

Climate Change Mitigation and Adaptation Implementation Plan

for the Draft South East Plan



Final Report

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Prepared for South East England Regional Assembly

by

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1. BACKGROUND

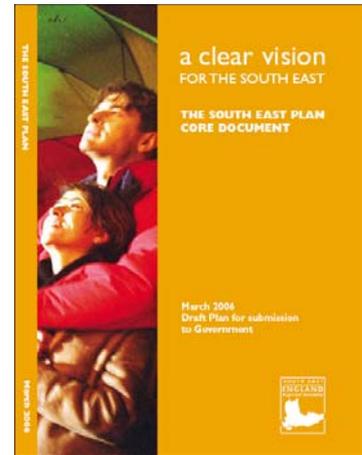
How will climate change affect the South East?

- 1.1 The South East is forecast to experience some of the most severe impacts due to climate change of any English region over the coming century. Examples of possible impacts include:
- hotter drier summers.
 - milder wetter winters.
 - a significant decrease in soil moisture content.
 - more frequent extreme high temperatures.
 - more frequent extreme winter precipitation.
 - increased storminess and wind speeds in winter.
 - net sea level rise and increase in sea storm surge height.
- 1.2 These possible impacts are explored in more detail in some of the key documents referred to below (see Box 1), especially the *Rising to the Challenge* report. The UK Climate Impacts Programme (UKCIP) scenarios illustrate how our climate might change and provide a common national reference point. Maps show the expected change in average summer and winter temperature and precipitation (see UKCIP02 Scenarios Gateway at www.ukcip.uk/scenarios > maps > seasonal climate change).
- 1.3 What is clear is that action is needed now to adapt to the impacts already happening and that are likely to happen in the future and to mitigate the causes of climate change.
- 1.4 There is clearly a close relationship between climate change and wider sustainability considerations. Whilst the Implementation Plan focuses on climate change, in terms of implementation this approach is clearly – and necessarily – partial. Issues relating to climate change overlap with, and need to be considered alongside, a whole range of other factors pertaining to sustainable development more generally, as set out in the region's Integrated Regional Framework (www.southeast-ra.gov.uk > our work > regional planning > integrated regional framework).

What is the purpose of the Climate Change Implementation Plan?

- 1.5 The overall aim of the Climate Change Implementation Plan is to develop a regional plan which sets out actions required by different organisations to mitigate and adapt to the forecast effects of climate change in the South East.

- 1.6 In particular, the Climate Change Implementation Plan aims to implement *Policy CC2: Climate Change* in the draft South East Plan as submitted by the Regional Assembly to Government on 31 March 2006 (see Box 2, Section 2). It supplements the Implementation Plan for the South East Plan which identifies the mechanisms generally required to deliver the policies and proposals set out in the South East Plan. However, due to the importance and cross-cutting nature of the climate change policy across all aspects of the Plan, it was decided to provide additional detail on its implementation. See the draft South East Plan at www.southeast-ra.gov.uk > South East Plan Website.



- 1.7 The focus of the implementation plan is on actions that are relevant to spatial planning, but it also includes those that go beyond activity controlled by the town and country planning system.

How has the draft Implementation Plan been developed?

- 1.8 The work on the Implementation Plan started in 2005 with a review of the policies in the draft South East Plan and existing policy guidance and research undertaken in the region and elsewhere. The Implementation Plan aimed to not duplicate work already undertaken, but draw together relevant actions and clarify implementation mechanisms. Once a draft set of adaptation and mitigation responses and actions had been collated, key stakeholders were consulted to obtain their input on the existing and potential actions (see Appendix 1 for a list of those that inputted).
- 1.9 The review of existing and potential actions was organised under the themes used in the draft South East Plan. The results were used to inform the preparation of the Implementation Plan and in particular the key existing and new actions needed to implement Policy CC2 and overcome the main barriers (see section 4).

What other guidance is available?

- 1.10 There is a growing volume of guidance available on climate change (see Box 1) including some specifically related to the South East, as well as national guidance, guidance produced for other regions and guidance relating to specific topics or sectors. These have provided a source of information for the Implementation Plan and should be used and referred to alongside it.

BOX 1: Key existing guidance and documents on climate change	
South East Region:	
Rising to the challenge: Impacts of climate change in the South East in the 21st Century , WS Atkins, 1999.	www.climatesoutheast.org.uk > publications > SECCP reports
Meeting the Challenge of Climate Change: Summary of the South East Climate Threats and Opportunities Research Study (SECTORS) Project: A Study of Climate Change Impacts and Adaptation for Key Sectors in South East England , report for SECCP and SEEDA, 2004.	www.climatesoutheast.org.uk > publications > SECCP reports
A Toolkit for Delivering Water Management Climate Change Adaptation Through the Planning System , prepared for the Environment Agency & South East England Regional Assembly by Land Use Consultants in association with CAG Consultants, Collingwood Environmental Planning and Wilbraham & Co., 2005.	www.southeast-ra.gov.uk > our work > regional planning > environment and waste
Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate , Three Regions Climate Change Group comprising Sustainable Development Roundtable for the East of England, London Climate Change Partnership and the South East Climate Change Partnership. Greater London Authority. 2005	www.london.gov.uk > mayor of london > sustainability > london climate change Partnership > a checklist for development
Climate Change Principles for Spatial Planning , prepared by SECCP planning sector for the South East Regional Assembly's Natural Resources and Climate Change Advisory Group, 2004.	www.climatesoutheast.org.uk > publications > policy papers
Other regions:	
Climate change impacts and adaptation: Cross-Regional Research Programme – Research study into adaptation responses to climate change for new development in the Growth Areas . Stage 1 Report. Prepared for Defra and the three Regions Climate Change Group. Land Use Consultants, CAG Consultants, Oxford Brookes and Gardiner and Theobald, 2005	www.defra.gov.uk > environmental protection > climate change > action in the UK > adapting to climate change in the UK > cross regional research programme
Living with Climate Change in the East of England Stage 2: Draft Guidance for Local Service Provision , for Hertfordshire County Council on behalf of the EERA and East of England Sustainable Development Roundtable, Land Use Consultants, CAG Consultants and SQW Limited, 2003.	www.eastofenglandobservatory.org.uk > agriculture, environment and natural resources > environmental protection > climate and weather
Strategy for Dealing with Climate Change, 2004-2007 , Environment Agency Anglian Region.	www.environment-agency.gov.uk > regions > anglian region > regional issues > anglian climate change strategy
Yorkshire and the Humber's Climate Change Action Plan , Government Office for Yorkshire and Humber, December 2005.	www.yourclimate.org
National:	
Measuring Progress – Preparing for Climate Change Through the UK Climate Change Programme , UKCIP, 2003.	www.ukcip.org.uk > resources > publications
Climate change and local communities - how prepared are you? UKCIP, 2003.	www.ukcip.org.uk > resources > publications
The Planning Response to Climate Change: Advice on Better Practice , ODPM, 2004.	www.odpm.gov.uk > planning > planning guidance and advice
Other relevant documents:	
Stabilising the ecological footprint in the South East , Summary Report, 25th May 2005, CURE, Manchester and SEI, York.	
Strategic Environmental Assessment and Climate Change: Practitioners' Guidance , prepared by Levett-Therivel Sustainability Consultants, UKCIP, Environment Agency, Environmental Change Institute, CAG Consultants Countryside Council for Wales and English Nature, 2004.	www.ukcip.org.uk > resources > publications

2. SCOPE AND COVERAGE

What is covered by the Implementation Plan?

- 2.1 The Implementation Plan provides further details of the mechanisms and activities that are already contributing to, or need to be developed, to mitigate and adapt to climate change in the South East. In particular, it focuses on implementing the principles set out in policy CC2 of the draft Plan (see below). These principles for climate change proofing were developed with the assistance of the South East Climate Change Partnership (SECCP). www.climatesoutheast.org.uk

BOX 2: Policy CC2: Climate Change

The strategy and policies of the Plan will promote measures to mitigate and adapt to the forecast effects of climate change and should be implemented through application of local planning policy and other mechanisms. Behavioural change will be essential in implementing this policy and the measures identified.

Mitigation, through reducing greenhouse gas emissions, will primarily be addressed through greater resource efficiency including:

- i. Improving energy efficiency performance of new and existing buildings and influencing behaviour of occupants
- ii. Reducing the need to travel and ensuring good accessibility to public and other sustainable modes of transport
- iii. Promoting land use that acts as carbon sinks
- iv. Encouraging development and use of renewable energy
- v. Reducing the amount of biodegradable waste landfilled.

In addition, and in respect of carbon dioxide emissions, regional and local authorities, agencies and others shall include policies and proposals in their plans, strategies and investment programmes to help reduce the region's carbon dioxide emissions by at least 20% below 1990 levels by 2010 and by at least 25% below 1990 levels by 2015. A target for 2026 will be developed and incorporated in the first review of the Plan (and no later than 2011).

Adaptation to risks and opportunities will be achieved through:

- i. Guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence
- ii. Ensuring new and existing building stock are more resilient to climate change impacts
- iii. Incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock
- iv. Increasing flood storage capacity and developing sustainable new water resources
- v. Ensuring that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed.

- 2.2 Section 4 of this Implementation Plan sets out existing and new actions organised under the ten principles in Policy CC2. Table 1 provides a guide as to which

principles are relevant to which themes and sub-themes included in the draft South East Plan.

What types of actions and activities are included in the Implementation Plan?

- 2.3 The Implementation Plan seeks to provide both an overview of the existing actions and activities to mitigate and adapt to climate change in the South East as well as to propose the key new actions and activities to address gaps in the current response. Local, regional and national actions and activities are included where they are relevant to the South East. Note that the existing actions and activities included aim to provide examples of the key responses, but are not intended to be completely comprehensive.
- 2.4 As stated above, the Implementation Plan covers both mitigation of and adaptation to climate change. The SECCP usefully summarises the overarching aims for local and regional decision takers and stakeholders, with regard to climate change, which in the South East should be to:
- work to reduce the extent of future global climate change, through effective measures to reduce net emissions of greenhouse gases within the region; and
 - work with a changing climate, through adaptation to its impacts (both risks and opportunities) within the region and to manage these for the benefit of present and future generations.

When does action need to be taken?

- 2.5 It is important to recognise that much of the change in climate over the next 30 to 40 years has already been determined by historic emissions and because of the inertia in the climate system. We therefore need to adapt to some degree of climate change whether or not future emissions are reduced.
- 2.6 Action in key areas is needed now if future solutions are to take account of climate change. Failing to take action and plan for the future could increase risk and incur higher costs as the climate changes, and remedial maintenance and renewal is required. Therefore, it is important to take a precautionary approach and adopt 'no regret' solutions, which will deliver benefits whatever the extent of climate change, such as raising awareness of flood risks or planting trees that will thrive in current and future climate conditions.
- 2.7 Climate change is a gradual process that happens over decades. Work to adapt to climate change needs to start now, but it will be a long-term process that needs to be tackled in a staged, prioritised way. It is important that different plans and policies, even if they have a relatively short planning horizon themselves before they are reviewed, fully consider the implications of climate change. Local Development

Documents (LDDs), for example, may be reviewed every three years but they set the framework for built development that may have a life of at least 50 years.

2.8 Some of the most immediate adaptation priorities fall on those responsible for planning and developing major infrastructure, such as new buildings or roads. Costs of adapting to climate change can be minimised if adaptation is:

- Built in when infrastructure is upgraded anyway.
- Built in when plans come up for review.
- Built in at the beginning rather than trying to retrofit.
- Built in before service providers are forced to act by a sudden event or mounting maintenance costs.

2.9 These types of adaptation can have a long lead in time, for example planning and building water resource developments, but this also applies to other adaptations, for example species migration and habitat creation.

Table 1: Principles for climate proofing and coverage in the Implementation Plan

Climate proofing principles	Themes and sub-themes from draft South East Plan				Cross-cutting	Economy & Tourism				Communication & Transport			Natural Resource Management							Country-side & Landscape		Cultural Heritage & the Historic Environment		Built and Urban Environment			Social, Health & Emergency Planning	
	Cross-cutting	Industry & Commerce	Construction Industry	Leisure & Tourism		Telecommunications	Travel & transport infrastructure	Ecology, Biod. & habitat	Forestry	Water resources	Flood risk	Rivers	The coast & estuaries	Energy	Soils	Air quality	Noise	Waste management	Landscape	Agriculture	Historic buildings and sites	Archaeology	Town centres	Housing	Sustainable construction	Health & Emergency Planning	Social	
Mitigation through reducing greenhouse gas emissions																												
i. improving energy efficiency of new and existing buildings	✓		✓										✓							✓		✓	✓	✓		✓		
ii. reducing the need to travel and ensuring good accessibility	✓	✓	✓	✓		✓							✓		✓							✓	✓	✓	✓	✓		
iii. promoting land use that acts as carbon sinks	✓						✓	✓		✓			✓	✓	✓			✓	✓							✓		
iv. encouraging development and use of renewable energy	✓	✓	✓				✓	✓	✓		✓	✓	✓				✓		✓			✓	✓	✓		✓		
v. reducing the amount of biodegradable waste landfilled	✓	✓	✓										✓		✓		✓		✓			✓	✓	✓		✓		
Adaptation to risks and opportunities																												
i. strategic location of development	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
ii. resilience of new and existing building stock	✓	✓	✓	✓	✓	✓			✓	✓				✓						✓		✓	✓	✓	✓	✓		
iii. sustainable drainage measures and water efficiency	✓	✓	✓	✓			✓		✓	✓	✓	✓							✓			✓	✓	✓		✓		
iv. flood storage capacity and new water resources	✓		✓				✓		✓	✓	✓	✓	✓					✓	✓				✓	✓	✓	✓		
v. flood management and migration of habitats & species	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓				✓	✓	✓	✓		

3. ROLES AND RESPONSIBILITIES

Who is the Implementation Plan relevant to?

- 3.1 While the Regional Assembly has an important role in incorporating mitigation and adaptation to climate change within the overall spatial planning context for the region and can promote good practice, it will need the support of many different decision makers and stakeholders, as well as individuals and households, to deliver the actions and activities in this Implementation Plan. These could include, for example:
- a local planning authority developing policies for their Local Development Framework (LDF);
 - a water company making decisions about major capital investments;
 - a developer deciding on the location, design and specification of the homes they build; and
 - a householder deciding on the products they purchase, the journeys they make and the water and energy they use.
- 3.2 Whilst not exhaustive, a list of those who should potential use the Implementation Plan is provided below (see Box 3). This includes those that will be influenced by the effects of climate change and those that have a part to play in delivering mitigation and adaptation responses.

BOX 3: Who should use the Implementation Plan?

- **National policy makers / central government** (e.g. DEFRA, ODPM, DTI, HM Treasury, DfES)
- **National regulators / advisors** (e.g. Environment Agency, Countryside Agency, English Nature, English Heritage, HSE, Ofwat, Met office)
- **Regional planners and policy makers** (e.g. the Regional Assembly / GOSE / SEEDA)
- **Local authorities:**
 - Chief Executives and senior managers
 - Development control officers
 - Environmental health officers
 - Spatial planning officers
 - Transport planners
 - Waste and mineral planners
 - Emergency planners
 - Local Education Authorities / Schools
 - Building and estate managers
- **Health service providers** (e.g. Primary Care Trusts)
- **Business and commerce** (including representative organisations e.g. CBI, Chambers of Commerce etc)
- **Insurance industry**
- **Construction, development and design industry** (e.g. architects, landscape architects, engineers, home builders, trade and professional bodies)
- **Agricultural and forestry industry and landowners** (e.g. NFU, farmers, Forestry Commission)
- **Land and heritage managers**
- **Utilities - water industry, energy providers, telecommunications industry**

- **Transport service providers and authorities** (e.g. rail operators, bus companies, infrastructure management - Network Rail, Highways Agency etc)
- **Waste management and disposal industry**
- **NGOs / voluntary organisations** (e.g. Wildlife Trusts, National Trust)
- **Research and academic institutions / higher and further education** (e.g. Universities, Tyndall Centre, UKCIP)
- **Tourism and leisure industry**
- **Community groups and households** (e.g. Local Strategic Partnerships)

3.3 More detail on the principal areas of influence and responsibilities of these different audiences is provided in Appendix 2 along with which themes from the South East Plan are most relevant to them. In addition, in Section 4 after the actions organised under the ten principles in Policy CC2 there are lists of the prioritised actions organised by those organisation that need to implement them (see Tables 13 to 27).

4. PRIORITY ACTIVITIES AND ACTIONS

What activities and actions are needed to implement the policy on climate change?

- 4.1 This section considers the implementation of the ten mitigation and adaptation principles included under Policy CC2 (see Box 4).

BOX 4: Mitigation and adaptation principles	
Mitigation	
i.	Improving energy efficiency performance of new and existing buildings and influencing behaviour of occupants
ii.	Reducing the need to travel and ensuring good accessibility to public and other sustainable modes of transport
iii.	Promoting land use that acts as carbon sinks
iv.	Encouraging development and use of renewable energy
v.	Reducing the amount of biodegradable waste landfilled
Adaptation	
i.	Guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence
ii.	Ensuring new and existing building stock are more resilient to climate change impacts
iii.	Incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock
iv.	Increasing flood storage capacity and developing sustainable new water resources
v.	Ensuring that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed

- 4.2 The following information is presented on each of these principles:

- What is the issue?
- How is the issue being addressed?
- What barriers need to be overcome?
- What are the priorities for action and who are the key players?

- 4.3 In addition to the five mitigation and five adaptation principles, key generic or cross cutting actions are also identified separately.

- 4.4 The details on how these issues are being addressed shows that some significant progress has been made by organisations that have identified the benefit of mitigation and adaptation and opportunities for 'win-win' strategies that also contribute to wider organisational and/or sustainability objectives. However, implementing mitigation and

adaptation to climate change is still at an early stage in the region and most progress has been made in developing knowledge and in modifying regional policies, strategies and plans. These provide the framework within which mitigation and adaptation can be delivered, but local mechanisms and commitment is needed to overcome perceived barriers in making progress.

- 4.5 The rationale for including the priorities for action under the ten principles includes: those which represent limited / no regret options; the scale of the opportunity in the South East either reflecting the scale of proposed economic and built development etc or the areas of most risk of significant climate change impact; the timescale required, focussing on those where action is needed now; and the actions needed to overcome the key barriers identified. At the end of Section 4 more information is included on which organisations need to undertake which actions.

What are the key barriers to implementation?

