to the *Vision for Kent*. This will set out how KCC and our partners can reduce our contribution to and prepare for the impacts of climate change. This needs to be consulted upon widely and in a quick timeframe.

2. KCC to adopt and publish clear targets to reduce carbon dioxide emissions in both the wider community and its own estate and reflect these in the Climate Change Action Plan.

3. These targets to be at least as challenging as national targets and reflected in strategic documents and commitments such as Local Area Agreements and Public Service Agreements.

4. KCC's Analysis and Information Team to identify and monitor appropriate climate change indicators for Kent and develop a Kent Local Climate Profile.

8.5 Climate Change Communications

8.5.1 The Select Committee sees effective communications as central to KCC's efforts to lead the community to a deeper understanding and a more concerted response to climate change.

8.5.2 KCC has considerable communications infrastructure, corporate communications staff, publications, presence on the web, relationship with council taxpayers, communities and organisations across Kent. The Select Committee believes we must harness this potential to raise awareness about climate change, and what can be done to tackle it, by using every means and media at our disposal.

8.5.3 Global climate change has had such a high media profile in recent months that many Kent residents are likely to be receptive to more detailed information on what it means for their county, communities and homes and what they can do to respond[168].

8.5.4 It is important that messages promoting awareness of climate change also get to people who are difficult to reach, and those who might not respond to communications about traditional environmental issues. KCC should consider using the more familiar socio-economic issues in which people have a self-interest to make links to the wider issue of climate change. For example, Kent's residents will certainly be interested in transport, energy costs, waste

[168] An example include the evidence received from Miss Becky Ribbens at the hearing on 26 April 2006, whose opinion was that young people are more likely to respond to radio jingles and "give-aways" but not leaflets.

management, farming, tourism and food etc – those sectors of society that are affecting, or being affected by, climate change.

8.5.5 **Recommendation 10**: High profile communications programme.

The Select Committee recommends:-

1. KCC to develop a programme which will communicate the positive action that can be taken to reduce the risks of climate change and to prepare for that change which is already inevitable.

2. This must be co-ordinated with the production of a Climate Change Action Plan for Kent.

8.6 Strategic Political and Managerial Leadership

8.6.1 The Select Committee received evidence from various KCC internal officers and Cabinet Members as part of the topic review. The Select Committee formed the following views, which some witnesses may share and recognise, that:

- There is a lack of co-ordination of the activities relating to climate change.

- Although reviewing the whole of KCC's activity was outside the scope of the Select Committee's terms of reference, activity seemed to be initiated or led by middle-ranking officers with rather limited support and involvement from senior officers or politicians. This is not an effective response to climate change given the scale of the challenge.

- Awareness of climate change impacts exists within some directorates but was less evident or apparently absent from others. This is a fundamental issue as climate change will impact on all directorates.

- While there is good work underway to reduce the impact of KCC's own operations, this was not matched by activity to reduce Kent's impact or prepare for impacts as a whole.

- KCC is not visibly leading the community through education, policy and practice as proactively or effectively as it might

8.6.2 The Select Committee concludes that not enough is being done to ensure KCC's compliance with commitments in policy documents, such as the Nottingham Agreement. Potentially, KCC could be criticised for "fine words" not necessarily being translated into "fine actions".

8.6.3 The Select Committee found this is also backed up by evidence received from Mr Steve Waller of I&DeA, UKCIP, Carbonsense, Maidstone and Croydon Borough Councils, who all demonstrated excellent examples of "Best Practice" elsewhere. (See section 8.3 for details).

8.6.4 **Recommendation 11:** Clarify political and managerial leadership and accountability on climate change within KCC.

The Select Committee recommends that KCC should:-

1. Identify a leading member of the Administration to be responsible for climate change policy.

2. Ensure climate change is included in corporate risk planning, business continuity and all directorate plans and policies[169].

3. Challenge management arrangements for addressing climate change within KCC to ensure directorates:-

- Recognise climate change is an issue for all.
- Dedicate resources to climate change issues.
- Co-ordinate climate change activity.
- Communicate to staff the impact of climate change and the need to adapt and mitigate.

8.7 Climate Change Education

8.7.1 The Select Committee was keen to take evidence from a young Kent resident for their views on climate change education and was fortunate to receive evidence from Miss Becky Ribbens, aged 16 and a member of the Kent Youth County Council. Miss Ribbens evidence had a lasting impact on the Select Committee, dramatically reinforcing the importance of climate change for future generations, who will have to live with the long-term impacts.

8.7.2 Miss Ribbens told the Select Committee that before attending a KCC Local Board meeting in Dartford she was largely unaware of the likely impacts of climate change and the fact that they could have such a direct and significant

[169] An example of this can be found in the work that Devon County Council has undertaken. See section 5 and Devon CC's climate change strategy report at http://www.devon.gov.uk/climate-change-strategy.pdf

impact on the future of her community and her generation[170]. The Select Committee was pleased to note Miss Ribbens and the Kent Youth County Council has subsequently set up an awareness campaign[171].