- 4.6 There are many potential barriers to implementation, including uncertainty and a lack of consensus around certain issues (both in terms of evidence and potential solutions), as well as a lack of awareness and will amongst certain stakeholders. The following barriers and problems include those identified in the literature and those mentioned by stakeholders (see Box 5). Whilst most are generally applicable, some may be more relevant to specific sectors or stakeholders:

BOX 5: Potential barriers to implementation

- Uncertainty about the nature and extent of climate change and its impacts.
- The complexity and challenges of climate change impacts and the adaptation message.
- The short planning horizons of many stakeholders compared to those of climate change.
- Resource constraints and the perception of additional costs of adaptation and mitigation.
- The fact that climate uncertainty is not treated in the same manner as other uncertainties, e.g. economic uncertainties.
- Lack of the maturity of certain markets for goods and services to support adaptation.
- Dependency by some stakeholders on regulations, codes and standards which have not yet been revised to reflect anticipated climate conditions.
- The perception that there is an absence of any useful precedents or examples of adaptation (best) practice in certain sectors.
- The fact that adaptation is case-specific, and there are no 'easy answers'.
- The perception that the business case for adaptation has not been proven in some sectors.
- The lack of senior management 'buy-in' and/or political support for adaptive response.
- Lack of awareness and in-house expertise.

- Organisational and professional inertia leading to inflexibility and resistance to change.
- Lack of perception of there being a problem by the public and at the household level and that individually they cannot make a difference.
- Difficulties associated with changing individuals' behaviour.
- Lack of joined up policy within and between different levels of decision making (e.g. national, regional and local).

How should the mitigation and adaptation principles be implemented?

- 4.7 The remainder of this section presents details on how each of the ten mitigation and adaptation principles under Policy CC2 should be implemented. In addition, key generic or cross cutting actions are also identified in a separate section presented first. Note that there is a degree of overlap between some of the principles and to clarify which issues are considered under which principle, the scope is described in the introduction sections – *'what is the issue?'*.

Cross-cutting mitigation and adaptation responses

What is the issue?

Climate change is one of the key cross-cutting policy issues included in the draft South East Plan. This is a reflection of the fact that climate change will affect many facets of development and land use and that mitigation and adaptation will increasingly need to be identified across all aspects of the Plan.

This section, therefore, considers some of the key activities and actions which are relevant across several or all the sectors and / or themes dealt with in the Plan and the principles under policy CC2. However, it should be noted that many of the issues dealt with under the individual principles are also relevant to and have implications for other principles and should be read with that context.

How is the issue being addressed?

Research data collection and monitoring

There are many examples of ongoing research into climate change and the South East Climate Change Partnership's (SECCP) inaugural Research Forum attracted some 29 researchers from a wide variety of disciplines and institutions.

Existing monitoring is undertaken by several organisations and reported on a regular basis, for example the Regional Assembly's Integrated Regional Framework¹, Countryside Agency's State of the Countryside in the South East² and Environment Agency's State of the Environment in the South East³, and all these include data relevant to climate change (see section 5).

Awareness raising and building partnerships

Defra has initiated a climate change communications initiative⁴ to improve public awareness of climate change and the need to adapt. At a regional level the SECCP coordinates and brings together stakeholders investigating, informing and advising on the threats and opportunities arising from climate change impacts in the South East⁵. Examples of raising awareness and planning for climate

Example 1: Research on changing behaviour - ChangeLAB Learning for Sustainable Living

ChangeLAB is an exciting new project about changing lifestyles, attitudes and behaviour. European partner organisations will share experience and knowledge on how to promote sustainable patterns of consumption in order to help solve increasingly serious environmental problems at home and worldwide. ChangeLAB is co-ordinated by Surrey County Council and has seven partners in Estonia, Greece, Italy, the Netherlands, Sweden and the UK (including Hampshire Country Council), together with the Regional Environmental Center for Central and Eastern Europe.

Growing prosperity in Europe has contributed to unsustainable consumption levels in relation to fossil fuels, waste and water use. There is an urgent need for policies and initiatives that encourage, motivate and influence people to think about, and take responsibility for, their behaviour and lifestyle. This is against a background of more European and national regulation and target setting to improve environmental practices and make sustainable development an integral part of all policy areas.

The challenge for the organisations taking part in the ChangeLAB project, mainly local and regional authorities, is how to reduce forms of consumption which damage the environment, without reducing quality of life and prosperity. ChangeLAB will assist politicians and policymakers by creating a base of knowledge and a better understanding about the effectiveness of a wide variety of policies and projects that aim to influence behaviour and arrest unsustainable trends at local and regional level.

The project will run until the end of December 2007, after which a Europe-wide network of interested organisations and individuals will continue to share experiences. The project is part-funded by the Interreg IIIC programme, which promotes exchange of experience and cooperation on solving shared problems. Interreg IIIC is financed by the European Regional Development Fund (ERDF).

See ChangeLAB website at: www.changelabproject.org

¹ Integrated Regional Framework www.southeast-ra.gov.uk > our work > regional planning > sustainable development

² State of the Countryside in the South East www.countryside.gov.uk > publications > articles > CA193

³ www.environment-agency.gov.uk > regions > southern > state of the environment report 2005

⁴ www.climetechallenge.gov.uk

⁵ www.climatesoutheast.org.uk

change at a local level include the Manhood Peninsular project⁶ (part of ESPACE⁷) which is working with local residents and businesses to plan for the future taking account of the effects of climate change. Across the whole of West Sussex the ESPACE project is also working to raise awareness of climate change and how to adapt, this includes running workshops with schools, businesses and local communities.

Developing policy and strategy

There are many examples of existing initiatives to develop climate change policy and strategy, for example (also see section 1.9):

- The Regional Assembly and Environment Agency have developed a practitioners guide to delivering water management climate change adaptation through the planning system as part of the ESPACE project which they are promoting to local authorities, developers etc⁸.
- The Environment Agency is committed to preparing climate change strategies for each of its regions, this will include Thames and Southern regions in the South East.
- ODPM has produced advice on the planning responses to climate change. This is aimed at planning professionals and provides an overview of the current thinking and state of knowledge on the planning response to climate change⁹.
- The Three Regions Climate Change Group has produced a checklist for development adapting to climate change. This guidance is designed to highlight to developers, their design teams, architects and investors as well as policy makers the need for developments to be “climate proofed” at the outset to our changing climate¹⁰.
- The Improvement and Development Agency (I&DeA) website provides information on climate change, including the key priorities for community strategies and taking forward work on climate change in the community¹¹.
- UKCIP has produced a short guide for local authorities addressing the questions which councils should ask themselves on how climate change could affect all their services and functions¹².
- The Local Government Association (LGA) has produced a long term vision of how local government can play an essential role in adapting to the impacts of climate change, with the Energy Saving Trust and Energy Efficiency Partnership for Homes¹³.

Example 2: Woking Climate Change Guide and Checklist

Woking Borough Council has adopted ‘Climate Neutral Development – A good practice guide’, endorsed by the UK Climate Impacts Programme and the South East England Climate Change Partnership. The five-point approach includes guidance on both mitigation (energy, location and transport, site layout and building design) and adaptation to climate change. Adaptation advice focuses on water conservation /recycling and sustainable drainage, and addresses maintenance and costs implications. The guidance includes a useful summary of good practice and an applicants’ checklist which applicants are asked to fill in and submit with their planning application.

See Woking website at www.woking.gov.uk > AZ of Services > Planning > Planning Publications > Climate Neutral Development

⁶ www.climateforchange.org.uk

⁷ The ESPACE Interreg IIIB project aims to identify and implement measures to adapt to climate change in spatial planning (see www.espace-project.org).

⁸ A Toolkit for Delivering Water Management Climate Change Adaptation Through the Planning System www.southeast-ra.gov.uk >our work > regional planning > environment and waste

⁹ The planning responses to climate change: advice on better practice www.odpm.gov.uk > planning > planning guidance and advice

¹⁰ Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate www.london.gov.uk > mayor of london > sustainability > london climate change partnership > a checklist for development

¹¹ www.idea-knowledge.gov.uk > improving your council > sustainable communities > environment > climate change and energy

¹² Climate change and local communities – how prepared are you? www.ukcip.org.uk > resources > publications

¹³ Leading the way: how local authorities can meet the challenge of climate change www.lga.gov.uk > our work > projects > sustainable energy & climate change vision local's government's role

Priorities for actions	Key players
construction, these should be updated to SPDs where necessary and include the latest standards and good practice including on climate change adaptation and mitigation measures ¹⁹ .	
Action C4: DPDs and SPDs requirements in development proposals Incorporate the requirements of local authority DPDs and SPDs relevant to climate change adaptation and mitigation and sustainable construction in all development proposals.	Developers and their advisers (e.g. architects, surveyors and engineers)
Action C5: Sustainability Appraisals and Strategic Environmental Assessments Incorporate consideration of climate change into Sustainability Appraisals (SAs) of Local Development Documents (LDDs) and Strategic Environmental Assessments (SEAs) of other plans and programmes prepared within the South East region and develop further practical guidance / examples of good practice (for example how to predict the future baseline and estimate the likely greenhouse gas emissions from implementing a LDD). Use the practitioners' guidance on SEA and climate change to guide SAs and SEAs in the region ²⁰ .	Local planning authorities / Transport authorities and all those that may need to undertake SEA (e.g. local authorities, water companies, Environment Agency) ODPM
Action C6: Development checklists Use the existing development checklists for climate change (e.g. the checklist developed by the Three Regions Climate Change Group ²¹ and WWF ²²) to ensure new development adapts to climate change. Develop checklists tailored to local circumstances where appropriate.	Developers and their advisers (e.g. architects, surveyors and engineers) Local planning authorities
Action C7: Climate proofing plans and strategies Plans and strategies produced within the region across all sectors and scales should be consistent with the climate change policy (CC2) in the South East Plan. Climate proofing may provide a useful tool to ensure that changing climate is taken account of at the outset.	All those producing plans and strategies relevant to the region which could affect and / or be affected by a changing climate ²³
Action C8: Code for Sustainable Homes Adopt the voluntary Code for Sustainable Homes (once finalised) as minimum practice for all new homes in the South East ²⁴ . Incorporate relevant elements of the voluntary Code for Sustainable Homes as minimum practice within DPD policies and SPDs for all homes in the South East (once finalised). Lobby government to tighten the standards included in the consultation paper on the Code.	Developers and their advisers (e.g. architects, surveyors and engineers) Local planning authorities The Regional Assembly, SEEDA, SECCP and Local Authorities
Action C9: Nottingham Declaration on Climate Change All local authorities in the South East sign the Nottingham Declaration on Climate Change and work with local stakeholders to address the causes and effects of climate change ²⁵ .	Local authorities
Action C10: Lobbying central Government on climate change Lobby central Government on climate change adaptation and mitigation as many of the main contributors to climate change are under central government control e.g. aviation policy, investment in public transport, road building, taxation, etc. Specific examples include: <ul style="list-style-type: none">• Strengthening building regulations• Introducing fiscal incentives/ breaks for sustainable design	Representatives from the South East, including: The Regional Assembly, SEEDA, SECCP and Local Authorities

²⁰ Levett-Therivel Sustainability Consultants, UKCIP, Environment Agency, Environmental Change Institute, CAG Consultants, Countryside Council for Wales and English Nature (2004). Strategic environmental assessment and climate change: guidance for practitioners. www.ukcip.org.uk > resources > publications

²¹ *Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate*, Three Regions Climate Change Group comprising Sustainable Development Roundtable for the East of England, London Climate Change Partnership and the South East Climate Change Partnership. Greater London Authority. 2005. www.london.gov.uk > mayor of london > sustainability > london climate change

²² House builders Toolkit www.wwf.org.uk > one million sustainable homes

²³ Those producing plans and strategies relevant to the region could include: central government; Environment Agency; the Regional Assembly; SEEDA; Local authorities; Primary Care Trusts; utility and telecommunication companies; transport service providers and authorities; waste management and disposal industry; and tourism and leisure industry

²⁴ ODPM has published a consultation paper on the proposals for introducing a Code for Sustainable Homes www.odpm.gov.uk > building regulations > consultation papers

²⁵ www.lga.gov.uk > our work > sustainable energy & climate change > action for local authorities

Priorities for actions	Key players
<p>Action C11: Raising awareness with local communities</p> <p>Proactively raise awareness and provide advice and information to local communities on climate change, including on energy and water efficiency and conservation, renewable energy generation, waste recycling and distance and mode of travel.</p>	<p>SECCP, Local authorities, water companies, energy providers</p>
<p>Action C12: Climate change research</p> <p>Increase the knowledge and understanding of climate change by implementing the recommendations in the SECTORS report on filling gaps in climate change research²⁶.</p> <p>(These cover three principle fields: the science base of climate change; impacts; and responses. Specific recommendations for SECCP in relation to climate change research cover: the Research Forum; integration with sector groups; integration with other regional and local bodies; create and maintain a research section on the SECCP website; and adopt and maintain the research database).</p>	<p>Members of SECCP, researchers, universities, Defra, Environment Agency, English Nature, water companies</p>
<p>Action C13: Climate change indicators</p> <p>Develop further the existing SECTORS climate change indicators for the South East and seek commitment from relevant organisations to collate the data for indicators relevant to them.</p> <p>(The summary of the SECTORS report provides details of the progress made in developing a regional set of climate change indicators (see Section 5 and Appendix 3)).</p>	<p>The Regional Assembly and SECCP</p>
<p>Action C14: Inventory of greenhouse gas emissions</p> <p>Develop an inventory of greenhouse gas emissions in order to monitor progress towards achieving the targets within Policy CC2.</p>	<p>The Regional Assembly, Defra and SECCP</p>

²⁶ The 2004 SECTORS (South East Climate Change Threats and Opportunities Study) report summary document, *Meeting the challenge of climate change* and Arkell, B., Darch, G., Wilson, E. and Piper, J. 2004. *South East Climate Threats and Opportunities Research Study (SECTORS)*. Technical Report for the South East England Development Agency, Guildford.

Mitigation: (i) Improving energy efficiency performance of new and existing buildings and influencing behaviour of occupants

What is the issue?

Household energy use accounts for more than a quarter of all energy used in the UK, but a typical household wastes around a third of that energy each year. The energy efficiency of buildings is largely determined by its design, the choice of materials and the choice of plant and equipment.

In order to reduce greenhouse gas emissions, the energy efficiency of new and existing buildings need to be improved. New development, while only representing a small proportion of overall stock, provides an opportunity to integrate higher standards of energy efficiency at the design stage with the benefits extending throughout the life of the buildings. Increasing energy efficiency not only means that a greater proportion of energy demand will be met by renewables, but also will result in a potential reduction in the proportion of household income spent on energy therefore reducing 'fuel poverty'.

Because new homes only represent a very small proportion compared with the existing housing stock, existing homes represent the greatest opportunity for efficiency improvements. However, whilst significant energy savings could be made uptake has generally been poor because of low public interest (see barriers below). This equally applies to other buildings, commercial, public etc.

How is the issue being addressed?

Research and information

Considerable energy efficiency research and information exists. Examples include the Energy Saving Trust (EST), DTI Market Transformation Programme, EU energy labelling schemes, the National Energy Foundation, CREATE initiative, the Carbon Trust, GOSE Regional Energy Group.

Information is available to households and businesses on actions to take to improve energy efficiency and good practice is being promoted through case studies. Sources include Thames Valley Energy Agency, or TV Energy for short²⁷.

Awareness raising and building partnerships

The Regional Energy Group, a sub-group of the South East Sustainable Development Round Table, seeks to promote effective information sharing and liaison, actively encourage energy efficiency as a route to sustainable economic development and encourage the exploitation of innovative technology opportunities and skills

There are energy efficiency advice centres in the Solent²⁸ (serving Hampshire, Isle of Wight and West Sussex) and Milton Keynes²⁹.

The Energy Efficiency Accreditation Scheme (EEAS) is the UK's only independent award recognising achievements in reducing energy use by organisations in industry, commerce and the public sector. The Carbon Trust has overall responsibility for the scheme, with accreditation awarded by the Energy

²⁷ www.tvenergy.org

²⁸ www.environmentcentre.com

²⁹ www.natenergy.org.uk/mkea

Institute. The scheme is managed by the National Energy Foundation. To date, over two hundred organisations have gained accreditation³⁰.

Developing policy and strategy

Policy EN1 of the South East Plan will help to implement CC2 part i. It encourages high standards of energy efficiency in all development, supports efficiency ratings such as BREEAM and National Home Energy Rating (NHER) and promotes energy efficiency opportunities through the scale of new regional development.

SEEDA have developed a sustainability checklist³¹ which includes energy use in buildings through their structure and use.

Through the Energy Efficiency Commitment (EEC) energy suppliers have targets for promoting improvements in domestic energy efficiency. EEC2 runs from 2005-2011. The Home Energy Conservation Act (1995) established local authority HECA officers to work towards the 30% efficiency improvement target by 2010. The Building Regulations and the new (emerging) Code for Sustainable Homes also represent a mechanism for promoting energy efficiency in building design and construction.

In terms of behaviour, initiatives such as the EST, EU energy labelling and the DTI Market Transformation Programme exist to promote efficient appliances / technologies and their wise use. Also, grants and loans are available through government schemes operated by the EST³² and Carbon Trust³³ to promote efficiency improvements, and tax incentives are available for improving domestic energy efficiency through, for example, the installation of efficient boilers.

What barriers need to be overcome?

The key barriers to improving energy efficiency performance of new and existing buildings and influencing behaviour of occupants include:

- For many, energy costs are not perceived as significant³⁴. Although in the last year these have risen, over the last decade they have fallen by 17% for domestic (fuel and light) and 8% for industry (all fuel) in real terms³⁵. Research shows energy efficiency does not necessarily equate to reduced consumption, additional strategies that reduce energy demand are also required.

Example 3:

'Seeing the light: the impact of micro-generation on the way we use energy'

The first ever research into the effect of microgeneration on attitudes and behaviours in homes and schools, published on Monday 24 October 2005 by the Sustainable Consumption Roundtable (a joint initiative of the National Consumer Council and the Sustainable Development Commission) reveals the remarkable impact of microgeneration on people's everyday energy use, and calls for decisive government action.

Seeing the Light proves that DIY energy generation – from mini wind turbines, solar panels and air source heat pumps – has the power to engage homes and schools to actively cut their energy use and connect with climate change solutions. According to the report, households without these technologies failed to understand how they used energy (100% claimed that switching suppliers was the only way to reduce energy bills), and did not link their concerns about climate change with their own behaviour. Whereas households with the technologies were able not only to understand, but control their energy consumption, resulting in lower bills and a zeal for saving energy throughout the home.

Set against the government target of reducing carbon dioxide by 60% over the next 50 years, Seeing the Light illuminates the vital role that microgeneration has to play in the UK's future energy mix.

See Sustainable Development Commission website at: www.sd-commission.org.uk > publications > energy

³⁰ www.thecarbontrust.co.uk > further help > EE accreditation scheme

³¹ www.sustainability-checklist.co.uk

³² www.est.org.uk > myhome > grants and offers

³³ www.thecarbontrust.co.uk

³⁴ Parliamentary Office of Science and Technology, Postnote, number 249, October 2005

³⁵ DTI Energy – Its Impact on the Environment and Society, 2005

- Perceptions and lack of information mean that even energy efficient dwellings are not always used to optimise efficiency. For example people now expect warmer homes. For industry, energy efficiency investments are often not seen as a priority³⁶.
- Influencing behaviour requires coherent and strong leadership and national, as well as regional level.
- The need to improve efficiency of existing stock of dwellings, (as new build represents <1% of the housing stock each year).
- Building Regulations perceived to be too weak (even as a minimum standard) with a lack of enforcement to ensure compliance or incentives to exceed them. Poor workmanship and installation leading to homes not meeting the Building Regulations³⁷.
- Developers and builders are primarily concerned with capital expenditure and not operational costs, potential savings and emissions.

What are the priorities for action and who are the key players?

Table 3: Priority actions for energy efficiency

Priorities for actions	Key players
<p>Action M(i) 1: Energy efficiency targets in DPDs</p> <p>Include energy efficiency requirements for new development in DPD policies, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance or Developers, architects informatives) (see draft South East Plan Policies EN1)³⁸.</p> <p>Incorporate building and energy standards (see action M(i) 2) into DPDs and SPDs. The planning system can influence energy efficiency mainly through encouraging layout and design to make use of natural light and heat. SPDs, Area Action Plans (AAPs), master plans and design briefs should be used to increase the influence over design of new developments and their incorporation of energy efficiency and renewable energy technologies.</p> <p>Note that these standards should be treated as minimum targets and Local Planning Authorities and developers should aspire to exceed them wherever possible.</p>	<p>Local planning authorities</p> <p>Developers and their advisers (e.g. architects, surveyors and engineers)</p>
<p>Action M(i) 2: Building and energy standards (BREEAM, Eco Homes, SAP and NHER)</p> <p>Achieve a BREEAM rating of at least 'very good' and ideally 'excellent' as standard practice for all non-residential development in the South East.</p> <p>Achieve an Eco Homes rating of at least 'good' for all residential refurbishments and at least 'very good' for all new build in the South East.</p> <p>Achieve energy reduction measures through site design and building design. Measures should include the use of passive solar gain in the design and location of buildings, sufficient to meet Eco Homes' best practice standards for insulation. In addition, the use of efficient appliances and appliances with low CO₂ emissions should be incorporated.</p> <p>Achieve a good energy efficiency rating under SAP and National Home Energy Rating (NHER) and use best practice guidance (e.g. aspire to a NHER rating of 10 with a minimum of 7).</p> <p>(note that BREEAM and Eco Homes are not just relevant to energy efficiency, but are also relevant to other principles including those on renewable energy (<i>Mitigation iv</i>) and water efficiency (<i>Adaptation iii</i>))</p>	<p>Developers and their advisers (e.g. architects, surveyors and engineers)</p>
<p>Action M(i) 3: Strengthening and enforcing Building Regulations</p> <p>Strengthen and extend the minimum standards for energy efficiency set out in the Building Regulations (Part L), including the revisions that come into force in April 2006. Improvements could include, for example, the requirement for energy-efficiency</p>	<p>ODPM, Defra</p>

³⁶ Delivering Energy Efficiency Savings, Defra 2003

³⁷ As shown by study funded by the Energy Efficiency Partnership for Homes and undertaken by the National Energy Services and Building Research Establishment.

³⁸ Policy EN1 (i) requires development to attain a high energy efficiency rating (using BREEAM and NHER for example).

Priorities for actions	Key players
improvements to be made to the main building when a house is being extended. Improve enforcement of Building Regulations and introduce better quality control systems by developers and buildings to ensure and prove compliance (studies show a significant proportion of properties have faults which would result in failure to meet Building Regulations).	Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers), builders, construction trade associations
Action M(i) 4: Designing buildings to increase their thermal mass Design in more shading and natural ventilation and increase the thermal mass of a building to reduce demand for air conditioning. Include requirements in DPD policies, SPDs (area and topic based) and planning conditions and obligations, as well as through planning advice and encouragement (e.g. guidance or informatives) or by other control mechanisms (e.g. Building Regulations), as appropriate.	Developers and their advisers (e.g. architects, surveyors and engineers) Local planning authorities, ODPM
Action M(i) 5: Refurbishing publicly owned buildings Lead by example when refurbishing existing building stock and institutions, including local authority buildings, public housing, hospitals, schools, universities etc, and achieve good standards of energy efficiency.	Education authorities, hospital trusts, local authorities, universities
Action M(i) 6: Lobby government for more incentives to promote energy efficiency Lobby central government for more effective incentives (tax, grants etc.) for developers to build more efficiently and home owners / businesses to modify energy use behaviour.	The Regional Assembly, SEEDA, National Energy Foundation
Action M(i) 7: Using Business Rates as an incentive for energy efficiency Introduce differential business rates to reflect energy performance of buildings and owners / tenants future energy bills.	ODPM, Local Authorities
Action M(i) 8: Support for businesses on energy efficiency through Envirowise Improve and build on the support available to businesses through Envirowise to include assistance and encouragement to local businesses to install energy efficiency measures ³⁹ .	Envirowise, SEEDA, GOSE
Action M(i) 9: Joint working between regional organisations Undertake joint working between regional organisations (e.g. The Regional Assembly, GOSE, SEEDA) to ensure policies are complimentary and resources used efficiently and investigate access to European funding networks.	The Regional Assembly, GOSE, SEEDA
Action M(i) 10: Information on energy efficiency Provide planning advice and promote information to encourage energy efficiency in existing buildings (e.g. homes, schools, hospitals, offices and other public and commercial buildings), including technology and appliances.	Energy Saving Trust, Carbon Trust, Local Authorities, SEEDA, TV Energy
Action M(i) 11: Information on how to be energy (and water) efficient Include information in new homes on how to be energy (and water – see <i>Adaptation principle iii</i>) efficient, highlighting easy quick win methods. This could be included with the new Home Information Packs to be introduced in early 2007. Direct householders (owner occupiers and tenants) to sources of advice on energy efficiency.	ODPM, Envirowise, The Regional Assembly, SECCP, developers Local Authorities, Registered Social Landlords
Action M(i) 12: Energy efficiency in existing buildings Encourage energy efficiency in existing buildings, including through planning advice and encouragement (e.g. guidance or informatives) or by other control mechanisms (e.g. Building Regulations) and grants.	Local planning authorities, Energy Saving Trust, Carbon Trust, Local Authorities, SEEDA, TV Energy, developers and their advisers (e.g. architects, surveyors and engineers), property owners

³⁹ www.envirowise.gov.uk

Mitigation: (ii) Reducing the need to travel and ensuring good accessibility to public and other sustainable modes of transport

What is the issue?

Transport is a major contributor to greenhouse gas emissions, accounting for more than 25% of all CO₂ emissions in the UK. Emissions have almost doubled over the last 20 years, and transport is the only sector where emissions have not reduced⁴⁰. Households in the South East generated the highest level of transport emissions in the UK in 2001⁴¹. Road transport within the region generated the highest emissions of any UK region in 2003⁴², and over a third more than the next highest region, the North West. Air travel is increasing rapidly and is an important contributor to emissions⁴³.

Reducing the need to travel and ensuring good access to public transport and other more sustainable modes such as walking and cycling for necessary trips should begin to reduce greenhouse gas emissions. Although average journey length by car is decreasing, average trip lengths are remaining relatively stable (draft South East Plan para. 1.4, p.90). There remains a need to manage mobility (i.e. reduce the need to travel) and to rebalance the split between car and other modes.

An efficient transport system is essential to maintain and foster the region's economy, and is a factor in economic performance. The South East has a particularly strong relationship with London (particularly West Kent and the Thames Gateway), but journey to work patterns are becoming more complex and multi-directional (e.g. the Western Corridor) (draft South East Plan para. 1.16, p.51). Some less prosperous parts of the region suffer from a lack of connectivity (e.g. East Kent), while stronger performing areas suffer from road and rail congestion (e.g. Western Corridor).

How is the issue being addressed?

Some of the key existing activities and actions to reduce the need to travel and ensure good accessibility to public and other sustainable modes of transport are summarised below.

Research and information

Research commissioned by the Regional Assembly on commuting patterns and inter-regional links between the South East, London and the East of England regions, and comparisons with North West European city regions (draft South East Plan p.51):

- Cambridge Econometrics, WSP and LSE (2005) 'Commuter flows in London and the Wider South East 2001-20016/12'.
- Sir Peter Hall (2005) 'Trends and messages from POLYNET' (A study of evolving business patterns across the wider South East including a comparison with North West European city regions).
- Centre for Economics and Business Research (2005) 'Symbiosis or sibling rivalry? The future links between London and the South East'.

⁴⁰ The Planning Response to Climate Change: Advice on Better Practice, ODPM. p.61.

⁴¹ The impact of UK households on the environment, Economic Trends 611 October 2004, Office for National Statistics.

⁴² Experimental Statistics on carbon dioxide emissions at Local Authority and Regional Level Defra Statistics Summary 21 October 2005 – Detailed Sector Split spreadsheet.

⁴³ Aviation is not included within national or international targets.

Awareness raising and building partnerships

Authorities in South Hampshire have pioneered an integrated approach to transport management through The Solent Transport Partnership. A similar approach is advocated in the Thames Gateway and Thames Valley to deliver transport oriented patterns of development (para. 9.102-3, Regional Transport Strategy (RTS), Chapter 9 of RPG9, July 2004.), and will be taken forward in the Implementation Plan for the draft South East Plan.

Developing policy and strategy

The draft South East Plan is addressing the need to reduce the contribution of transport to climate change through its overall spatial strategy and through the Regional Transport Strategy policies:

- *CC8 Urban Focus and Urban Renaissance* – sets the spatial strategy to focus development within existing urban areas to foster accessibility to employment, housing, retail and other services and avoid unnecessary travel. This provides the emphasis on the positive feedback loop between sustainable places with quality services and a reduced need to travel. The South East Plan identifies the region's policy to concentrate development in urban areas as one factor which is influencing the slight reduction in average journey length by car (para. 1.4, p. 90).
- *CC3 Resource Use* – promotes measures to stabilise the South East's ecological footprint by 2016, including increased energy efficiency in new development, adaptation of existing development to reduce resource use, complementary fiscal measures and behavioural change.
- *CC5 Infrastructure and Implementation* – emphasises the need to improve timely infrastructure delivery through partnership working, investment programmes to help deliver the South East Plan proposals, clear guidance on development contributions, and other measures, in line with a proposed Concordat between Government and the Assembly.
- *T1-T14 Communications and Transport Policies* (Regional Transport Strategy) – the RTS seeks to support sustainable patterns of development, manage mobility and increase accessibility to quality public transport services, to achieve a continued modal shift away from car travel, and reduce the impact of the transport system on the environment. The RTS highlights the need for investment decisions on transport infrastructure to be more closely integrated with economic, environmental and social objectives in order to achieve the overall objectives.
- *Housing Policy H3 The Location of Housing* – this focuses development within urban areas, directing at least 60% new housing to previously developed land / buildings.

Example 4: Buckinghamshire travel plans

Buckinghamshire County Council first established a workplace travel initiative in 1998 called 'Travel Choice.' One of the notable successes of the scheme has been the county's travel plan for its own staff, which has cut single-occupancy car commuting from 72 per cent to 50 per cent over five years. The council is working with another 32 companies and organizations based in the county, and altogether its travel plan work covers 21,700 employees, or 11 per cent of the workforce.

When the council first started working on travel plans, in 1999-00, the budget was only £15,000. As the scheme has expanded the expenditure on Travel Choice has grown, and in 2002-03 spending on workplace travel plans was £91,000.

Buckinghamshire County Council began work on school travel in 1999. Initially the main emphasis was on physical measures such as traffic calming, but recently the emphasis has shifted to non-infrastructure measures. The council has developed a clear framework for school travel plan work and is currently working with 142 schools in the county (out of a total of 221), covering 63 per cent of all school pupils. For the schools participating in travel plans, car journeys fell from 45 per cent to 37 per cent between 2002 and 2003. The schools with the most impressive travel plans have achieved between 21 per cent and 39 per cent reduction in car use. In 2002-03, total council spending was £111,000 which included both safe routes to school measures (such as speed humps and 20 mile per hour zones) and school travel plans.

Source: Case study reported in: Foley J, Sansom N, and Grayling T. (2005) *Keeping the South East Moving*. Working Paper Three. IPPR 2005. Primary sources: Buckinghamshire County Council (2003) *Annual Progress Report 2002/03*. Buckinghamshire County Council (2002) *Annual Progress Report 2001/02*. Cairns S, Sloman L, Newson C, Anable J, Kirkbride A and Goodwin P (2004) *Smarter Choices – Changing the Way We Travel. Volume 2. Case Studies* published by the Department for Transport by Robert Gordon University in Aberdeen, Eco-Logica, Transport for Quality of Life and the ESRC Transport Studies Unit at University College London.

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- Economy Policy *RE5 Information Communications Technology (ICT) and changing working practices* – supports flexible and home based businesses and accessible e-services and e-education.

The Implementation Plan for the draft South East Plan identifies mechanisms, lead roles and supporting roles to implement the RTS and other topic based policies. It does not address cross-cutting policies.

'Keeping the South East Moving'⁴⁴ prepared by the Institute of Public Policy Research (IPPR) in 2005 for the Commission on Sustainable Development in the South East discusses options for funding public transport improvements in the South East. It examines three ways in which policy makers in the South East can encourage sustainable mobility: road user charging; softer measures for encouraging public transport use, cycling and walking; and sustainable community design. The paper recommends options for better coordinating transport policy and delivery within the South East region and across the greater South East.

Other relevant plans and policies include a strategy for improved public transport access to Gatwick airport through (Local Transport Plans) LTPs being investigated by the Strategic Rail Authority and the Airport Surface Access Strategy.

Reducing the need to travel and policies and proposals that foster an improved network of public transport services are being developed by local authorities in the South East in LDDs and LTPs.

What barriers need to be overcome?

The key barriers to reduce the need to travel and ensure good accessibility to public and other sustainable modes of transport include:

- Low quality, or poorly located, service provision encourages travel elsewhere to access, for example, better schools, health services, shops etc.
- Reluctance to require that public transport infrastructure and services are available from first occupation of homes / businesses to ensure sustainable habits are formed from the start through planning policies and conditions or obligation agreements.
- Lack of local authority control / negotiating power over public transport contracts (e.g. buses).
- Capacity / gauge of regional rail links (e.g. Southampton to Midlands), to allow more use of rail by container transport (subject of bid by Southampton City Council under Transport Innovation Fund).
- Lack of planning system control over human behaviour regarding mobility and choices made over the location of home and work and mode of transport.

What are the priorities for action and who are the key players?

Table 4: Priority actions for reducing the need to travel and accessibility to transport

Priorities for actions	Key players
<p>Action M(ii) 1: Sustainable transport in DPDs and SPDs</p> <p>Include measures to manage mobility, reduce the need to travel and promote sustainable modes of transport in drafting new and reviewing existing policies and proposals in DPDs, SPDs and Local Transport Plans (LTPs).</p>	Local planning authorities, Local transport authorities
<p>Action M(ii) 2: Phasing of public transport infrastructure</p>	Local planning authorities, Local

⁴⁴ www.ippr.org.uk > publications and reports

Priorities for actions	Key players
<p>Ensure public transport infrastructure is delivered alongside new housing / employment to encourage sustainable travel habits from occupation. Include requirements in relevant LDDs policies and SPDs.</p> <p>Use planning conditions to require on-site transport measures and facilities as part of development and planning obligations to achieve improvements to public transport, walking and cycling, where such measures would be likely to influence travel patterns to the site involved, either on their own or as part of a package of measures.</p>	<p>transport authorities, public transport operators</p> <p>Developers and their advisers</p>
<p>Action M(ii) 3: Changing the way we travel</p> <p>Put in place 'smarter choices programmes' at the local level, combining 'soft' measures (e.g. targeted work based and personal travel planning, public transport partnerships, school travel plans, broader travel awareness campaigns and car clubs) with 'hard' traffic restraint measures (e.g. re-allocating road space to public transport and pedestrians, re-phasing traffic lights, replacing pedestrian subways with surface crossings, congestion charging and road user charging) in line with the Government's Guidance 'Making Smarter Choices Work' 2005.</p>	<p>Local planning authorities, Local transport authorities, Local authorities, GOSE</p>
<p>Action M(ii) 4: Road charging</p> <p>Make appropriate use of the powers available under the Transport Act 2000 to introduce new charging initiatives where these are required in order to support delivery of the regional spatial and transport policy frameworks (see draft South East Plan Policy T7).</p> <p>Other potential actions include:</p> <ul style="list-style-type: none"> • Authorities and agencies in the South East should encourage the Government to press ahead with plans to introduce a national congestion charging scheme within the next 10-15 years. • The Government should pledge that the revenue raised from charging motorists within a region is redistributed back to benefit that region. Any money raised from motorists travelling in the South East should therefore be earmarked for transport improvements that benefit the people of the South East. • Authorities and agencies across the greater South East should work in partnership to explore options for introducing motorway tolling on congested commuter routes as well as tolling on major motorway sections that are due to be widened. Motorway tolling schemes could be introduced as public-private partnerships whereby the financial risks, administration and revenue are shared between the Government and the private sector. • Alongside road user charging schemes there could be exemptions or reduced charges for High Occupancy Vehicles carrying two or more people and low carbon vehicles that produce lower greenhouse gas emissions. 	<p>Local highway authorities</p> <p>Local highway authorities, DoT, GOSE, SEEDA, The Regional Assembly</p>
<p>Action M(ii) 5: Preparation of travel plans</p> <p>Prepare travel plans for all travel generating developments. Use planning conditions to ensure they are prepared.</p> <p>Identify categories of travel generating developments, both existing and proposed, in DPDs and SPDs and Local Transport Plans (LTPs) for which travel plans should be developed.</p> <p>Prepare travel plans for major companies and public sector organisations in the South East and promote workplace travel planning.</p>	<p>Developers</p> <p>Local planning authorities</p> <p>Businesses, Local authorities</p>
<p>Action M(ii) 6: Targets for travel plans</p> <p>Set targets for preparing travel plans at a regional and local level.</p> <p>(e.g. ensure that every school in the South East has a travel plan by 2010 for helping to reduce car trips especially during the morning school run and aim for 50 per cent of the working population in urban areas of the South East to be covered by work travel plans by 2010 for helping to reduce car trips during the peak commuter times).</p>	<p>The Regional Assembly, Local planning authorities</p>
<p>Action M(ii) 7: Promoting flexible working practices</p> <p>Facilitate different ways of working to reduce the need to travel, e.g. home/teleworking and teleconferencing. This could be supported by, for example:</p> <ul style="list-style-type: none"> • the inclusion of appropriate policies in LDDs (e.g. promoting appropriate work-live development) and support / information from employers for staff working from home or at a local telecentre; • promoting the use of teleconferencing and videoconferencing by businesses and public sector organisations (e.g. provide advice, advertise facilities, foster culture, 	<p>Local planning authorities, Local authorities, businesses, organisations representing commercial and business interests</p>

Priorities for actions	Key players
<p>training, grants etc); and</p> <ul style="list-style-type: none"> employers taking a more supportive and flexible approach to home working. 	
<p>Action M(ii) 8: Low emission fleet and freight vehicles</p> <p>Fleet managers to clean up existing petrol and diesel vehicles and buy new cleaner vehicles.</p> <p>Seek advice from the Energy Saving Trust⁴⁵, via their Transport Energy Best Practice programme, which offers managers of car and van fleets as well as freight operators information on how to cut costs and emissions.</p>	Fleet managers, Energy Saving Trust
<p>Action M(ii) 9: Financial incentives for low emission vehicles</p> <p>Government to introduce greater financial incentives for low emission vehicles. Options could include:</p> <ul style="list-style-type: none"> higher Vehicle Excise Duty rates for less efficient cars / reduction for the most fuel-efficient cars and a company car tax regime which favours fuel-efficient cars more; increased support for renewable alternatives to conventional petrol and diesel, grown from crops such as oil seed rape and sugar beet; and increased grants for the purchase of low emissions vehicles such as hybrids, which run on a mixture of petrol and electricity. 	Defra, HM Treasury, DoT
<p>Action M(ii) 10: Lobby central government on transport</p> <p>Lobby central government:</p> <ul style="list-style-type: none"> For sufficient and prioritised funding for public transport infrastructure. For local authority regulatory powers over bus routes to improve negotiating power with transport providers. To prioritise improvements to the rail network (passenger and freight) above airport expansion. To deliver improvements to the rail network to facilitate transfer of freight to rail e.g. containers using inter-regional routes. 	The Regional Assembly, Local transport authorities
<p>Action M(ii) 11: Monitoring success of urban concentration policies</p> <p>Monitor the success of urban concentration policies in terms of impact on travel behaviour and use to inform new and revisions to LDDs and LTPs.</p>	Local planning and transport authorities
<p>Action M(ii) 12: Monitoring access to quality services and travel demand</p> <p>Monitor access to quality services and resulting travel demand.</p>	Local strategic partnerships

⁴⁵ www.est.org.uk

Mitigation: (iii) Promoting land use that acts as carbon sinks

What is the issue?