8.7.3 Miss Ribbens commented that she was deeply concerned, as was the Select Committee, at how little time was devoted to the issue within the school environment[172]. Indeed, the Select Committee noted that climate change education currently was part of the PSHE curriculum[173]. Whether or not the issue received any attention seemed entirely down to the preferences of individual teachers and school governors who are responsible for the school curriculum.

8.7.4 The Select Committee appreciates that there will be many interest groups who feel that the issues which concern them should form a more prominent part of the school curriculum. The Select Committee also recognises the constraints on what can and can not be brought into the curriculum. However, the Select Committee makes no apology for proposing that climate change and the issues arising from it take a more prominent position in schools and in learning environments generally.

8.7.5 At the heart of our education system is the need to prepare young people for the future and help them acquire the skills needed to thrive. If, as the Government's chief scientist Sir David King believes, climate change is the greatest threat

[170] Evidence received at the hearing on 26 April, see paragraph 1 *et seq*.

[171] Evidence received at the hearing on 26 April, see paragraph 11.

[172] Evidence received at the hearing on 26 April, see paragraph 12 *et seq*.

[173] Evidence received at the hearing on 26 April, see paragraph 2 and 12.

future generations will face including that of international terrorism[174], it is vital that education gives Kent's children the information and advice they will need to understand the implications and reduce the risks. Indeed, the Select Committee regards it is an essential and logical extension of the widespread desire to integrate schools more effectively into the communities they serve. The Select Committee believes the potential to raise public awareness through educating children on the impact of climate change should not be underestimated.

8.7.6 **Recommendation 12:** Improve education on climate change impacts

The Select Committee recommends that:-

1. KCC raise climate change awareness in young people within and beyond schools to show what they can do to reduce risks to future generations and to adapt to the changes which are coming.

2. The Children, Families and Education directorate produces a report to Cabinet on how climate change education can best be advanced in Kent's schools.

[174] See: http://www.climatesoutheast.org.uk/viewquotes.php

9 Conclusion

9.1 Looking back

9.1.1 At the outset of this topic review, Mr Peter Moore, KCC's Environment Strategy Manager, suggested to the Select Committee that the degree of acceptance of climate change could be likened to the stages of 'the grief cycle'.

9.1.2 This cycle details the stages of emotional response that an individual goes through over time in reaction to bad news[175]. This cycle begins with paralysis, progressing through denial and anger and ultimately to acceptance and the desire to move forward constructively.

9.1.3 Members of the Select Committee each began the inquiry at different stages on this cycle but ended it with clear and unanimous acceptance that climate change above and beyond that which can be explained by natural variation is happening and accelerating and that human activity is, at least in part, responsible. This is matched by a desire to ensure that KCC and Kent as a whole move rapidly towards a constructive, appropriate and adequate response to the many challenges which climate change represents. All Members of the Select Committee hope that the considered recommendations in this report will drive KCC and Kent to achieve this.

[175] This well known cycle was developed by Dr Elizabeth Kübler-Ross, a Swiss Psychiatrist. See: http://changingminds.org/disciplines/change_management/kubler_ross/kubler_ross.htm

9.2 Final Conclusions

9.2.1 In conclusion and presenting the recommendations in this report, the Select Committee strongly emphasises:

- That, as a County, Kent has more to lose than most in the United Kingdom from climate change and thus has a particularly strong incentive to reduce our contribution to it and adapt to its impacts.

- That the costs of responding to climate change will ultimately be marginal compared to the costs of inaction.

- That while KCC's direct influence on climate change may seem limited, we can with our partners exert a massive indirect influence by leading the community to a deeper understanding of risk and a more effective response.

- That the effectiveness of KCC's response to climate change will be greatly enhanced if pursued in partnership with other tiers of government. However, KCC should not shrink from conflict with those tiers if their policies undermine our efforts to combat climate change.

- That the cross-party consensus behind this report demonstrates that climate change is an issue which transcends party politics, and that in responding to this report and implementing its response to climate change, Cabinet and opposition parties must work together to maintain this cross-party consensus.

- That the credibility of KCC's efforts to raise awareness and encourage action depends fundamentally on leading by example in reducing emissions and adapting to climate change, not just within KCC's own estate, but in the decisions that KCC takes and the proposals to which we give our support throughout Kent.