Atmospheric carbon in the form of carbon dioxide is captured and stored in living (trees and other green vegetation) or non-living reservoirs (soil, geological formations, oceans, wood products)^{46 47}. Land uses which absorb and store carbon over long periods of time ('carbon sinks') may help to offset carbon dioxide emissions, at least in the short to medium term.

Trees are made up of 50% carbon, and absorb carbon as they grow. In the short term some carbon is released as part of respiration and when leaves fall and decompose. Only the carbon that is stored in woody biomass (e.g. trunks, roots, stems etc) is locked away for longer periods⁴⁸. This will be released once the tree dies and decomposes. Actively managed, faster growing woodland absorbs and stores more carbon than unmanaged, derelict woodland⁴⁹, but once mature, woodland is effectively carbon-neutral as growth is balanced by decay⁵⁰.

'To place the potential role of woodland in the UK in context, the total carbon stock associated with above ground woody biomass (~130 MtC) is less than the total of fossil fuel emissions in a single year. However, the net uptake of carbon in UK woodland (~2.5 tC yr-1) is significant in comparison with national emissions reductions commitments made under the Kyoto Protocol (20 MtC yr-1). Therefore, although small in absolute terms, woodland can play a significant role in emissions reductions in the short term, and 'buy time' to allow new, low carbon technologies to be implemented.' (Forest Research⁵¹)

Improving land management practices to reduce erosion reduces the release of carbon dioxide from soils. Measures include retaining plant cover over winter, practising no-till farming, converting marginal crop land to perennial grass or trees, maintaining and managing hedgerows, and restoring wetlands^{52 53}. These practices have energy efficiency and financial benefits due to the reduced need for machinery use, and also benefit biodiversity.

How is the issue being addressed?

Some of the key existing activities and actions to promote land uses that act as carbon sinks are summarised below.

Research, awareness raising and building partnerships

Relevant research and awareness raising initiatives are being undertaken by a range of organisations including: the Forest Commission / Forest Research; Defra; UKCIP; Carbon Trust; Woodland and Wildlife Trusts; Country Landowners Association (CLA); National Farmers Union (NFU).

Developing policy and strategy

⁴⁶ This process is known as carbon sequestration.

⁴⁷ Seeing the wood for the trees: A forestry and woodlands framework for South East England, 2004.

[www.forestry.gov.uk/pdf/stwfft_framework.pdf/\\$FILE/stwfft_framework.pdf](http://www.forestry.gov.uk/pdf/stwfft_framework.pdf/$FILE/stwfft_framework.pdf)

⁴⁸ Forest Research, the research agency of the Forestry Commission – Climate change mitigation: www.forestresearch.gov.uk > research themes > woodlands & the environment > climate change

⁴⁹ Royal Forestry Society www.rfs.org.uk

⁵⁰ www.woodland-trust.org.uk > campaigns

⁵¹ Forest Research, the research agency of the Forestry Commission – Climate change mitigation: www.forestresearch.gov.uk > research themes > woodlands & the environment > climate change

⁵² Climate change and the rural economy, Country Land Association, 2001. www.cla.org.uk

⁵³ See www.agr.gc.ca/policy/environment/air_03_02_e.phtml for more details

The draft South East Plan potentially promotes carbon sinks indirectly through several policies, including:

- *NRM5: Woodlands* - calls on local authorities and other bodies to support the implementation of the Regional Forestry and Woodlands Framework, protecting and enhancing the region's woodlands.
- *CC4: Sustainable Construction* - includes an expectation that new development will be designed to include the procurement of low-impact materials.

Other relevant plans and strategies include the Regional Forestry and Woodlands Framework⁵⁴ and CLA's Climate Change and the Rural Economy⁵⁵.

Agricultural and forestry support schemes also have the potential to promote carbon sinks:

- The England Rural Development Programme encourages energy crops and promotes agri-environment schemes which promote more sustainable land management.
- Reforms to the Common Agriculture Policy which decoupled farm payments from incentives for production and require environmental standards to be met.
- The Farm Woodland Scheme, part of the ERDP, encourages tree planting on land currently in productive agriculture.

**Example 5:
Using riverbank stabilisation to reduce erosion and increase carbon sequestration**

Riverbank stabilisation using coppiced hazel, for example, can be used to reduce erosion and increase carbon sequestration.

A good practice example is the Environment Agency's £15 million riverbank stabilisation scheme project at Rye, Kent. Giant bundles of coppiced hazel are used to trap sediments which will eventually build up to form stable riverbanks. The use of this innovative 'soft engineering' solution not only provides a more attractive alternative to steel piles for shoring up crumbling riverbanks, but the more natural edge to the river allows riverside plants and wildlife to establish. In addition, using coppice in this way provides a market for a local woodland product, helping to sustain traditional woodland management.

Source: *Seeing the wood for the trees: A forestry and woodlands framework for South East England*, Forestry Commission, 2004, p.20.

What barriers need to be overcome?

The key barriers to promote carbon sinks include:

- Uncertainty remains over the effectiveness of carbon sinks as a means of reducing carbon dioxide emissions. However, better management of woodland and soil resources has multiple benefits which should be supported (e.g. biodiversity, reduced erosion, energy efficiency, amenity).
- The use of steel, blockwork and other less sustainable materials for construction etc., when wood would be appropriate.
- The need for a financial incentive to promote land management for carbon capture.
- The inability of the planning system to deliver major habitat creation and inadequate funding to encourage sympathetic management of land.

What are the priorities for action and who are the key players?

Table 5: Priority actions for promoting carbon sinks

Priorities for actions	Key players
<p>Action M(iii) 1: Supporting the creation of woodland in DPDs</p> <p>Include policies in DPDs to support the extension to existing woodlands and/or the creation of new woodland as part of major development proposals.</p>	<p>Local planning authorities, developers and their advisers (e.g. architects)</p>

⁵⁴ Seeing the wood for the trees: A forestry and woodlands framework for South East England, Forestry Commission, 2004

⁵⁵ Country Land and Business Association – Climate Change and the Rural Economy, CLA 2001

Priorities for actions	Key players
<p>Action M(iii) 2: Creation of new woodland as part of developments</p> <p>Developers take opportunities to improve the local environment and contribute to sustainable development through creating new woodlands.</p> <p>Increased tree coverage can raise the quality and profile of development by enhancing its visual appearance, as well as playing an important role in enhancing biodiversity, the removal of pollutants, thereby increasing air quality and health, and the creation of carbon sinks to offset carbon emissions and reduce the impact of development on global climate change.</p>	<p>Developers and their advisers (e.g. architects)</p>
<p>Action M(iii) 3: Integrating green space within communities</p> <p>Within LDDs, as well as other strategies and plans, promote the concept of multifunctional green spaces and inter-connecting links which are designed, developed and managed to meet the environmental, social and economic needs of communities.</p> <p>Integrating green space / grids when planning existing and new communities will contribute to a high quality natural and built environment and enhance the quality of life and "liveability" for residents and visitors as well as have benefits as carbon sinks.</p>	<p>Local planning authorities, SEEDA, The Regional Assembly, Countryside Agency, English Nature, SERLAWN</p>
<p>Action M(iii) 4: Management of woodland to maximise carbon capture</p> <p>Protect and enhance existing woodland, ensuring it is actively managed for maximum carbon capture.</p>	<p>Forestry Commission / Woodland Trusts, woodland owners, SERLAWN</p>
<p>Action M(iii) 5: Community woodlands</p> <p>Promote the creation of community woodlands which act as long-term carbon sinks, as well as providing an amenity resource and wider environmental benefits. Provide support, information and financial assistance to local communities that are interested in creating their own community woodland.</p> <p>Include policies in DPDs to support the creation of community woodlands.</p>	<p>Local planning authorities, Forestry Commission, Woodland Trusts, Countryside Agency, woodland owners, SERLAWN</p>
<p>Action M(iii) 6: Land and forestry management for carbon capture</p> <p>Encourage land and forestry management measures which reduce the release of carbon from soils, and increase carbon capture (e.g. as a condition of grant funding).</p>	<p>Defra, CLA, NFU, Forestry Commission, Woodland Trusts</p>
<p>Action M(iii) 7: Promoting wood products in construction</p> <p>Actively promote and require the use of wood products in construction etc., as substitutes for steel, blockwork, and other less sustainable materials.</p> <p>Note that the BREEAM and EcoHomes assessments include the environmental implication of the building materials used and encourage the specification of timber from responsible forest sources and harvested forests / plantations. Potentially this could be extended to recognise the use of wood as a substitute for less sustainable materials.</p>	<p>Local planning authorities, ODPM, BRE, developers and their advisers (e.g. architects, surveyors and engineers)</p>
<p>Action M(iii) 8: Carbon accounting</p> <p>Develop and support land managers to produce greenhouse gas and carbon accounting audit.</p> <p>Investigate carbon accounting of carbon sinks and the influence on forest management choices.</p>	<p>Defra, Forestry Commission, CLA, land managers</p>
<p>Action M(iii) 9: Advice to land managers</p> <p>Extend the advice provided by the Carbon Trust to encourage land managers and rural businesses.</p>	<p>DTI, Carbon Trust, Forestry Commission, CLA, land managers</p>

Mitigation: (iv) Encouraging development and use of renewable energy

What is the issue?

The Government is committed to increasing the proportion of electricity which comes from renewable energy⁵⁶ to 10% by 2010, and to 20% by 2020⁵⁷. This requires new renewable energy developments, both stand alone schemes, and those associated with other new and existing developments.

The South East has started from a very low base of renewable energy development. The region generated less than 1% of electricity from renewable sources in 2003, mostly from landfill gas. The South East Plan includes regional targets for renewable energy (Policy EN3). The minimum target for 2020 is 1130MW installed capacity (equivalent to 10% of the region's electricity generation capacity). An intermediate minimum target of 620MW installed capacity is set for 2010. As of November 2005, there was 294MW installed capacity operational within the region (most from landfill gas, off-shore wind, biomass and co-firing). There was also 120MW which has planning permission but is not yet operational. In order to meet commitments it is clear a step-change in the level of development over the coming years is required.

How is the issue being addressed?

Some of the key existing activities and actions to encourage renewable energy are summarised below.

Research and information

Example organisations involved in research include: British Biogen, British Wind Energy Association, Carbon Trust, DTI, Energy Saving Trust, National Energy Foundation, Renewable Energy Operators, Renewable Power Association, Renewables Advisory Board, Sustainable Development Commission, Tyndall Centre for Climate Change Research. The Government has also set up a task force to analyse barriers to the development of energy crops.

SEE-Stats⁵⁸, South East Renewable Energy Statistics, is an initiative undertaken by TV Energy and sub-regional data partners on behalf of the South East of England Sustainable Energy Partnership (see below), The aims of SEE-Stats are to monitor progress towards regional and sub-regional targets, and to promote existing and prospective installations whilst publicising their technical data and various benefits to stakeholders and the people of the South East of England.

The Countryside Agency is investigating opportunities to use the region's forest resource as a supply of timber and leisure resource as well as a renewable resource for power generation, particularly combined heat and power systems. The South East region has largest proportion of forest of any region in England.

Awareness raising and building partnerships

The South East Sustainable Energy Partnership (SESEP) comprises representatives from GOSE, SEEDA, the Regional Assembly, County Councils, the Forestry Commission and sub-regional lead

⁵⁶ Renewable energy uses energy flows that occur naturally and repeatedly in the environment (PPS22: Renewable Energy) – these comprise energy flows from the wind, the sun, water (including wave power) and biomass. It is a sustainable alternative to fossil fuels, and does not generate additional greenhouse gas emissions.

⁵⁷ Our energy future – creating a low carbon economy, DTI, 2003.

Final Report (March 2006)

partners: Thames Valley Energy partnership, Kent Energy Centre, The Environment Centre (Hampshire and the IoW), and The Energy Conservation and Solar Centre (East and West Sussex). The partnership exists to share best practice, support local projects and raise awareness of the benefits and opportunities of renewable energy in the region⁵⁹. Members run workshops and promotional events and support local networks, e.g. the Kent Renewable Energy Network. SESEP has a Business Plan (2005/06) which sets out details of activities to be undertaken by partners, many of which will help to implement policy CC2 part iv. The activities are under ten objectives:

- improving regional co-ordination mechanisms;
- capacity building in the sub-regions;
- regional targeting and monitoring;
- supporting the planning system;
- regional promotion;
- support to flagship developments as regional exemplars;
- regional co-ordination for energy efficiency and reducing energy demand;
- improving regional co-ordination of fuel poverty;
- knowledge transfer, business and economic development; and
- maximising the regional potential for woodfuel and biomass as key regional resource.

The partnership supported the promotion of ENTHUSE – A Toolkit for Local Authorities developed by IT Power⁶⁰. It also promoted a number of locally based projects, including RENAISSANCE, a European funded project to develop an energy centre in Bracknell town centre⁶¹, to incorporate a district heating, cooling and power system, fuelled by biomass, to serve the town centre. Other projects include a Hydro Feasibility Study in Kent, Isle of Wight Community Wind Project and the Hampshire Solar Streets Project⁶².

Developing policy and strategy

The draft South East Plan Policies EN1-6 will help to implement policy CC2 part iv. These promote the use and incorporation of renewable energy sources in new development, set renewable energy targets for the region and sub-regions based on installed capacity (MW), and direct local planning authorities to provide guidance on renewable energy development in development plans.

Example 6: Woking renewable and sustainable energy

Woking Borough Council is one of the most energy efficient local authorities in the UK and is the only local authority in the UK to supply customers with electricity on private wire combined heat and power (CHP) and renewable energy networks. In 1999 it set up Thamesway Limited, the UK's first Energy and Environmental Services Company, and Thamesway Energy Limited, a public/private joint venture energy services company. Over the last decade, the council has implemented a series of energy efficiency and environmental projects, including the UK's first small scale CHP/heat fired absorption chiller system, the first condensing boiler scheme for private sector housing, the first local authority private wire residential CHP schemes, the largest domestic photovoltaic/CHP installations, the first local sustainable community energy systems and the first hydrogen fuel cell CHP. Over this period, the council reduced energy consumption by over 40% and carbon dioxide emissions by over 66% (78,605 tonnes). Financial savings achieved by energy efficiency projects have amounted to almost £4.7 million over the same period.

The climate change strategy for Woking sets targets for further emissions reductions over the next decade, providing the context for the council's activities over this period. The progress Woking Borough Council has made has been possible due to strong leadership and support for the initiatives by all three major political parties. It demonstrates what is possible and could be replicated in the region.

Case study taken from: The South East England regional Assembly (2003) *Harnessing the Elements Supporting - Statement to the Proposed Alterations to Regional Planning Guidance, South East – Energy Efficiency and Renewable Energy*

⁵⁸ www.see-stats.org

⁵⁹ South East Sustainable Energy Partnership (SESEP) www.go-se.gov.uk > environment and rural > energy. See also www.see-stats.org > about SEE-stats

⁶⁰ www.enthuse.info - The website includes the toolkit, information, guidance and case study examples of local authority based renewable energy schemes in the UK (e.g. Leicester) and Europe.

⁶¹ www.tvenergy.org/news-bracknell1.htm - The website also includes case study examples of operational renewable energy schemes e.g. Buckinghamshire County Council's PV array installation.

⁶² SESEP Annual Report 2003-2004 www.go-se.gov.uk > environment and rural > energy > south east sustainable energy partnership (SESEP)

Planning Policy Statement (PPS) 22 Renewable Energy (2004)⁶³ sets out policies and good practice guidance which provide a positive planning framework to encourage renewable energy development. This positive approach should be reflected in development plans at the regional and local level, which should not restrict renewable energy development.

The Government has recently published a Microgeneration Strategy (DTI, 2006)⁶⁴ which seeks to create the conditions under which microgeneration becomes a realistic alternative or supplementary energy generation source for householders and communities.

What barriers need to be overcome?

Key barriers to encouraging development and use of renewable energy include:

- A lack of flagship renewable energy projects in the region⁶⁵.
- In relation to microgeneration, upfront costs, poor information, technological and constraining planning policy and Building Regulations.
- Opposition to renewable energy developments at the local level and inaccurate public perceptions of technologies (e.g. biomass).
- Delays in commissioning approved schemes, for example, due to a shortage of grid capacity, securing wayleave rights, landowner negotiations, negotiating planning obligation agreements and agreeing / discharging planning conditions, and procuring turbines / other supplier contracts. In addition, offshore wind and biomass schemes are often economically marginal (Renewables Innovation Review, DTI and Carbon Trust, 2004).

What are the priorities for action and who are the key players?

Table 6: Priority actions for encouraging the development and use of renewables

Priorities for actions	Key players
<p>Action M(iv) 1: Renewable energy targets in DPDs and SPDs</p> <p>Include renewable energy requirements and targets for new development in DPD policies, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance for Developers, architects informatives) (see draft South East Plan Policies EN1, EN3 and EN4)⁶⁶.</p> <p>Note that these standards should be treated as minimum targets and Local Planning Authorities and developers should aspire to exceed them wherever possible.</p>	<p>Local planning authorities</p> <p>Developers and their advisers (e.g. architects, surveyors and engineers)</p>
<p>Action M(iv) 2: Integrating CHP and mini / micro CHP in developments</p> <p>Encourage the integration of CHP and mini / micro CHP in all major developments in DPD policies, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance for developers, architects informatives) (see draft South East Plan Policies EN1 and EN2).</p> <p>Use wider local authority powers to promote awareness of the benefits of mini and micro-CHP in the existing building stock (see draft South East Plan Policies EN1 and EN2). Use public buildings / developments as exemplar projects.</p>	<p>Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers)</p> <p>Local authorities, SESEP, SEEDA</p>

⁶³ and the Companion Guide: Planning for Renewable Energy (2004)

⁶⁴ DTI (March 2006) *Microgeneration Strategy – Our Energy Challenge, Power for the People*. www.dti.gov.uk > energy > environment

⁶⁵ This has partly been addressed by the SESEP regional award scheme and support to flagship development etc

⁶⁶ Policy EN1 (i) requires development to provide at least 10% of the development's energy demand from renewable sources for housing schemes of over 10 dwellings and commercial schemes of over 1,000m². Policies EN3 and 4 set regional and sub-regional renewable energy targets respectively.

Priorities for actions	Key players
<p>Action M(iv) 3: Implementation of South East Sustainable Energy Partnership Business Plan</p> <p>Implement the South East Sustainable Energy Partnership Business Plan. Planned activities include those under the following topics:</p> <ul style="list-style-type: none"> • capacity building in the sub-regions • supporting the planning system • regional promotion of sustainable energy • supporting flagship exemplar developments • maximising the regional potential for wood fuel and biomass <p>See South East Sustainable Energy Partnership website for more information⁶⁷.</p>	SESEP, SEEDA, the Regional Assembly, Local authorities, TV Energy
<p>Action M(iv) 4: Renewable energy capacity at public sector sites</p> <p>Improve energy efficiency and increase renewable energy capacity when refurbishing building stock / institutions, including local authorities, hospitals, schools, universities and other public sector sites to lead by example.</p>	Local authorities, education authorities, PCTs, SESEP
<p>Action M(iv) 5: Review of regional renewable energy targets</p> <p>Review regional renewable energy targets and consider whether these should focus on consumption levels rather than installed capacity.</p>	The Regional Assembly, SESEP, SE Forum for Sustainability, SEEDA
<p>Action M(iv) 6: Government support for small-scale renewables</p> <p>Lobby government for better support for small-scale renewables, such as solar water heating and small wind turbines, including tackling financial, technical, information and regulatory constraints.</p>	The Regional Assembly, SEEDA SESEP DTI, Ofgem
<p>Action M(iv) 7: Amend PPS2 to include requirement for LDDs to set renewable energy targets</p> <p>Lobby ODPM to amend Planning Policy Statement 2 so that it includes a requirement for LDDs to set renewable energy targets.</p> <p>Note: The London Plan incorporates renewable energy targets which are being implemented through London Borough LDDs. Similar standards should be applied outside London.</p>	The Regional Assembly, SESEP, SEEDA ODPM
<p>Action M(iv) 8: Developing renewables supply chain</p> <p>Encourage supply chain development, especially for biomass (it is important that a market and associated systems of transport and processing of biomass is developed in parallel with production capacity).</p>	SEEDA, BioRegional Wood fuel network, SESEP
<p>Action M(iv) 9: Promote biomass energy crops</p> <p>Provide advice to farmers on plant biomass energy crops to meet the needs of renewable energy market⁶⁸.</p> <p>Plant biomass energy crops to meet needs of renewable energy market.</p>	Defra, NFU, CLA, agricultural consultants Farmers
<p>Action M(iv) 10: Supporting bio-fuels</p> <p>Adopt new and alternative crops which offer drought resilience and / or potential use as bio-fuels.</p> <p>Promote cultivation of wheat for production of bio-ethanol and cultivation of oilseed rape for production of bio-diesel.</p> <p>Lobby Government to support the commercial viability of bio-fuels through reducing duties on wheat and oilseed rape production. Highlight the environmental and economic benefits of bio-fuel production.</p> <p>Promote 'road transport fuel obligations' (RTFO) that impose a requirement for a proportion of fuels to be made up of fuels sourced from renewables (e.g. bio-fuels), in the same way that there is an obligation electricity producers to source energy from renewables.</p>	The Assembly, SEEDA, Defra, NFU, CLA, agricultural consultants, farmers, DTI, DoT
<p>Action M(iv) 11: Forestry products for renewable power generation</p> <p>Utilise forestry products for renewable power generation, particularly combined heat and power.</p>	Countryside Agency, Forestry Commission, woodland owners

⁶⁷ www.gose.gov.uk > environment and rural > energy > South East Sustainable Energy Partnership

⁶⁸ British BioGen are the Trade Association to the UK Bioenergy Industry, promoting and co-ordinating the commercial development of biomass as a renewable fuel resource for energy production www.britishbiogen.co.uk

Mitigation: (v) Reducing the amount of biodegradable waste landfilled

What is the issue?

Greenhouse gases are emitted from biodegradable waste as it decomposes. When oxygen is available the main landfill gas produced is carbon dioxide, but in anaerobic conditions around half the emissions are methane. Methane is the second of the 'basket' of greenhouse gases⁶⁹ and is much more potent than carbon dioxide per unit. Landfills released 25% of the UK's methane emissions in 2001, which represents 2% of the world's total greenhouse gas emissions⁷⁰.

The diversion of biodegradable municipal waste from landfill is a key objective under the EU Landfill Directive⁷¹. The Directive imposes strict engineering requirements on sites and requires that landfill gas is captured. It also sets strict limits for the amount of biodegradable municipal waste which is disposed of to landfill. By 2010 in the UK, biodegradable municipal waste disposed of to landfill must be reduced to 75% of the amount produced in 1995; by 2013 this is reduced to 50% and by 2020 to 35%. Waste will be diverted from landfill by increased recycling, composting and recovery of energy from waste. Incineration with energy recovery should only be considered once opportunities for recycling and composting have been explored⁷².

In 2003 methane emissions from landfill had fallen by 66% from 1990 levels⁷³ due to the collection of landfill gas for energy recovery and better environmental control, and total methane emissions were 48% below those in 1990.

How is the issue being addressed?

Some of the key existing activities and actions to reduce the amount of biodegradable waste landfilled are summarised below.

Research, information, awareness raising and building partnerships

Examples of organisations researching and providing information include the Waste and Resources Action Programme (WRAP)⁷⁴, supported by Defra. In the South East region, Egeneration.co.uk is a single point of access to wide range of services, support and advice for businesses on sustainable performance, including waste management.

The South East Sustainable Business Partnership includes sub-regional partnerships for Buckinghamshire / Berkshire, East Sussex, Hampshire / Isle of Wight, Kent, Oxfordshire, Surrey and West Sussex. The partnerships act as a signpost to the wealth of environmental information and support, highlighting opportunities to make environmental improvements and savings e.g. through sustainable waste management.

South East Waste Advisory Group (SEWAG), a sub-group of the South East Region Technical Advisory Body (SERTAB), includes representatives from: County, Unitary and District/Borough waste collection and disposal authorities; The Environment Agency; SERTAB; South East England Regional

⁶⁹ www.environment-agency.gov.uk > your environment

⁷⁰ Limits set on the landfilling of waste 52/05. Defra press release 3.2.05: www.defra.gov.uk/news > 2005 > 3 February 2005

⁷¹ EU Landfill Directive [1999/31/EC]

⁷² PPS10: Planning for Sustainable Waste Management, ODPM, 2005.

⁷³ Greenhouse gas emissions figures 134/05. Defra press release 21.3.05: www.defra.gov.uk/news > 2005 > 21 March 2005

⁷⁴ WRAP's mission is to accelerate resource efficiency by creating efficient markets for recycled materials and products, while removing barriers to waste minimisation, re-use and recycling. See www.wrap.org.uk for more details.

Assembly; South East England Regional Development Agency; ReMaDe Kent & Medway (develops markets for recyclable products in Kent and Medway); and DEFRA Waste Implementation Programme Local Authority Support Unit.

Developing policy and strategy

The waste and minerals policies incorporated into the draft South East Plan focuses on sustainable resource management, including the need to reduce the quantity of waste produced and to move from waste disposal to waste processing. Key policies in relation to biodegradable waste are:

- *W5: Targets for Diversion from Landfill* – includes regional five year targets for the diversion of all waste types.
- *W6: Recycling and Composting Targets* – includes the target that 40% of municipal solid waste must be recycled or composted by 2010 and 55% by 2020.
- *W8: Waste Separation* – separate collections of recyclable and compostible waste must be provided as soon as possible. Separation at source produces the best levels of recycling and composting.
- *W11: Biomass* – encouragement of the separation of biomass waste and considering use as a fuel where it does not discourage recycling and composting.

PPS10: Planning for Sustainable Waste Management (2005) sets out the Government's planning policies for waste management. It concentrates on the need to reduce, re-use and recycle waste (according to the waste hierarchy), and to provide sites for the necessary waste management facilities with reference to principles including self-sufficiency, proximity as well as other locational criteria.

The Household Waste Recycling Act 2003 places a duty upon local authorities to provide a collection of at least two types of recyclable waste from every household by 2010.

Fiscal measures

The Government introduced the Landfill Allowances Trading Scheme in England on 1st April 2005 to help ensure the requirements for the Landfill Directive are met. Reduction targets for the amount of biodegradable municipal waste disposed to landfill have been assigned to waste disposal authorities and can be 'traded'. There are financial penalties for authorities which exceed their landfill allowance. The Government intends that the scheme should benefit councils such as Isle of Wight District Council and Windsor and Maidenhead Borough Council who collected, composted and recycled over 25% of household waste produced in their areas during 2002/03. Support for kerbside collections is provided through the WRAP ROTATE programme (www.wrap.org.uk).

What barriers need to be overcome?

Key barriers to reducing the amount of biodegradable waste landfilled include:

Example 7: The CROWN (Composting and Recycling Our Waste Now) Strategy

The CROWN (Composting and Recycling Our Waste Now) Strategy was developed by Wealden District Council. A key aim of the scheme is to address the biodegradable element of household waste, which can account for as much as 30% of the total.

Wheeled bins were provided to householders for collecting biodegradable waste, mixed paper, cans and foil and residual household waste. The biodegradable waste is taken away by a private contractor for 'on-farm' composting, which will be used as a soil conditioner.

The scheme has reduced total waste arisings by 15% and has significantly increased community awareness about the waste that people are producing.

Source: www.southeast-ra.gov.uk > publications > regional strategies > regional waste management strategy

- There is an urgent need for a range of new waste management facilities, particularly for recovery, and a lack of systems for the separate collection of organic materials and their extraction from mixed waste streams⁷⁵.
- Insufficient facilities developed for recycling / composting / energy recovery (due to, for example: planning delays, local opposition, difficulties relating to land values).
- Insufficient home composting.
- Lack of financial penalties if reduction targets are not met for reducing landfill of biodegradable commercial / industrial waste and construction / demolition waste.
- Lack of ability to co-manage commercial and municipal waste due to artificial barrier create by different contracts

What are the priorities for action and who are the key players?

Table 7: Priority actions for reduce the amount of biodegradable waste landfilled

Priorities for actions	Key players
<p>Action M(v) 1: Allocation of waste sites in DPDs</p> <p>Ensure there is a positive planning framework is in place, including allocation of sites in waste DPDs to support the provision of sites for waste management facilities, including those to compost / treat biodegradable waste.</p> <p>These sites should provide sufficient capacity to achieve the recycling and composting targets to be included in the draft South East Plan.</p>	Local planning authorities, Waste planning authorities, South East Waste Advisory Group, GOSE.
<p>Action M(v) 2: Waste minimisation in LDDs</p> <p>Include requirements for new development to be designed and constructed to minimise waste production and associated impacts through the re-use of construction and demolition materials, and promote layouts and design that provides adequate space to facilitate storage, re-use, recycling and composting in DPD policies, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance or Developers, architects informatives)</p>	Local planning authorities, Waste planning authorities,
<p>Action M(v) 3: Energy from waste and anaerobic digestion in LDDs</p> <p>Include energy from waste and anaerobic digestion in DPD policies and SPDs (area and topic based) as part of an integrated approach to waste management where it does not discourage recycling and composting and promote use of CHP wherever possible (to maximise the amount of energy recovered and fossil fuels displaced).</p>	Local planning authorities, Waste planning authorities,
<p>Action M(v) 4: Kerbside collection for biodegradable waste</p> <p>Waste collection and disposal authorities to provide separate kerbside collection for biodegradable waste (whether household / community based).</p> <p>Householders and small and medium-sized businesses should be encouraged to separate waste for collection through information and promotional campaigns.</p>	Waste collection authorities, Waste disposal authorities, waste management companies, DEFRA Waste Implementation Programme Local Authority Support Unit, householders, businesses
<p>Action M(v) 5: Organisation of civic amenity sites to facilitate re-use and recycling</p> <p>Civic amenity sites should be organised to encourage separation of materials for re-use and recycling, including green waste.</p>	Waste collection authorities, Waste disposal authorities,
<p>Action M(v)6: Home composting</p> <p>Increase home composting through information and promotional activities.</p>	Waste collection authorities, Waste disposal authorities, DEFRA Waste Implementation Programme Local Authority Support Unit
<p>Action M(v) 7: Incentives to increase diversion of biodegradable waste from landfill</p> <p>Explore and deliver ways to increase diversion of biodegradable waste from landfill for</p>	Defra, HM Treasury, WRAP, SESBP

⁷⁵ Para. 2.38, Proposed Changes to Regional Planning Guidance for the South East (RPG9) - Waste and Minerals, GOSE, August 2005.

Priorities for actions	Key players
commercial / industrial and commercial / demolition waste including financial incentives and penalties.	
Action M(v) 8: Investment in energy recovery Invest in energy recovery, including anaerobic digestion of biodegradable waste to produces biogas which following treatment can be burned to generate electricity and/or heat and incineration of mixed waste with energy recovery, as part of an integrated approach that allows for the highest levels of recycling and recovery of material practicable.	Waste management industry
Action M(v) 9: Increase resource efficiency Work in partnership to reduce and recycle waste and develop markets for recycled / reused goods.	Local authorities, The Regional Assembly, SEEDA, Envirowise, WRAP
Action M(v) 10: Waste contracts Ensure waste contracts are formulated to ensure that incineration will not compromise recycling and composting.	Waste collection authorities, Waste disposal authorities
Action M(v) 11: Research on landfill performance Increase understanding of the impacts of changing climate on landfill performance. Assess and monitor the impacts of climate change on the condition of landfill sites. Plan and research for changing landfill design needs to accommodate potential changes in temperature and rainfall Prepare for long-term landfill planning in relation to climate change especially the location of sites.	Waste management companies / landfill operators, Environment Agency, Waste collection authorities, Waste disposal authorities

Adaptation: (i) Guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence

What is the issue?

The location of development will be an important factor in determining its exposure to the impacts of climate change. With parts of the region likely to be at a greater risk than others from the impacts such as flooding, water shortages and drought, sea level rise, storminess and soil subsidence and heave. Therefore, new development should be guided to locations that best offer protection from these impacts. For example, with 208,000 existing properties in the South East identified as being within Zone 3⁷⁶ of the Environment Agency's Flood Zone map, avoiding an increase in flood risk through adaptation in the location, as well as design (see adaptation clause ii), of new development and land use is increasingly important in a changing climate.

The capacity of essential services is also a critical factor. In some parts of the region there is a limited capacity for further increases in sewage treatment due to physical constraints or water quality and ecological issues. In these sewage treatment catchments further investment will be required prior to new development, or in extreme circumstances new development should be avoided as problems are too difficult or costly to overcome. Similarly, the existing balance of water supply to demand is very sensitive in parts of the South East, with demand close to exceeding currently available sustainable supply. Water supply in some locations may not be able to respond to increased growth levels in the short term due to the lead times associated with the delivery of necessary infrastructure.

Lowered groundwater levels and clay soil shrinkage may cause subsidence and building damage and subsidence could lead to deterioration of built structures and disruption of road, rail and power supplies (see also adaptation clause ii). Particular areas are more at risk from subsidence, which is likely to be aggravated by climate change, and where developments are at risk they should be designed to cope with increased subsidence risk (e.g. design of foundations and the positioning and choice of trees).

Climate change is also likely to increase coastal erosion, erosion of salt marshes and the risk of landslides due to sea level rise and storm surges. This will pose a greater risk along certain lengths of coast in the South East.

How is the issue being addressed?

Some of the key existing activities and actions to guide the strategic location of development are summarised below.

Research and information

At the national level, considerable research is ongoing into the effects of climate change on flood risk, including the joint Defra/Environment Agency flood and coastal erosion risk management R&D programme. Royal Town Planning Institute (RTPI) is working to build climate change scenarios incorporating spatial awareness elements. The Planning Officers Society is conducting research into sustainable construction with the intention to prepare a model policy for use in local development frameworks.

⁷⁶ Zone 3 of the Environment Agency's Flood Zone map is the area where risk of flooding is 1% for fluvial and 0.5% for tidal.

The SECCP co-ordinated the SECTORS project⁷⁷, which includes consideration of the key issues and responses by different sectors to climate change many of which have a spatial dimension. The BRANCH⁷⁸ (Biodiversity Requires Adaptations in Northwest Europe under a CHanging climate) project is considering the spatial planning implications for biodiversity of a changing climate. This includes the implications for the location of development to ensure that options for the expansion and migration of habitats and species are not foreclosed by development (see Adaptation v).

The Three Regions Climate Change Group's checklist for development adapting to climate change includes guidance on the location of development, such as how the choice of location will be affected by: flooding; higher temperatures; water resources; subsidence; and coastal erosion⁷⁹.