10 Glossary

TERM / ABBREVIATION	DEFINITION
Adaptation	Adaptation can be defined as "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. *Climate Change 2001: Impacts, Adaptation and Vulnerability, Annex B,* Intergovernmental Panel on Climate Change, see: http://www.grida.no/climate/ipcc_tar/wg2/index.htm
BSF Programme	The Building Schools for the Future Programme.
BREEAM	Buildings Research Establishment Environmental Assessment Method. (The most widely recognised and used measure of environmental design and management in the construction and property sectors, and increasingly specified in public sector procurement as a minimum standard).
Carbon Sinks	Forests and other ecosystems that absorb carbon, thereby removing it from the atmosphere and offsetting carbon dioxide emissions.
Climate Change	Whilst a definitive term for climate change can be found[176], in the course of receiving evidence the Select Committee noted the following evidence:-

[176] ""Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural

TERM / ABBREVIATION	DEFINITION
	"*The term 'climate change' is sometimes used to refer to all forms of climatic inconsistency, but because the Earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term 'global warming'. Scientists however, tend to use the term in the wider sense to also include natural changes in the climate"*[177]*.* The Select Committee found that the evidence in Appendix 2 was important to understand and emphasise the relationship between human activities and climate change.
DCLG	Department for Communities and Local Government
DEFRA	Department for the Environment, Food and Rural Affairs
ECSC	The Energy Conservation and Solar Centre
ERPOC	KCC's Environment and Regeneration Policy Overview Committee.

climate variability observed over comparable time periods. " *United Nations Framework Convention on Climate Change* definition.

See www.unfccc.int/essential_background/convention/background/items/2536.php.

[177] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy*. Report submission to the KCC Select Committee on Climate Change by Mr Peter Moore. KCC Environment Strategy Manager, March 2006.

TERM / ABBREVIATION	DEFINITION
Greenhouse Gases	In the course of receiving evidence the Select Committee noted the following evidence as a definition of Greenhouse Gases[178]: "Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the *greenhouse effect*. Water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances which are dealt with under the Montreal Protocol. Beside CO_2, N_2O, and CH_4, the *Kyoto Protocol* deals with the greenhouse gases sulphur hexafluoride (SF_6), hydro fluorocarbons (HFCs) and perfluorocarbons (PFCs)".
I&DeA	The Improvement and Development Agency
IPCC	Inter-Governmental Panel on Climate Change.
KCC	Kent County Council

[178] See: *Climate Change 2001: Impacts, Adaptation and Vulnerability, Annex B,* Intergovernmental Panel on Climate Change, see www.grida.no/climate/ipcc_tar/wg2/index.htm.

TERM / ABBREVIATION	DEFINITION
KMSP	Kent and Medway Structure Plan. (This was adopted in July 2006).
LTP	Kent County Council's Local Transport Plan (2006-2011).
Mitigation	Mitigation can be defined as "an intervention to reduce the sources or enhance the sinks of greenhouse gases, *Climate Change 2001: Impacts, Adaptation and Vulnerability, Annex B,* Intergovernmental Panel on Climate Change, see: http://www.grida.no/climate/ipcc_tar/wg2/index.htm
Netcen	The National Environmental Technology Centre[179].
ODPM	Office of the Deputy Prime Minister - now superseded by the Department for Communities and Local Government (DCLG)
SPPOC	Strategic Planning Policy Overview Committee.
UKCIP	United Kingdom Climate Impacts Programme.
UKCIP02 Scenarios	Climate change scenarios for the United Kingdom published by UKCIP in 2002 (for further details, please see: http://www.ukcip.org.uk/resources/publications/documents/UKCIP02_briefing.pdf . These are the latest available scenarios and are due for revision in 2008 (these scenarios are the UKCIPnext scenarios. See: http://www.ukcip.org.uk/scenarios/ukcipnext/what_is_ukcipnext.asp).

[179] For further details, see http://www.netcen.co.uk/index.php

TERM / ABBREVIATION	DEFINITION
SECCP	South East Climate Change Partnership.
SUDS	Sustainable Urban Drainage Systems. (Sustainable drainage is the practice of controlling surface water runoff as close to origin as possible, before it is discharged to a watercourse or to ground. This involves moving away from traditional piped drainage systems to softer engineering solutions that are closer to their natural drainage regimes. This helps to promote wider environmental objectives. As such, SUDS are a system for the process for achieving integrated water drainage design. For further details, please see: http://www.environment-agency.gov.uk/commondata/acrobat/suds_policy.pdf).

11 List of Witnesses

11.1 List of Witnesses Who Submitted Oral Evidence

Date	Name	Position and Organisation
Monday 3 April 2006	Mr Peter Moore	KCC Environment Strategy Manager
Monday 3 April 2006	Mr Keith Ferrin	KCC Cabinet Member for Waste, Highways, Planning and Environment
Monday 3 April 2006	Mr Graham Gibbens	KCC Cabinet Member for Regeneration and Supporting Independence
Monday 10 April 2006	Mr Eddy Taylor	Environment and Sustainability Team Manager, Croydon Council.
Monday 10 April 2006	Mr Laurence Tricker	KCC Countryside Partnerships Manager
Monday 10 April 2006	Mr Mark Goldthorpe	Programme Manager, SE Climate Change Partnership
Wednesday 12 April 2006	Mr Peter Martin	Research Director, Carbon**sense**
Wednesday 12 April 2006	Mr John Archer	Environment and Land Use Adviser, National Farmers Union
Wednesday 12 April 2006	Mr Daniel Salisbury	KCC Sustainable Construction Advisor