PPG25⁸⁰ and the sequential test seek to ensure development is accommodated outside flood risk areas. The Environment Agency's Flood Zone Maps provide the starting point for determining which areas are at most risk and Strategic Flood Risk Assessments (SFRA) should be used to inform catchment-wide planning issues. Developments in known current or potential future flood risk areas may face difficulties in obtaining insurance for flood damage in the future, which must be considered when identifying development sites⁸¹.

The Environment Agency prepares and updates Flood Zone Maps. The Environmental Agency and local planning authorities provide guidance and support to ensure that new developments consider risk from future climate change, particularly flood risk and subsidence. The Environment Agency has also prepared water supply and deficit maps specifically for the South East Plan.

Water companies are undertaking work to identify areas with limited capacity for further increases in sewage treatment requirements due to physical constraints or water quality and ecological issues. This will identify and map sewage treatment catchments where further investment is required prior to new development or in extreme cases where development should be avoided.

Awareness raising and building partnerships

The South East Climate Change Partnership (SECCP)⁸² co-ordinates and brings together stakeholders investigating, informing and advising on the threats and opportunities arising from climate change impacts in the South East.

The ESPACE⁸³ project (see example box) is raising awareness of the importance of adapting to climate change promoting its incorporation within spatial planning mechanisms at local,

Example 8: European Spatial Planning: Adapting to Climate Events (ESPACE)

The ESPACE Interreg IIBB project aims to identify and implement measures to adapt to climate change in spatial planning (see www.espace-project.org). This 4 year project includes partners from the Netherlands, Belgium and Germany, as well as the South East Regional Assembly, Environment Agency, Hampshire County Council, Surrey County Council, West Sussex County Council and the South East Climate Change Partnership.

Concepts and approaches implemented in partner regions have been incorporated where possible into the draft South East Plan, which as part of this project must demonstrate that the predicted effects of climate change, and means of adapting to these, have been incorporated into its policies. This includes work on water resources, water quality and flood risk management.



⁷⁷ www.climatesoutheast.org.uk > publications

⁷⁸ www.branchproject.org.uk

⁷⁹ Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate www.london.gov.uk > mayor of london > sustainability > london climate change partnership > a checklist for development

⁸⁰ Policy Planning Guidance (PPG) 25 on development and flood risk www.odpm.gov.uk > planning > planning policy > planning policy guidance notes. Note that ODPM recently consulted on a draft Planning Policy Statement (PPS) 25 on development and flood risk www.odpm.gov.uk > planning > consultation papers > archived

⁸¹ The Association of British Insurers Report (ABI) ABI has published a statement of principles on the provision of flooding insurance, which indicates that where the risk of flooding is unacceptably high and no improvements in flood defences are planned insurers cannot guarantee to maintain cover; insurers will examine the risks on a case by case basis. www.abi.org.uk > information zone > for consumers > flooding

⁸² www.climatesoutheast.org.uk

⁸³ www.espace-project.org

regional, national and European levels.

Developing policy and strategy

The draft South East Plan is addressing the strategic location of development through several policies, including:

Policy NRM1 Sustainable water resources, groundwater and river water quality management which sets the context for preparing LDDs and determining planning applications in relation to water supply, water quality and water treatment and ensuring compatibility with other plans and strategies, such as River Basin Management Plans (RBMPs), Regional Water Resource Strategies, Catchment Abstraction Management Strategies (CAMS) and groundwater vulnerability and source protection.

Policy NRM3 Sustainable flood risk management which sets the context for preparing LDDs and determining planning applications in relation to PPG25 and flood risk, including undertaking Strategic Flood Risk Assessments (SFRA), and ensuring compatibility with other plans and strategies, such as RBMPs, Catchment Flood Management Plans (CFMPs) and Shoreline Management Plans (SMPs).

Policy NRM6 Coastal management which sets the context for developing and implementing LDDs and other strategies including restricting development where it will compromise flood risk, prejudice future options, be on unstable land or land at risk from erosion or not be in character with the undeveloped coast.

Some local authorities have prepared local climate change action plans / strategies and climate change checklists for developers (for example, Woking⁸⁴), which help guide the location of development.

Several other plans and strategies are being prepared which should be used to guide the location of development, including those referred to in policies NRM1, 3 and 6. Coastal Habitat Management Plans (ChaMPs) are being prepared for all relevant coastal cells in the South East. Sustainable flood risk management is being promoted through the production and implementation of CFMPs for all the catchments in the region. RBMPs are being prepared (2004-2009) for the two river basins in the South East (i.e. the Thames and the South East) and the programmes of measures from the RBMPs for the river basins in the South East will be subsequently implemented (2009 onwards).

An Association of British Insurers (ABI) report *A changing climate for insurance* was published in June 2004⁸⁵. It notes that much of the industry's work over the next few years will concentrate on the implications of climate change for homeowners and businesses. Erratic and extreme weather will require changes in underwriting practices and claims handling by property insurers. The ABI has also published a statement of principles on the provision of flooding insurance, which indicates that where the risk of flooding is unacceptably high and no improvements in flood defences are planned insurers cannot guarantee to maintain cover; insurers will examine the risks on a case by case basis.

The Government is reviewing Planning Policy Guidance Note 25: Development and Flood Risk and has published a draft Planning Policy Statement (PPS) for consultation.⁸⁶

Asset Management Planning (AMP) is the process by which the Office of Water Services (Ofwat), determines the programme of water infrastructure and environmental improvements that will be funded and the water bill price rises that will be allowed to fund this. Planning for the next AMP round

⁸⁴ www.woking.gov.uk > planet woking > climate change strategy

⁸⁵ www.abi.org.uk > publications > flooding and climate change

⁸⁶ www.odpm.gov.uk > planning > consultation papers

will start shortly and must be completed by the end of 2009 to define the measures to be completed between 2010 and 2015. The extent to which climate change will be taken into account will ultimately depend on Ministerial guidance.

What barriers need to be overcome?

Key barriers to guiding strategic development to locations offering greater protection from impacts such as flooding, erosion, storms, water shortages and subsidence include:

- Uncertainty about the nature, complexity and extent of climate change and its impacts making strategic planning difficult and used as justification for inaction.
- Lack of joined up policy within and between different levels of decision-making (e.g. national, regional and local) and between different sectors acting as a barrier to better spatial planning.
- Cost of relocation of facilities and infrastructure, such as underground cabling.
- The regional economy being dependent on increasing travel rather than local networks and the challenge of changing individuals' behaviour.
- Factors other than location, such as increased energy demand through rising use of white goods, exacerbating the situation.
- Pressure to deliver development within urban areas which, although otherwise beneficial for sustainability, could increase risk of flooding.
- Limitations for long-term planning of the funding arrangements under the Periodic Review process for water infrastructure.

What are the priorities for action and who are the key players?

Table 8: Priority actions for the guiding the strategic locations of development

Priorities for actions	Key players
<p>Action A(i) 1: Flood risk in DPDs and SPDs</p> <p>DPDs and SPDs should take account of flood risk and allocate / safeguard land for water (e.g. realignment, set backs, storage). When developing DPD policy:</p> <ul style="list-style-type: none"> • Adopt a risk-based approach to development in, or affecting, flood risk areas by carrying out a sequential test. • Identify areas of flood risk and designate flood washlands/storage areas. Such decisions should factor in possible future requirements for flood storage as climate change leads to increased flood intensities (see Adaptation iv)⁸⁷. • Identify where there may be pressures on sewerage systems, which may be exacerbated during heavy rainfall. Some areas in the South East are very constrained and water companies are mapping where there are pressures on sewerage systems. 	<p>Local planning authorities, Environment Agency</p> <p>Water companies, Environment Agency</p>
<p>Action A(i) 2: Baseline for SEAs and SAs</p> <p>Incorporate climatic changes into predicting the future baseline situation and the assessment of significant effects as part of Sustainability Appraisals (SAs) of LDDs and Strategic Environmental Assessments (SEAs) of other plans and programmes within the region.</p>	<p>Local planning authorities</p>
<p>Action A(i) 3: Assessments of communications network and infrastructure</p> <p>Carry out strategic impact assessments on communications networks and infrastructure and ensure that transport and communications planning and strategy accounts for climate change.</p>	<p>Energy providers, Telecoms industry, Highways Authorities, Network Rail, Highways Agency, Local Planning Authorities, SECCP</p>

⁸⁷ see case study 10 *ESPACE Guiding Models for Water Storage*, which illustrates how this approach is being developed in the Netherlands.

Priorities for actions	Key players
<p>Action A(i) 4: Strategic approach to flood risk management in DPDs</p> <p>Where flooding is a particular problem, the core strategy DPD should set out the Local Planning Authority's strategic approach to planning in relation to flooding, following on from the regional approach (draft South East Plan policies CC2 and NRM3) and incorporating the need to mitigate and adapt to climate change.</p> <p>Area and site specific allocations of land for new development in DPDs should follow the risk-based approach and sequential test set out in PPG25 (and in the draft PPS25) which directs new development to areas of little or no risk before other areas are considered⁸⁸. This assessment of risk should take account of the effects of climate change and may need to include a Strategic Flood Risk Assessment (SFRA) on a district or wider (e.g. river catchment) basis.</p> <p>Where land for new development must be allocated within or affecting areas at risk of flooding, DPDs should include a policy requiring that sites may only be developed if measures are taken to minimise the risk of flooding on and off site and to minimise the risk to people and property if flooding does occur. It may be appropriate to refer to the following in policy: development zoning, land raising and raising floor levels, flood warning, compensatory flood storage, management of development runoff, use of flood defences and pumping to drain the low-lying area behind defences⁸⁹.</p>	Local planning authorities, Environment Agency
<p>Action A(i) 5: Water resources and water quality in DPDs and SPDs</p> <p>Incorporate relevant policies on water resources, water supply and water quality to avoid depletion and pollution in core strategy DPDs as well as within generic development control policies and SPDs within all South East planning authorities⁹⁰.</p> <p>Incorporate need to avoid development in locations with current or future water supply or waste water treatment deficits in DPDs and identify funds to deliver necessary infrastructure.</p> <p>Ensure the timely upgrades of water supply or wastewater treatment where development can be accommodated in DPD policies, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance or informatives).</p>	Local planning authorities, Environment Agency, Ofwat, developers, water companies
<p>Action A(i) 6: Flood risk and development sites</p> <p>When identifying development sites, developers should avoid sites in known current or potential future flood risk areas and be aware that properties may face difficulties in obtaining insurance for flood damage in the future (using ABI advice).</p>	Developers and their advisers (e.g. architects, surveyors and engineers), Local Planning Authorities, insurance companies / ABI
<p>Action A(i) 7: Flood risk assessments</p> <p>Flood risk assessments are used to manage current at risk development and avoid developing in at risk areas in the future including floodplains and coastal margins.</p>	Developers and their advisers (e.g. architects, surveyors and engineers), Local planning authorities
<p>Action A(i) 8: Assessment of high risk locations</p> <p>Identify locations in the region that will be at highest risk from the effects of the combined effects of sea level rise, storminess and wave patterns. Prepare risk minimisation strategies.</p>	Environment Agency, Local planning authorities, ABI, Defra
<p>Action A(i) 9: Flood risk management plans and strategies</p> <p>Incorporate relevant policy context on climatic changes and future flood risk from CFMPs, flood defence strategies, SMPs, CHaMPs etc into DPD policies and SPDs.</p> <p>Local authorities and developers should liaise with the Environment Agency during the development and implementation of flood risk management plans and strategies.</p>	Local planning authorities, Environment Agency, English Nature Developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(i) 10: Funding arrangements for water infrastructure</p> <p>Change the funding arrangement for water infrastructure to facilitate longer term planning</p>	Ofwat, Water companies, Environment Agency

⁸⁸ A model DPD policy and an example good practice are included in Box 7.5 of the Regional Assembly and Environment Agency practitioners guide.

⁸⁹ See Appendices 5A and 5B of the Regional Assembly and Environment Agency practitioners guide which includes a menu of adaptation options to respond to flood risk.

⁹⁰ A model DPD policy and an example good practice are included in Box 6.3 of the Regional Assembly and Environment Agency practitioners guide.

Priorities for actions	Key players
<p>(beyond current 5 year rolling programme) to enable water resource planning to better reflect long-term regional spatial planning and as a means to enable infrastructure to be delivered before demand is too great.</p> <p>Change the reliance on revenue income which inhibits long-term planning and up-front delivery of water infrastructure.</p>	
<p>Action A(i) 11: Linking water resources planning and wider development planning</p> <p>Forge better links between water resources planning and wider development planning processes, as advocated under the Water Framework Directive (building on work underway through the South East Plan as informed by the WRSE Group).</p>	<p>Ofwat, ODPM, Defra, Environment Agency, developers, water companies, Local planning authorities</p>
<p>Action A(i) 12: Outputs from BRANCH</p> <p>Incorporate the outputs of the BRANCH project within LDDs in the South East, including the training package on biodiversity and climate change for stakeholders (focussing on planners) that English Nature intends to roll out.</p>	<p>Local planning authorities, BRANCH, English Nature</p>
<p>Action A(i) 13: Outputs from ESPACE</p> <p>Incorporate the outputs of the ESPACE project within LDDs in the South East, including its work on spatial planning policies which take account of climate change.</p>	<p>Local planning authorities, ESPACE</p>
<p>Action A(i) 14: Risk from subsidence</p> <p>Identify locations at greatest risk from subsidence and modify Building Regulations to reflect this risk.</p>	<p>ODPM, Local planning authorities</p>
<p>Action A(i) 15: Managing and planning for subsidence</p> <p>Identify locations at greatest risk from subsidence and manage and plan for increased subsidence due to shrink-swell of clay soils. Include improved foundation design in new buildings. Promote through planning advice and encouragement (e.g. guidance or informatives) or by other control mechanisms (e.g. Building Regulations), as appropriate.</p>	<p>Local planning authorities, Developers and their advisers (e.g. architects, surveyors and engineers), ODPM, ABI</p>

Adaptation: (ii) Ensuring new and existing building stock are more resilient to climate change impacts

What is the issue?

As discussed under the mitigation principles, improving the resource efficiency of existing and new buildings has an important part to play in reducing greenhouse gas emissions. However, buildings also need to be resilient to climate change impacts, such as increased flood risk (from tidal, coastal, river and heavy rainfall), subsidence and heave, less water supplies and weather changes⁹¹. This may be achieved, in the case of new development, by its location⁹², as well as its design and use of materials. With existing buildings, retrofitting appliances, fixtures and fittings can improve their resilience.

Given the long term climatic changes predicted, buildings will need to be flexible enough to adapt to future conditions and be designed for or adaptable to the climatic conditions expected towards the end of their design life. One of the most significant implications of climate change for buildings will be on heating and cooling requirements. In terms of adaptation to the effects of climate change, a balance has to be struck between ventilation to improve air quality indoors versus air tightness to improve energy efficiency performance and air proofing with increased wind speeds. Other possible adaptations include adopting principles of flood resistant design⁹³.

In addition to existing and new buildings, infrastructure such as transport, energy, telecommunications etc need to be design in such a way as to avoid or minimise the impacts and the potential disruption that could be caused by climate change. Disruption to communications and service infrastructure (e.g. rail networks and energy grid) from storm events, landslides, flooding and temperature changes will impact on the normal functioning and resilience of the economy.

How is the issue being addressed?

Some of the key existing activities and actions to ensure new and existing building stock are more resilient to climate change impacts are summarised below.

Research and information

There is considerable research going on at a national level on the resilience of buildings to impacts that are likely occur as a result of a changing climate. The Building Research Establishment (BRE) Energy Efficiency Programme and Environmental Programmes research into, for example: wind-loading and building resilient to high wind-speeds; flood defence – how buildings can be protected and made more resilient; reinstatement options for flooded buildings; water efficiency mechanisms and water infrastructure requirements; foundation design and other general construction issues e.g. minimising the effects of water level changes; and likely impacts on building stock and how to repair / reinstate buildings⁹⁴.

⁹¹ Note that sustainable drainage and water efficiency are specifically dealt with under principle iii, flood storage and developing sustainable new water resources under principle iv and sustainable flood management under principle v

⁹² see adaptation principle i

⁹³ e.g. putting living accommodation on the first floor, building on stilts, increased capacity of roof drains and internal design measures such as solid and raised floors, flood resistant plaster and other materials, one-way valves on sewerage and putting services such as electrical sockets above expected flood levels. Resilience also includes enabling safe access in times of flood.

⁹⁴ www.bre.co.uk

Information is available for home owners and businesses on flood resilience in the ABI's factsheet on *Flood Resilient Homes*⁹⁵, the ODPM's *Preparing for Floods*⁹⁶ and the Environment Agency's *Damage Limitation – how to make your home flood resilient*⁹⁷. There is also Agency Standing Advice and CIRIA guidance on flood risk.

Other Information available on climate change impacts related to insurance and risk management, includes other publications by the Association of British Insurers⁹⁸:

- *A Changing Climate for Insurance, summary report for Chief Executives and Policymakers.*
- *Strategic Planning for Flood Risk in the Growth Areas – Insurance Considerations.*

CIRIA⁹⁹:

- *Climate change risks in building - an introduction* (CIRIA publication C638). Author(s): S Vivian, N Williams, W Rogers. 2005.
- *Implications of Climate Change for the Construction Industry – Consideration of Risk in Decision Making*, 2004.

Awareness raising and building partnerships

EcoSE is a partnership set up by the Environment Agency working together to ensure that housing development in the South East takes place in a planned manner and ensure that high environmental standards are included in new homes. It includes: The Regional Assembly, GOSE, SEEDA, Countryside Agency, Southern Water, Mid Kent Water, Pavilion Housing, National Housing Federation South East, WaterVoice, Woking Borough Council, Energy Savings Trust, Building Research Establishment Ltd and the Town and Country Planning Association¹⁰⁰.

Developing policy and strategy

The draft South East Plan is addressing the resilience of new and existing building stock to climate change impacts through several policies, including:

Policy NRM1 Sustainable water resources, groundwater and river water quality management which sets the context for preparing LDDs and determining planning applications in relation to water supply, water quality and water efficiency, including achieving best practice BREEAM standards.

Policy NRM3 Sustainable flood risk management which sets the context for preparing LDDs and determining planning applications in relation to PPG25 and flood risk, including undertaking Strategic Flood Risk Assessments (SFRA), the approach to flood risk management and SUDS.

Example 9: CIRIA advice sheets: Improving the flood resistance of your home

CIRIA has produced a series of advice sheets on improving the resilience of homes to the damaging effects of flooding. These include advice on assessing risk of flooding to a property. For householders whose property is at risk from flooding, the advice notes provide information on practical steps to prevent, or reduce the impact of, flooding in the future.

The sheets are designed to help carry out the work yourself if you are skilled at DIY or a builder, and are also intended to be useful to a householder working with builders and surveyors if they are unable to carry out the work themselves.

The advice sheets include:

- Identifying flood risk
- How does floodwater enter a house above ground?
- How can floodwater enter a house below ground?
- Flood-resilient walls
- Flood-resilient windows and doors
- Flood-resilient floors
- Flood-resilient services
- Flood-resilient sewers and drains

Source: www.ciria.org/flooding > [reducing the impact](#)

⁹⁵ www.abi.org.uk > publications > flooding

⁹⁶ www.odpm.gov.uk > building regulations > building regulations approved documents and associated guidance

⁹⁷ Damage Limitation – How to make your home flood resistant. www.environment-agency.gov.uk/subjects > flood > floodline > online flood library > flood factsheets > preparing for a flood

⁹⁸ www.abi.org.uk

⁹⁹ www.ciria.org

¹⁰⁰ www.ecose.org.uk

ODPM is reviewing Building Regulations to incorporate more sustainable construction standards and has recently published a consultation paper on a Code for Sustainable Homes¹⁰¹ which has the potential to covers issues such as buildings resistant to higher wind-loadings, resilience to flooding, water efficiency, energy efficiency etc.

Three Regions Climate Change Group has produced a checklist for development which includes disseminating best practice projects showing low impact and change resilient construction for housing and property¹⁰².

What barriers need to be overcome?

Key barriers to ensuring new and existing building stock are more resilient to climate change impacts include:

- Short term decisions made based on capital costs of new or refurbished buildings rather than longer term operational costs.
- The perception and actual additional costs required to make buildings more resilient.
- Influencing behaviour requires coherent and strong leadership and national, as well as regional level.
- Lack of firm policy / legal compulsion on developers and home owners in adopt good practice.
- Lack of enforcement of the existing minimum standards and quality of construction work.
- Lacks some of the necessary skills and knowledge in the construction sector.

What are the priorities for action and who are the key players?

Table 9: Priority actions for increase the resilience of new and existing buildings

Priorities for actions	Key players
<p>Action A(ii) 1: Flood Risk Assessments</p> <p>Developers undertake a Flood Risk Assessments (FRAs) for development in certain locations and of certain types in consultation with the Local Planning Authority and the Environment Agency. The FRA should take into account the implications of climate change and build in suitable measures to the development, assuming the feasibility can be demonstrated.</p> <p>Local planning authorities to require FRAs, as appropriate, from developers and seek advice from the Environment Agency on what they should include.</p> <p>Note Environment Agency Standing Advice¹⁰³ and CIRIA guidance¹⁰⁴.</p>	<p>Developers and their advisers (e.g. architects, surveyors and engineers)</p> <p>Local planning authorities, Environment Agency</p>
<p>Action A(ii) 2: Repairs to flooded properties</p> <p>Insurance companies to require that repairs to previously flooded properties are made using flood resistant products and in a flood resistant manner.</p>	<p>Insurance companies, property owners</p>
<p>Action A(ii) 3: Development outside of high flood risk areas</p> <p>Use of techniques to increase flood resilience in new development in areas on or beyond the outer edges of the floodplain as a precautionary measure as the risk of flooding within and beyond the current floodplain is likely to increase with climate change. Also, areas defended to an appropriate standard may suffer a failure of defences or an event above the design standards, which is also increasingly likely with climate change.</p>	<p>Developers and their advisers (e.g. architects, surveyors and engineers)</p>

¹⁰¹ www.odpm.gov.uk > building regulations > consultation papers

¹⁰² *Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate*, Three Regions Climate Change Group comprising Sustainable Development Roundtable for the East of England, London Climate Change Partnership and the South East Climate Change Partnership. Greater London Authority. 2005. www.london.gov.uk > mayor of london > sustainability > london climate change

¹⁰³ See details included in Box 7.4 of the Regional Assembly and Environment Agency practitioners guide. The Standing Advice is available at www.pipernetworking.org > floodrisk.

¹⁰⁴ See details included in Box 7.3 of the Regional Assembly and Environment Agency practitioners guide and *Development and Flood Risk – guidance for the construction industry* (CIRIA 2004) See www.ciria.org > bookshop.

Priorities for actions	Key players
<p>Action A(ii) 4: Use of planning conditions and obligations to increase resilience to flooding</p> <p>Use planning conditions and obligations to secure measures to make new development more resilient to climate change impacts, in particular flooding. Examples include:</p> <ul style="list-style-type: none"> • Incorporating safe access into scheme design. • Raising floor levels and requiring less sensitive uses on the ground floor. • Provision of flood warning, including warning notices. • Flood proofing through the use of temporary barriers. • Design of channel and hydraulic structures.¹⁰⁵ 	Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(ii) 5: Use of informative to raise awareness of flooding issues</p> <p>To raise developers awareness of certain matters, such as flood proofing walls (internal and external) and floors, flood proofing fixtures and fittings and flood proofing gardens, Local Planning Authorities should use informatives attached to consents.</p>	Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(ii) 6: Flood protection in SPDs</p> <p>To address flood risk, include flood protection measures at site and building scale within SPDs (area and topic based).</p>	Local planning authorities
<p>Action A(ii) 7: Information on flood risk</p> <p>Include information on flood risk, flood warning and flood resilience in the new Home Information Packs (required from 2007) and in information provided on newly built homes. Promote the work of the National Flood Forum to raise awareness on flood risk.</p>	ODPM, Environment Agency, developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(ii) 8: Resilience of foundations</p> <p>Consider changes to building control procedures and inspections to ensure foundations are more resilient and allow for wetter conditions.</p>	ODPM, Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(ii) 9: Density and design of houses and buildings</p> <p>Consider climate change in the density and design of houses and buildings, including public sector buildings. For example, make use of thermal properties of materials to improve cooling and reduce solar heating using recessed windows, roof overhangs and shades).</p> <p>Promote through policies in DPDs, SPDs (area and topic based) and planning conditions and obligations as well as through planning advice and encouragement (e.g. guidance or informatives).</p>	Developers and their advisers (e.g. architects, surveyors and engineers), Local planning authorities, local authorities Local planning authorities
<p>Action A(ii) 10: Retrofitting existing buildings</p> <p>Consider need to retrofit existing buildings, including residential and commercial properties and public buildings, to make them more resilient to the impacts of climatic changes e.g. flood risk. Adaptation measures should be incorporated as part of refurbishment and repair works.</p>	Property owners
<p>Action A(ii) 11: Resilience of infrastructure</p> <p>Consider need to make infrastructure, including transport, telecommunications, power, utilities etc, more resilient to the effects of climatic change, including storm events, landslides, subsidence, flooding and temperature.</p>	Local highway authorities, Highways Agency, rail companies, local authorities, water companies, telecom companies, electricity and gas companies

¹⁰⁵ See Regional Assembly and Environment Agency practitioners guide for further details (para 7.16 – 7.20).

Adaptation: (iii) Incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock

What is the issue?

Sustainable drainage measures

Ensuring development does not exacerbate flooding in its surroundings is an important consideration, especially given the level of development proposed in the South East. Development may reduce infiltration of water into the ground and increase surface runoff. Climate change has the potential to increase flood risk further due to more intense rainfall expected.

Sustainable Urban Drainage Systems (SUDS) offer an alternative to traditional approaches to managing runoff from buildings and hardstanding. SUDS can attenuate surface water runoff, recharge groundwater, protect water quality and provide an amenity and wildlife enhancement. Techniques include incorporation of water retention and storage structures into new development schemes, use of permeable surfaces and green roofs.

Water efficiency

Water is a precious resource and due to climate change, the supply of water is likely to decrease as rainfall becomes more seasonal, while the demand increases due to hotter summers, population and household growth and increased levels of consumer durables. Given this context and the existing sensitivity of the balance of water supply to demand in parts of the South East¹⁰⁶, the water efficiency of both the new and existing housing stock needs to be improved to reduce water use.

Buildings and landscaping are major water consumers and designs need to incorporate best practice standards to reduce water use and avoid wastage. This includes appropriate specification of water saving fixtures and fittings, utilisation of alternative water sources where possible¹⁰⁷, changing the behaviour of inhabitants¹⁰⁸ and designing low water use landscaping and gardens.

How is the issue being addressed?

Some of the key existing activities and actions to ensure sustainable drainage measures and high standards of water efficiency are incorporated in new and existing building stock are summarised below.

Example 10: Use of Sustainable Urban Drainage Systems (SUDS) at two motorway service stations

A range of SUDS techniques have been incorporated at the Hopwood Motorway Station Service Area on the M42 near Bromsgrove, Warwickshire and the Oxford Motorway Service Station on the M40 at Wheatley, Oxfordshire. Both of these sites provide examples of effectively managing the flow and quality of run-off prior to release into the local watercourse.

At Wheatley, infiltration was not used in the car park due to the risk of mobilising contaminants in the underlying soil. Permeable paving was used to manage the quality and attenuation of the run-off. At Hopwood, a suite of SUDS are used to collect, clean and store run-off, before discharging to the Hopwood Stream.

As well as helping to reduce flooding, SUDS have an amenity value and can provide wetlands or be incorporated into attractive water features.

Source: www.southeast-ra.gov.uk > our work > regional planning > environment and waste > toolkit appendix 7 (case studies)
www.environment-agency.gov.uk > Common Data > Figures > M40 services, Wheatley

¹⁰⁶ see adaptation principle i

¹⁰⁷ alternative water sources may include rainwater harvesting techniques and grey water recycling systems

¹⁰⁸ see generic cross-cutting responses

Research and information

The most relevant information on SUDS is from the National SUDS Working Group who have produced an interim code of practice¹⁰⁹. Local Planning Authorities such as Woking Borough Council have produced guidance on sustainable drainage systems¹¹⁰ and the Environment Agency has a web page dedicated to SUDS¹¹¹.

Green roofs are an important SUDS technique. A group of industry experts concluded that green roofs are best able to cope with the expected impacts of climate change¹¹². Further information can be found via the joint British Council for Offices and Corporation of London Green Roofs Research Advice Note¹¹³, which includes an introduction to the concept of the green roof as well as further technical information.

Assistance is available for industry on water efficiency initiatives, including developing water saving measures in manufacturing processes. Initiatives include Envirowise, which gives free advice and guidance on water efficiency for businesses¹¹⁴.

The water industry through UKWIR has commissioned a number of pieces of further work including working with the latest UKCIP scenarios, effect on groundwater levels and the sociology of water use which may provide insights on how to bring about behavioural change¹¹⁵.

Awareness raising and building partnerships

The Hampshire Water Partnership, in addition to raising awareness activities, is actively looking at how water efficiency and conservation can be tackled through specific areas such as local development documents¹¹⁶.

Developing policy and strategy

The draft South East Plan is addressing the need to incorporate sustainable drainage measures and high standards of water efficiency in new and existing building stock through several policies, including:

Policy NRM1 Sustainable water resources, groundwater and river water quality management which sets the context for preparing LDDs and determining planning applications and includes the requirement to achieve high levels of water efficiency.

Example 11: Greenfields housing development, Maidenhead, Berkshire

The Greenfields scheme is an affordable housing development in Maidenhead. Reducing natural resource use and energy consumption in the construction process and for daily living were key criteria in the scheme's development. The houses will use up to 50 per cent less energy and 30 per cent less water than conventional houses.

Water efficiency is improved by measures such as incorporating green roofs, collecting surface water run-off, using water saving appliances and recycling 'grey water' from baths, showers and wash basins for flushing toilets. It is hoped that the success of these innovative techniques will stimulate other developers to follow this example.

Source: www.southeast-ra.gov.uk > our work > regional planning > environment and waste > toolkit appendix 7 (case studies)

¹⁰⁹ *Interim Code of Practice for SUDS*, National SUDS Working Group 2004, www.environment-agency.gov.uk > business and industry > business sectors > construction > information for developers > SUDS – an introduction > SUDS - stakeholders > SUDS - National Working Group

¹¹⁰ *Sustainable Drainage Systems*, Woking Borough Council, www.woking.gov.uk > A-Z of council services > planning > publications available from planning services > Design Guide 4: Sustainable Drainage (SUDS)

¹¹¹ www.environment-agency.gov.uk > business and industry > business sectors > construction > information for developers > Sustainable Urban Drainage Systems (SUDS) – an introduction

¹¹² *BRE Digest 468 Reducing the Effects of Climate Change by Roof Design*, BRE, <http://www.brebookshop.com>

¹¹³ *Green Roofs Research Advice Note*, British Council for Offices and Corporation of London, www.cityoflondon.gov.uk > our services > development and planning > planning > publications > planning policy

¹¹⁴ www.envirowise.co.uk

¹¹⁵ www.ukwir.org

¹¹⁶ www.hampshireswater.org.uk

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Policy NRM3 *Sustainable flood risk management* which sets the context for preparing LDDs and determining planning applications in relation to PPG25 and flood risk, including the incorporation and management of SUDS. Box NMR1 includes details of possible sustainable drainage systems.

ODPM has published a consultation paper on a Code for Sustainable Homes (consultation on which closed on 6 March 2006)¹¹⁷ and are revising Part G of the Building Regulations to incorporate water efficiency measures into new development¹¹⁸.

Three Regions Climate Change Group has produced a checklist for development which includes consideration of drainage and water efficiency issues¹¹⁹.

What barriers need to be overcome?

Key barriers to incorporating sustainable drainage measures and high standards of water efficiency in new and existing building stock include:

- The perception and actual additional costs required to improve water efficiency and develop and maintain SUDS.
- Difficulties in changing individuals' behaviour to improve water efficiency.
- Concerns over responsibility for the future management, maintenance and replacement of SUDS.
- Short term decisions made based on capital costs of new or refurbished buildings rather than longer term operational costs.
- Lack of firm policy / legal compulsion on developers and home owners to adopt good practice.
- Lack of enforcement of the existing minimum standards and quality of construction work.
- Lack of some of the necessary skills and knowledge in the construction sector.

What are the priorities for action and who are the key players?

Table 10: Priority actions for sustainable drainage and water efficiency

Priorities for actions	Key players
Sustainable drainage	
Action A(iii) 1: Sustainable Urban Drainage in DPDs and SPDs Promote Sustainable Urban Drainage (SUDS) in DPD policies and topic based SPDs within all South East planning authorities (this could be within broader SPDs on sustainable construction and design – see cross cutting actions – or a specific SPD on	Local planning authorities

¹¹⁷ www.odpm.gov.uk > consultation papers > archived

¹¹⁸ www.odpm.gov.uk > building regulations

¹¹⁹ *Adapting to Climate Change: A Checklist for Development. Guidance on designing developments in a changing climate*, Three Regions Climate Change Group comprising Sustainable Development Roundtable for the East of England, London Climate Change Partnership and the South East Climate Change Partnership. Greater London Authority. 2005. www.london.gov.uk > mayor of london > sustainability > london climate change

¹²⁰ A model SPD and examples good practice are included in Box 7.6, 7.7 and 7.8 of the Regional Assembly and Environment Agency practitioners guide.

Priorities for actions	Key players
<p>SUDS or flood risk management)¹²⁰). SUDS benefit flood risk management and water quality.</p> <p>See the model structure for SPD on / including SUDS¹²¹ which includes:</p> <ul style="list-style-type: none"> • The potential problems caused by surface water runoff • The aims of the SUDS approach to drainage • The benefits of SUDS • The planning policy context • Sustainable drainage techniques • SUDS and the planning process • Adoption and maintenance • Choosing the right combination of SUDS techniques • Local soil permeability and hydrology characteristics • Other relevant source documents 	
<p>Action A(iii) 2: Adoption and maintenance of SUDS</p> <p>Use planning conditions and obligations to secure the management of sustainable drainage measures in new development¹²². See the Interim Code of Practice for Sustainable Drainage Systems which provides guidance on the circumstances when a Section 106 agreement or a planning condition may be appropriate¹²³.</p> <p>Where a development has been specifically laid out and designed on climate change principles, use planning obligations to secure the long-term maintenance of those features of the development that, if lost, would risk the undermining of the design principles of the development as a whole.</p> <p>Ensure the ongoing maintenance of SUDS by getting them adopted by local authorities, highways authorities or sewerage undertakers. See the Regional Assembly and Environment Agency practitioners guide and the Code of Practice for further details on funding mechanisms and model agreements for the three types of adopting organisations¹²⁴.</p>	<p>Local planning authorities</p> <p>Developers and their advisers (e.g. architects, surveyors and engineers), local authorities, highway authorities and sewerage undertakers</p>
<p>Action A(iii) 3: Use of informative to raise awareness of sustainable drainage</p> <p>Raise developers awareness of certain matters, such as suggesting the use of water conservation measures in new developments if not addressed as part of the scheme details (e.g. for a small housing scheme.), signposting to information e.g. on SUDS and reminders that Environment Agency consent is required for certain actions, Local Planning Authorities should use informatives attached to consents.</p>	<p>Local planning authorities</p>
<p>Action A(iii) 4: Incorporating SUDS into developments</p> <p>Developers and designers follow lead of policy and guidance and incorporate SUDS into new development, as appropriate, as part of good practice¹²⁵.</p>	<p>Developers and their advisers (e.g. architects, surveyors and engineers)</p>
<p>Water efficiency</p>	
<p>Action A(iii) 5: Water efficiency in DPDs and SPDs</p> <p>Incorporate relevant policies on water efficiency in core strategy DPDs as well as within generic development control policies within all South East planning authorities to maximise</p>	<p>Local planning authorities</p>

¹²¹ Source of model structure: para. 3.6, Interim Code of Practice for Sustainable Drainage Systems, National SUDS Working Group, ODPM, DEFRA & Welsh Assembly. July 2004.

¹²² See Box 7.9 and paras 7.23 – 7.34 of the Regional Assembly and Environment Agency practitioners guide for further details.

¹²³ Interim Code of Practice for Sustainable Drainage Systems, National SUDS Working Group, ODPM, DEFRA & Welsh Assembly. July 2004.

¹²⁴ For further information on use of the model agreements see the *Interim Code of Practice* and CIRIA publication C625 *Model agreements for sustainable water management systems: Model agreements for SUDS*. The agreements can be found at CIRIA's SUDS website (www.ciria.org/suds > [research and publications](#)) and in the CIRIA document.

¹²⁵ See Box NRM1 in the draft South East Plan for details on some of the systems

¹²⁶ A model DPD policy and an example good practice are included in Box 6.4, 6.5, 6.6 and 6.7 of the Regional Assembly and Environment Agency practitioners guide.

Adaptation: (iv) Increasing flood storage capacity and developing sustainable new water resources

What is the issue?