Date	Name	Position and Organisation
Wednesday 12 April 2006	Mr Rob Shaw	Policy Manager, Town and Country Planning Association.
Wednesday, 26 April 2006	Mr Nick Rowe	KCC Head of Emergency Planning.
Wednesday, 26 April 2006	Mr Jim Boot	Community Planning Co-Ordinator, Maidstone Borough Council.
Wednesday, 26 April 2006	Miss Becky Ribbens	Member, Kent Youth County Council.
Friday, 28 April 2006	Mr Neil Gunn	Flood Risk Management Team, Environment Agency.
Friday, 28 April 2006	Mr Frank Heeley	Water Resources Team, Environment Agency.
Friday, 28 April 2006	Mr Richard Moyse	Head of Conservation and Policy, Kent Wildlife Trust.
Friday, 28 April 2006	Ms Wendy Goddard	Strategic Support Manager, Creative Environmental Networks.
Friday, 28 April 2006	Mr Mick Sutch	KCC Head of Transport Stragegy and Planning.
Friday, 28 April 2006	Mr Mike Austerberry	KCC Director of Property, Property Group.
Friday, 28 April 2006	Mr Steve Bell	KCC Professional Services Manager, Property Group.

Date	Name	Position and Organisation
Wednesday, 3 May 2006	Mr Peter Jones	Director, Biffa Waste Services.
Wednesday, 3 May 2006	Mr Gerry Metcalf	Knowledge Transfer Manager, UK Climate Impacts Program.
Wednesday, 3 May 2006	Mr Laurie Newton	Local Authority Project Officer, UK Climate Impacts Program.
Wednesday, 3 May 2006	Mr Steve Waller	Principal Consultant, Improvement and Development Agency.
Wednesday 10 May	Mr Neil Turner Select Committee saw various renewable energy projects organised by CEN. The witnesses below demonstrated their projects: Mr and Mrs R Purnell. Mr Peter Leutner. Mr Peter Smith Mr John Leigh – Pemberton.	Creative Environmental Networks. Petham Village Hall - Chief Executive, The Wildwood Trust. -

Date	Name	Position and Organisation
Monday, 15 May 2006	Mrs Carolyn Mckenzie	KCC Corporate Environmental Performance Group
Monday, 15 May 2006	Mr Andy Morgan	LASER Energy Manager, KCC Commercial Services
Monday, 15 May 2006	Mr Kevin Harlock	Director, KCC Commercial Services
Monday, 15 May 2006	Professor Roger Vickerman	Jean Monnet Professor of European Economics, University of Kent.
Monday, 15 May 2006	Mr John Thorp	Managing Director, Energy Conservation and Solar Centre.

11.1.1 Some of the above witnesses also submitted evidence to the Select Committee in response to further follow up questions raised.

11.2 <u>List of Written Evidence Received</u>

11.2.1 The following submitted responses to requests for written evidence:

- Ashford Borough Council.
- Tunbridge Wells Borough Council.
- Tonbridge and Malling Borough Council.
- The Kent Partnership.
- The London Climate Change Agency.
- The Royal Society for the Protection of Birds.
- English Nature.
- Mr Dick Feasey, KCC Development Planning Manager.
- Ms Sarah Weston, KCC Kent Eco-Schools Officer.

12 Appendix 1 – Evidence From the Public

12.1 Background to Evidence

12.1.1 For the first time in a Select Committee process within Kent County Council, the public were able to add their comments directly through Local Board meetings in Dartford, Thanet and Shepway where climate change was the topic of discussion in Spring 2006.

12.1.2 Members of the public were also able to contribute by completing an answer to the question “Name one thing that you think KCC should be doing to tackle climate change”.

12.2 Responses Received from Members of the Public

12.2.1 The Select Committee received the following direct responses:

- *"Encouraging and promoting energy saving projects across Dartford."*
- *"Promoting walking and cycling and informing people about pollution problems."*
- *"Informing people on the actual facts, tackling recycling and having a festival to do with pollution."*
- *"Explaining to people how to save energy and how they are currently wasting energy. Basically making people more aware of how they use and waste energy."*
- *"Encourage environmental changes in schools (e.g. Screensavers on computers, switching lights off when not in use etc) to save energy."*

- *"I personally think that the KCC should lower the bus fares. By doing this, more people will be using the bus, and less car transport will be used. This will help the environment greatly."*

- *"I think one of the main things is the cars and the pollution, the KCC could make some kind of congestion charge locally or something like that."*

- *"Inaugurate a special education programme for both primary and secondary schools to inform and educate all students about global warming."*

- *"Education - early age"*

- *" I personally think that awareness should be raised throughout the community about how life's necessities which produce carbon dioxide e.g. running water, leaving TV/Stereo on standby etc…Also, bus fares should be lowered to encourage members of the community to use public transport and reduce the amount of people using their cars, which is a big contributor to global warming."*

- *"Congestion charging and cheaper transport".*

- *"Buy fruit & veg from England or nearby Europe, especially when it is in season, because that should reduce the number of carbon dioxide emissions produced by airplanes transporting it".*

- *" Talking to Young People! Young people like myself need to know what is happening and how they can help! I did not know the extremes of the problem and many young people still don't. There are approx. 120,000 young people in Kent and a lot of them want to help. Education is the key, if you educate us, we are going to pass it on to others and really make a difference."*

- *"Cut back on planned overcrowding in the South East (1.7 million dwellings) particularly in the Thames Gateway".*

- *"Improve roadside recycling (but also put pressure on companies to reduce the plastic / card packaging!)".*

- *"Pilot renewable energy schemes that people can observe what is achievable and how much can be saved. If people begin to realize that others are paying less than they pay, they will seek change for themselves".*

- *"Require all developers to employ renewable energy, to source their materials locally and to design for collective projects (rainwater harvesting)".*

- *"Maximum use of renewable energy in all new developments"*

13 Appendix 2 – Evidence and Scenarios of Climate Change

13.1 Background and key findings of the Scientific Evidence of Climate Change.

13.1.1 The Select Committee took a wide variety of scientific evidence, primarily from the UK Climate Impacts Program ("UKCIP"), the South East Climate Change Partnership (both of which are government-supported bodies), as well as from Carbon**sense** and from Peter Moore, KCC's Environmental Strategy Manager.

13.1.2 The most striking facts that the Select Committee found from the scientific evidence presented can be summarised as follows:

13.1.3 Climate change is unavoidable over the next 30 to 40 years[180], due to historic emissions of "Greenhouse Gases"[181]. This is why adaptation needs to be considered now.

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[180] See *Climate Change Scenarios for the United Kingdom – The UKCIP02 Briefing Report,* www.ukcip.org.uk

[181] An explanation of the term "Greenhouse Gases" is as follows: "Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the *greenhouse effect*. Water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances which are dealt with under the Montreal Protocol. Beside CO_2, N_2O, and CH_4. The *Kyoto Protocol* deals with the greenhouse gases sulphur hexafluoride (SF_6), hydro fluorocarbons (HFCs) and perfluorocarbons (PFCs)". *Climate Change 2001: Impacts, Adaptation and Vulnerability, Annex B,* Intergovernmental Panel on Climate Change, see www.grida.no/climate/ipcc_tar/wg2/index.htm.

13.1.4 In addition, the impact of climate change in the period beyond that will be determined by the action taken now to reduce the impact of climate change. This is why mitigation needs to be considered now.

13.2 International Scenarios

13.2.1 International concern on the impact of climate change has existed for some years and as a result of this concern, in 1988 the Inter-governmental Panel on Climate Change was formed under the auspices of the United Nations[182].

13.2.2 Scientific evidence was presented to the Select Committee on trends in global climate and the use of computer models in the formation of international climate change scenarios was noted. The evidence received by the Select Committee showed that it was only when both natural and human factors were included could computer models, such as that used by the IPCC[183] to explain past trends in global climate, accurately reflect the course of global-average temperature since 1860 and especially the warming since the 1970's[184]. As the IPCC noted in their third assessment report:

> *"Most of the warming observed over the last 50 years is likely to have been due to increasing concentrations of greenhouse gases"*[185]

[182] See: www.ipcc.ch/about/about.htm.

[183] The Inter-Governmental Panel on Climate Change. See note 182 *supra.*

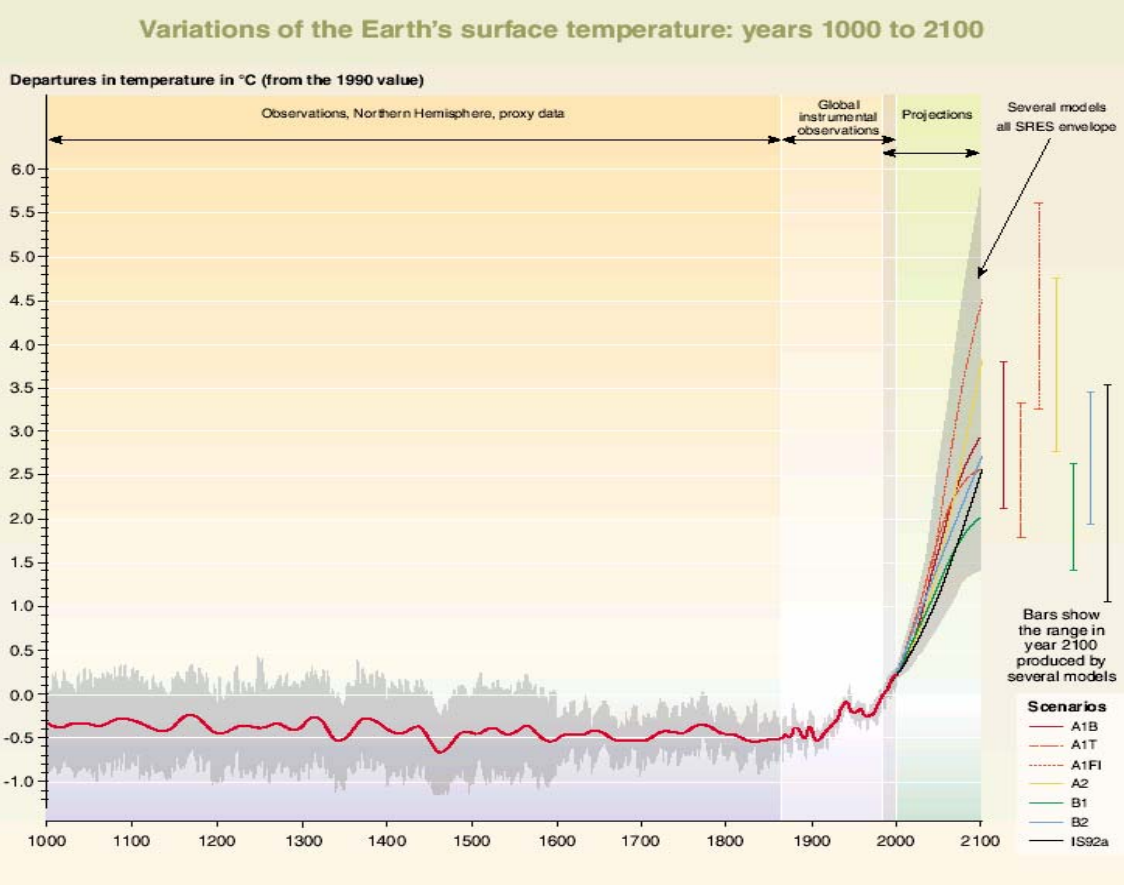
[184] See note 182 *supra*

[185] *Climate Change Scenarios for the United Kingdom – The UKCIP02 Briefing Report*, page 5. See: www.ukcip.org.uk

13.2.3 How climate changes in the future depends on future emissions of greenhouse gases and other pollutants, which in turn depend upon how population, economies, energy technologies and societies develop.

13.2.4 The Select Committee also noted a timeline graph showing an upward curve in global average temperature (usually referred to as the "Hockey Stick" or "J-Curve") demonstrating the impact climate change is having now and is expected to have in the future. This is often referred to in the media in the climate change debate. This is shown in Table 13.2.5[186].

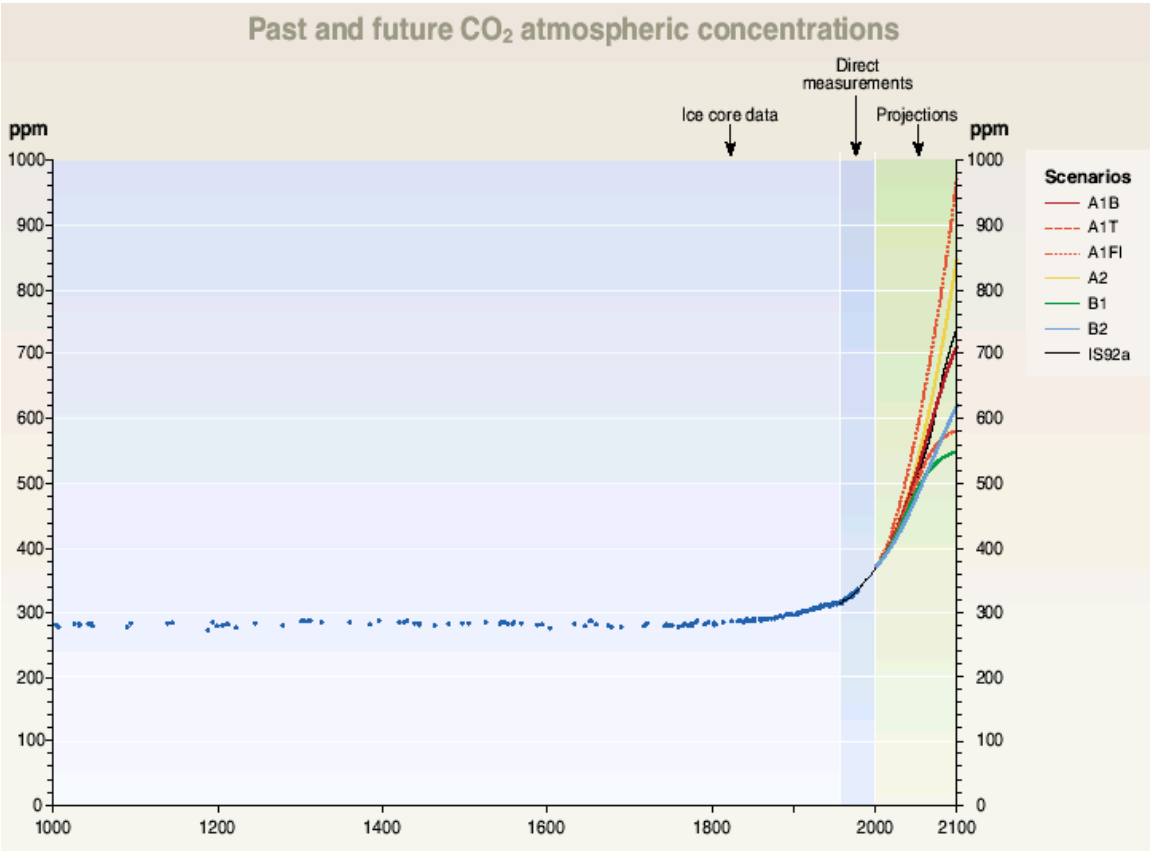
13.2.5 **Table 13.2.5**: "Hockey Stick" graph showing rise in global average temperature



[186] Evidence received from Peter Moore, KCC Environmental Strategy Manager and Mark Goldthorp of the South East Climate Change Partnership at the hearings on 3 April and 10 April 2006 respectively.

13.2.6 In addition, atmospheric concentrations of carbon dioxide show a similar correlation as indicated in Table 13.2.7[187].

13.2.7 **Table 13.2.7**: Graph showing rise in carbon dioxide atmospheric concentrations.



[187] See note 186 *supra*.

13.3 National Scenarios

13.3.1 In the UK, climate change has also been an issue of concern and in 1997 the UK Climates Impacts Programme ("UKCIP") was formed[188].

13.3.2 The UK Climates Impacts Programme has taken some of the range of projections of possible future emissions from the IPCC Special Report on Emissions Scenarios[189] projections and in conjunction with the Hadley Centre[190] global climate model, developed a European regional climate model, which has a resolution of 50km grid squares[191]. From this, 4 UKCIP02 Climate Change Scenarios were developed and are summarised in Table 13.3.3.

[188] See www.ukcip.org.uk.

[189] *Climate Change Scenarios for the United Kingdom – The UKCIP02 Briefing Report*, page 6.

[190] The Hadley Centre for Climate Prediction and Research (part of the Met Office). For further information see www.metoffice.com/research/hadleycentre

[191] The Select Committee noted that the 50km grid square covering parts of East Kent did not have any data. This was because this 50km grid square contained more sea than land. (Squares are classified on the basis of whether land or sea predominates as land and sea squares are calculated differently by the Hadley Centre). However, UKCIP advice is that as a general rule, the land mass reading for these 50km squares can be considered the same as the adjacent land mass square. See *Climate Change Impact for Kent, the impacts of climate change on Kent's environment, society and economy*. Report submission to the KCC Select Committee on Climate Change by Peter Moore. KCC Environmental Strategy Manager, March 2006.

13.3.3 **Table 13.3.3:** UKCIP02 Climate Change Scenarios ("The Scenarios")[192] for the 2080's.

UKCIP02 Climate Change Scenario	**Increase in Global Temperature (ºC)**	**Atmospheric Carbon Dioxide concentration (Parts Per Million (PPM))**
Low Emissions	2.0	525
Medium-Low Emissions	2.3	562
Medium-High Emissions	3.3	715
High Emissions	3.9	810

13.3.4 The Select Committee received evidence that The Scenarios are due to be updated in 2008[193].

13.3.5 The Select Committee received evidence that the European Union regards an increase in Global Temperature of above 2 degrees Celsius as "unsafe" and that when the UK held the chair of the G8, agreement was being sought to aim for Atmospheric Carbon Dioxide concentration of less than 550 PPM[194]. This would indicate that the "Low Emissions" UKCIP02 climate change scenario should be aimed for in order to mitigate the impact of climate change in the future.

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[192] See note 188 *supra*

[193] *Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy, page 11*. Report submission to the KCC Select Committee on Climate Change by Peter Moore. KCC Environmental Strategy Manager, March 2006.

[194] Evidence from Peter Moore, KCC Environment Strategy Manager at the hearing on 3 April 2006.

13.3.6 There is however an inherent uncertainty in identifying future climate change impacts. The Select Committee in preparing this report accepts that the most robust assessments of future impacts of climate change rely on scenarios that cover a range of possibilities, as detailed in section 13.3.2.

13.3.7 For this reason, the Select Committee regards the resources available to the UK Climate Impacts Program (which is supported by research and resources of the Hadley and Tyndall[195] Centres, as well DEFRA[196]) as such that the evidence presented by it should be relied upon to formulate recommendations at the strategic level, such as in the report. The Select Committee acknowledges that further Kent-specific research may be required to 'fine-tune' the implementation of policy and priorities at local level.

13.3.8 Based on the scenarios in Table 13.3.3, the Select Committee was presented with further evidence on the impact of climate change. These are discussed elsewhere in the main report as appropriate.

13.3.9 The Select Committee accepts the overwhelming scientific consensus that climate change is happening. As a result of this, the Select Committee suggests that tough decisions will have to be taken to deal with the impact of climate change and whilst some of the most dramatic predicted effects may appear some way off in the future these decisions must be taken now.

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[195] The Tyndall Centre for Climate Change Research. For further information, see www.tyndall.ac.uk/index.shtml

[196] The Department for the Environment, Food and Rural Affairs. For further information, see www.defra.gov.uk/environment/climatechange/index.htm.

14 Appendix 3 – Impacts of Climate Change

14.1 National Climate Change Impacts

14.1.1 The scientific evidence on the impact climate change is discussed in Appendix 2.

14.1.2 Based on the 4 UKCIP02 scenarios referred to in Table 13.3.3, the Select Committee received evidence suggesting forecast effects in the 2020's, 2050's and the 2080's as indicated in Table 14.1.3.

14.1.3 **Table 14.1.3** – Key UK climate impacts based on the UKCIP02 scenarios[197]

Item	Year	Climate impact
Warming	2020's	Increase of 0.5 - 1.5ºC
Warming	2050's	Increase of 0.5 - 3.5ºC
Warming	2080's	Increase of 0.5 – 5.0 ºC
Winters	2020's	Up to 10% wetter
Winters	2050's	Up to 20% wetter
Winters	2080's	Up to 40% wetter
Summers	2020's	Up to 20% drier
Summers	2050's	Up to 40% drier
Summers	2080's	Up to 60% drier
Sea levels	2020's	Rise of 4 - 14 cm
Sea levels	2050's	Rise of 7 - 36 cm
Sea levels	2080's	Rise of 9 – 69 cm

[197] See *Climate Change Scenarios for the United Kingdom – The UKCIP02 Briefing Report,* http://www.ukcip.org.uk/resources/publications/pub_dets.asp?ID=14. For sea-level rises, see http://www.ukcip.org.uk/scenarios/ukcip02/documentation/documents/UKCIP02_Ch6.pdf. These impacts were similarly evidenced by Mark Goldthorpe of the South East Climate Change Partnership at the hearing on 10 April 2006 and by Gerry Metcalfe of UKCIP at the hearing on 3 May 2006.

14.1.4 The Select Committee also received similar evidence on key south east climate impacts based on the UKCIP02 Scenarios. This is discussed in section 14.3.3. Further regional variations on the climate impacts above are discussed in section 14.3.

14.2 National Government Policy Context on Climate Change

14.2.1 The UK Government has for some years been involved in climate change policy at the International level, for example through the IPCC[198] and the G8[199].

14.2.2 Within the UK, government policy on climate change involves national government departments (for example the Department for the Environment, Food and Rural Affairs (DEFRA)[200] and the Environment Agency[201]) and through supporting the work of both the South East Climate Change Partnership[202] and UKCIP[203] as well as the Information and Development Agency ("I&DeA")[204].

14.3 Regional Climate Change Impacts

14.3.1 The Select Committee received evidence from the South East Climate Change Partnership (SECCP), which is a regional partnership established by stakeholders that works closely with UKCIP to co-ordinate responses to climate

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[198] The Intergovernmental Panel on Climate Change. See www.ipcc.ch

[199] The G8 is a forum for the leading 7 industrialised nations (including the UK) + Russia that discusses major global issues of the day. The UK had the presidency in 2005. See http://www.g8.gov.uk/servlet/Front?pagename=OpenMarket/Xcelerate/ShowPage&c=Page&cid=1078995902703

[200] See http://www.defra.gov.uk/environment/climatechange/index.htm.

[201] See evidence received from the Environment Agency at the hearing on 28 April 2006.

[202] See www.climatesoutheast.org.uk

[203] See www.ukcip.org.uk

change and share experiences. Its work in identifying the impact of Climate Change for the South East region is also based on the UKCIP Scenarios.

14.3.2 The Select Committee also received evidence that the South East of the United Kingdom will suffer the biggest impact of climate change in the United Kingdom[205].

14.3.3 Using the UKCIP02 Scenarios, the Select Committee received evidence suggesting forecast effects on the South East in the 2020's, 2050's and the 2080's as indicated in Table 14.3.4.

14.3.4 **Table 14.3.4**– Key South East Climate Impacts Based on the UKCIP02 Scenarios in the 2080's[206]:

Item	**Year**	**Climate impact**
Warming	2020's	Increase of 0.5 – 2.0ºC
Warming	2050's	Increase of 1.0 - 3.0ºC
Warming	2080's	Increase of 2.0 – 5.0 ºC
Winters	2020's	Up to 15% wetter
Winters	2050's	Up to 30% wetter
Winters	2080's	Up to 30% wetter
Summers	2020's	Up to 15% drier
Summers	2050's	Up to 45% drier
Summers	2080's	Up to 60% drier
Sea levels	2020's	Rise of 4 - 14 cm
Sea levels	2050's	Rise of 7 - 36 cm
Sea levels	2080's	Rise of 9 - 69 cm

[204] See http://www.idea-knowledge.gov.uk/idk/core/page.do?pageId=1

[205] Evidence received from UKCIP at the hearing on 3 May 2006.

[206] See note 197 *supra.*

15 Appendix 4 – *"Climate Change Impacts for Kent"* Report.

15.1 This report can be found in a separate document

15.1.1 The full name of this report is "*Climate Change Impacts for Kent, the impacts of climate change on Kent's environment, society and economy*. Report submission to the KCC Select Committee on Climate Change by Peter Moore. KCC Environment Strategy Manager, March 2006.