Flood storage capacity

Given the long term climatic changes predicted, sufficient flood storage is needed to adapt to future climatic conditions. Increased water storage capacity in flood plains would help to reduce flood risk up or downstream and could also have landscape and wildlife benefits (see Adaptation principles i, ii and v). This could be achieved by managing flooding through, for example, realignment of defences, removal of drainage, washlands and flood detention reservoirs. A further option is to increase water storage in the wider catchment. This can be achieved through soil and agricultural management and land use change, for example by increasing vegetative cover or improving soil infiltration. In urban areas increased storage may be achieved using SUDS (see *Adaptation principle iii*).

Water storage, and flood risk management more widely, needs to be built into spatial plans. This can be achieved by improving water retention within developments and increasing water storage, so that increased area of impermeable surfaces is offset, and safeguarding of land in spatial plans specifically for water storage.

New water resources

As stated in the draft South East Plan, the South East is one of the driest parts of the country and experiences high levels of water demand which is increasing due to new development and lifestyle changes, exacerbated by changes to the climate and rainfall patterns. In some areas the existing balance of supply to demand is very sensitive, with demand close to exceeding currently available sustainable supply. The ecological quality of some streams, rivers and wetlands is being adversely affected as a result, due to the level of abstraction and / or the reduced dilution of treated effluent. This has implications for meeting the requirements of the European Water Framework Directive and Habitats Directive.

The South East Plan outlines the need for a twin-track approach to water management, whereby firstly demand management needs to be increased (including increased water efficiency – see *Adaptation principle iii*, leakage management and the increased use of metering). Secondly sustainable new water resources and wastewater treatment infrastructure need to be planned and provided in step with the development they serve (see *Adaptation principle i*). New development must also have substantially increased levels of water efficiency (see *Adaptation principle iii*).

New water resources are therefore part of a wider strategy to plan for future water needs. However, due to the complexities of planning these new resources such as new reservoirs, involving a large number of landowners, local authorities, agencies and developers, the lead times can be substantial. Early engagement of local authorities, the Environment Agency, Office of Water Services (OFWAT), developers and water companies in the planning process is therefore imperative.

How is the issue being addressed?

Some of the key existing activities and actions to increase flood storage capacity and develop sustainable new water resources are summarised below.

Research and information

The Environment Agency and water companies in the South East have developed a series of scenarios, presented in maps and spreadsheets, to illustrate the effect on the water- demand balance of different levels of growth, improvements in water efficiency, and development of new resources. Further modelling by the Water Resources South East Group, lead by the Environment Agency, is being undertaken to model the distribution as well as scale proposed in the Draft South East Plan.

Developing policy and strategy

The draft South East Plan is addressing the need to increase of flood storage capacity and develop sustainable new water resources through several policies, including:

Policy NRM2 *Strategic Water resource Development* which sets out the need for new water resource schemes and the context for preparing LDDs and determining planning applications in relation these schemes. Strategic new water resource options that may be required to be operational over the Plan period include:

- Upper Thames reservoir by 2019/20
- Enlargement of Bewl reservoir by 2014/15
- Broad Oak reservoir by 2019/20
- Clay Hill reservoir by 2014/15
- Havant Thicket reservoir by 2020/21

The Plan also states that other resource schemes together with bulk water transfers, effluent re-use and desalination may also be required.

Policy NRM3 *Sustainable flood risk management* which sets the context for preparing LDDs and determining planning applications in relation to PPG25 and flood risk, including the incorporation and management of SUDS and other flood retention and water storage measures.

Catchment Flood Management Plans (CFMPs) are a vehicle for assessing the sensitivity of catchments to flood risk as a result of different scenarios, including development, land use change and climate change. They will look at different policy options for flood risk management including strategic storage, local protection and, where appropriate, large-scale changes in land use or alternative development locations. Identifying environmental impact and enhancement opportunities will be an integral part of this process. (see Adaptation (v) for more details).

The ESPACE project has produced 'Guiding Models' for ways to implement water retention and storage measures in different situations¹²⁹.

Water companies are working on identifying and planning for smaller and major strategic schemes as part of long term water resource planning. Water companies submit plans to Ofwat and the Environment Agency every 5 years.

What barriers need to be overcome?

Key barriers to increasing flood storage capacity and developing sustainable new water resources include:

¹²⁹ . www.espace-project.org

- Lead times for new reservoirs are long as they need to go through planning, assessment, funding and construction phases before they become operational.
- Relatively short time horizons of many plans and strategies, which makes it difficult to accommodate the long term view needed for climate change adaptation and mitigation.
- Difficulties in safeguarding land for future options.
- Uncertainty about the nature, complexity and extent of climate change and its impacts making strategic planning difficult and used to justification for inaction.
- Funding mechanisms for major resource development.

What are the priorities for action and who are the key players?

Table 11: Priority actions for flood storage and new water resources

Priorities for actions	Key players
Flood storage	
Action A(iv) 1: Identification of flood risk areas in DPDs LPAs should, when developing DPD policies, identify areas of flood risk and designate flood washlands/storage areas. Such decisions should factor in possible future requirements for flood storage as climate change leads to increased flood intensities.	Local planning authorities
Action A(iv) 2: Securing compensatory flood storage through LDDs, planning conditions and obligations Compensatory flood storage should be required through DPD policies and SPDs, and influenced through Local Planning Authorities and Environment Agency input to scheme design. This can be legally secured through a condition, or a planning obligation may be required to control phasing / implementation. Use planning conditions and obligations to secure compensatory flood storage.	Local planning authorities, Environment Agency
Action A(iv) 3: Agricultural winter water storage reservoirs and farming practices in DPDs and SPDs Include policies in LDDs to encourage agricultural winter water storage reservoirs and other sustainable farming practices which reduce summer abstraction (and reduce diffuse pollution and runoff and increase flood storage capacity and benefit wildlife). Promote and develop on farm winter waterstorage.	Local planning authorities NFU and farmers
Action A(iv) 4: Rural land use and agricultural practices Use rural land use management and agri-environment practices to help deliver flood risk management by, for example, the creation of wetlands and washlands, river corridor widening and river restoration which are potential mechanisms for reducing flooding in the lower reaches of catchments.	Landowners, farmers, Defra, Environment Agency
Action A(iv) 5: Environmental Stewardship and flood risk management Include a greater emphasis on flood risk management within objectives of Environmental Stewardship	Defra
Action A(iv) 6: Flood storage capacity Have regard to specific flood storage options in CFMPs and include requirements to safeguard land, and therefore not shut off options, and incorporate flood storage requirements as part of developments within LDDs.	Local planning authorities, developers
Action A(iv) 7: Incentives to provide flood storage Review incentives to landowners to provide flood storage, including washlands, as part of a more sustainable and integrated approaches to flood management.	Defra, Environment Agency
New water resources	
Action A(iv) 8: Liaison on delivering new water resources Local authorities should work with the water companies and Environment Agency in assisting in the timely delivery of new water resources schemes.	Local planning authorities, Environment Agency, water companies
Action A(iii) 9: Protection of water resources in DPDs	Local planning authorities

Priorities for actions	Key players
<p>Given the regional importance of water resources, supply and quality, all Local Planning Authority's within the South East should include a strategic policy on this topic within their Core Strategies, as well as more detailed policy within their generic development control policies¹³⁰.</p>	
<p>Action A(iv) 10: Developing new sources of water supply Develop new sources of water supply, especially reservoirs. Continue to develop mechanisms for joint working between water companies, Environment Agency and local planning authorities in agreeing the need, location and timing for new strategic water resources, particularly reservoirs.</p>	<p>Water companies, Environment Agency, local planning authorities</p>
<p>Action A(iv) 11: Safeguarding land for reservoir development in DPDs Consider need to safeguard land identified for reservoir development from other uses in DPDs, through closer working relations between local planners and the water industry.</p>	<p>Local planning authorities, water companies, Environment Agency</p>
<p>Action A(iv) 12: Reducing energy demand for pumping water Reduce the demand for energy which could increase with the need for pumping water from winter storage and groundwater etc. Consider ways of reducing energy demand and potential increases with climatic changes and increasing use of renewable energy. Water companies should aim to ensure that new infrastructure is "carbon neutral".</p>	<p>Local planning authorities, water companies, Environment Agency</p>

¹³⁰ Model DPD policies and an example good practice are included in Box 6.3 of the Regional Assembly and Environment Agency practitioners guide.

Adaptation: (v) Ensuring that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed

What is the issue?

Sustainable flood management

The South East faces particular flood risk management challenges with an extensive area at risk of flooding, due to coastal, tidal, fluvial, groundwater and surface run-off flood risk. Climate change is likely to increase the probability of flooding due to sea level rise, increased storminess, rapid run-off and increased winter precipitation. It is therefore important not to foreclose potential options to manage this risk in the future. Approaches needed in the future are likely to include:

- locating and designing development to reduce flood risk and impact, to mitigate its effect on flooding, and make it more resilient to flooding while enabling safe access in times of flood;
- making more space for water through better management of land for water storage and flood protection;
- realignment and management of defences to reinstate natural floodplains.

In order to manage flood risk sustainability, effective plans and strategies need to be in place to provide broad policies and priorities for actions, against the background of increasing flood probability. In addition, appropriate tools need to be used to inform local decisions (such as Flood Risk Assessment). Catchment Flood Management Plans (CFMP) and Shoreline Management Plans (SMP) provide this strategic context taking a whole river catchment or coastal cell approach to flood risk management. These, and flood risk strategy plans and other delivery plans, need to be reflected in Local Development Documents and other plans (e.g. rural land management, land use and water management plans), in order that potential options are not compromised.

Migration of habitats and species

As described in the draft South East Plan, the region has in excess of 700 land based and in-river SSSIs, many of which are also recognised as being of international importance and afforded protection under the EC Birds and Habitats Directives and the Ramsar Convention. It also states that a high quality environment, including rich and varied wildlife, is essential to the prosperity of the region and the quality of life of those who live and work in it.

However, there have been major losses of habitats and species populations in the region over recent decades and it is therefore essential that these important assets are protected and those that are in poor ecological condition are enhanced. The impacts of climate change will result in both further threats and opportunities. Many species and their habitats will need to be able to move if they are to survive and therefore need robust and well connected wildlife habitats. Further fragmentation of habitats will limit even more the ability of species to move and respond to the impacts of climate change.

How is the issue being addressed?

Some of the key existing activities and actions to ensure that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed are summarised below.

Research and information

Considerable research into sustainable flood management exists or is underway. For example, the Adaptation Strategies for Climate Change in the Urban Environment (ASCCUE) project concerns the vulnerability of towns and cities to climate change, and the development of adaptation strategies. The research includes a case study of Lewes, East Sussex, an extreme case in terms of vulnerability, where sea level rise interacts with enhanced river flows to produce severe and repeated flooding, but is not untypical of many south coast towns. Here, where adaptation is urgently needed but may be difficult to achieve in practice, the research will broadly identify the scale of the threat and explore potential solutions¹³¹.

Key information for future flood management is the Flood Zone maps (See Map NRM 2 in the draft South East Plan) published by the Environment Agency's which illustrate the zones of fluvial and tidal flooding probability.

Research and information relevant to the migration of habitats and species includes:

- Modelling the potential for habitat creation and species movement within areas of strategic opportunity and testing these results with stakeholders as part of the Kent Country Council and English Nature Lifescapes initiative¹³².
- RSPB in partnership with the Environment Agency have produced a map of areas in the Agency's Southern Region where there is potential for freshwater wetland creation. These maps are now being refined and will feed into the CFMP process.
- The South East of England Biodiversity Forum has developed a map showing areas of strategic opportunity for biodiversity improvement which has been included in the draft South East Plan. These areas identify the most strategic opportunities for restoring, recreating or creating biodiversity habitat in the South East and for delivering the regional biodiversity targets. The following key habitat types are mapped: wetlands, lowland heathland and acid grassland, woodland and calcareous grassland.
- As part of BRANCH (Biodiversity Requires Adaptations in North West Europe under a CHanging Climate) partners Environment Agency, Hampshire County Council and Tyndall Centre are using case studies in Hampshire to predict changes in coastal habitats under a range of different climate change scenarios. The information will be used to develop management and planning options through visualisation and work with stakeholders which will ultimately provide a tool for decision making¹³³.
- Over the next two years also as part of BRANCH, English Nature intends to roll out a training package on biodiversity and climate change for stakeholders, focussing on planners.

Awareness raising and building partnerships

English Nature (South East region) is leading the BRANCH (Programme which is a three year multi-partner project bringing together scientists, wildlife experts and planners to consider how spatial planning can enable wildlife to adapt to climate change.

¹³¹ www.art.man.ac.uk > research centres > CURE research centre > research projects

¹³² www.kent.gov.uk > environment > Kent landscape information system

¹³³ www.branchproject.org

Developing policy and strategy

The draft South East Plan is addressing the need to ensure that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed through several policies, including:

Policy NRM3 on flood risk management in the draft South East Plan will help implement CC2 part v. It encourages the application of the sequential test in PPG25 and the use of Strategic Flood Risk Assessments (SFRA) to provide a comprehensive understanding of flood risk and the options for managing that risk. It requires that new development does not compromise the future realignment of flood defences and that LDDs take account of flood management plans and that locally specific flood risk and land management options are safeguarded.

Policy NMR4 on the conservation and improvement of biodiversity in the draft South East Plan will also help implement CC2 part v. It encourages opportunities for biodiversity improvement, including large-scale habitat restoration, enhancement and re-creation in the areas of strategic opportunity for biodiversity improvement to be pursued.

Other activities relevant to sustainable flood management include:

- River Basin Management Plans (RBMPs) for the river basins in the South East (i.e. the Thames and the South East) which are being prepared (2004-2009) and the programmes of measures from the RBMPs for the river basins in the South East will be subsequently implemented (2009 onwards). The Environment Agency is currently investigating the links between RBMPs and climate change.
- Catchment Flood Management Plans (CFMPs) for all the catchments in the region which are being produced and implemented by the Environment Agency to promote sustainable flood risk management.
- A flood risk strategy for the Thames Estuary, Thames Estuary 2100, which is being developed by the Environment Agency. This includes north Kent within the South East Region and aims to determine the appropriate level of flood protection needed for London and the Thames Estuary for the next 100 years. This will take account of the implications of climate change.

Other activities relevant to migration of habitats and species include:

- English Nature is funding the Environmental Change Institute to produce regional statements about the likely impacts of climate change on biodiversity and of the policy implications of such impacts.
- The Wildlife Trusts' activities to make a contributions to climate change adaptation, including: the prevention of further habitat fragmentation; the establishment of policies to support large areas and networks (for example, through the South East Plan); the acquisition and management of nature reserves, and the development of large or networked sites; working with farmers to improve agricultural habitats and increase the permeability of the landscape to wild species;

Example 12: Willingdon Levels Flood Storage Compensation Scheme, Eastbourne, East Sussex

The Willingdon Levels Flood Storage Compensatory Scheme was developed by Eastbourne Borough Council, East Sussex. The Scheme provides an example of a strategic approach to secure mitigation of loss of flood storage caused by development.

Before planning permission was granted to developers, they had to assess the flood water storage which would be displaced as a result of their development. Developers were then obliged to make a financial contribution to the development of compensatory lakes at Eastbourne Park or provide compensatory storage themselves as part of their development.

This scheme has been in place since the early 1990s and, despite 70 hectares of development, the scheme has successfully prevented any flooding of properties in the catchment area.

Source: www.southeast-ra.gov.uk > our work > regional planning > environment and waste > toolkit appendix 7 (case studies)

- The RSPB has a programme of healthland restoration on its sites. This is not specifically to join up fragmented sites but to aim to increase the size of sites so they are more resilient.
- English Nature and Oxford University's Environmental Change Institute are leading a multi-partner project to predict how species and habitats in Britain and Ireland might be affected by climate change over the next 50 years. The project (MONARCH: Modelling Natural Resource Responses to Climate Change) is developing computer models to identify new areas to which species may have to move as climate changes. It also considers the biological and other constraints that might limit their ability to disperse. The results of this work are designed to inform the development of land-use policies and conservation management practices to help accommodate the movement of species through landscapes as they track climate change¹³⁴.
- An important element of BRANCH is to assess the effectiveness of existing spatial planning to allow biodiversity to adapt to climate change and provide recommendations for future policies.

What barriers need to be overcome?

Key barriers to ensuring that opportunities and options for sustainable flood management and migration of habitats and species are not foreclosed include:

- Relatively short time horizons of many plans and strategies, which makes it difficult to accommodate the long term view needed for climate change adaptation and mitigation.
- Financial cost of purchasing land and safeguarding areas to future options are not foreclosed (both in terms flood risk management and habitat migration).
- Uncertainty about the nature, complexity and extent of climate change and its impacts (on habitats for example) making strategic planning difficult and used to justification for inaction.
- Lack of joined up policy within and between different levels of decision-making (e.g. national, regional and local) and between different sectors acting as a barrier to planning for sustainable flood management and migration of habitats.

What are the priorities for action and who are the key players?

Table 12: Priority actions for flood management and migration of habitats and species

Priorities for actions	Key players
Flood management	
Action A(v) 1: Undertaking Strategic Flood Risk Assessments Undertake an appropriate Strategic Flood Risk Assessment (SFRA) for developments or plan allocations in flood zones 2 and 3. The SFRA should take account of potential changes in climate and avoid foreclosing options for realignment and management of defences to reinstate natural floodplains.	Developers and their advisers (e.g. architects, surveyors and engineers), Local planning authorities, Environment Agency
Action A(v) 2: Contributions to Strategic Flood Risk Assessments Use planning conditions and obligations to secure developer contributions to Strategic Flood Risk Management.	Developers and their advisers (e.g. architects, surveyors and engineers), local planning authorities, Environment Agency
Action A(v) 3: Developer contributions to strategic flood risk management Developers of a site contribute towards a planned flood alleviation scheme where it is part of the long-term plan for strategic flood risk management of an area, rather than provide site specific mitigation measures (this can be controlled through a planning obligation agreement).	Developers and their advisers (e.g. architects, surveyors and engineers), local planning authorities, Environment Agency

¹³⁴ www.ukcip.org.uk > resources > activity > biodiversity > projects

Priorities for actions	Key players
<p>Action A(v) 4: Flood risk and development briefs / area based SPDs</p> <p>When preparing a development brief or area based SPD for a particular area or site, consider the applicability of the range of measures identified in the adaptation options menu in the Regional Assembly and Environment Agency practitioners guide ¹³⁵.</p>	<p>Developers and their advisers (e.g. architects, surveyors and engineers), local planning authorities, Environment Agency</p>
<p>Action A(v) 5: Reflecting CFMPs in LDD</p> <p>Reflect CFMP policies and objectives within requirements in DPD policies, SPDs (area and topic based) and planning conditions and obligations, as well as through planning advice and encouragement (e.g. guidance or informatives).</p>	<p>Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers), Environment Agency</p>
<p>Action A(v) 6: Use planning requirements to develop improved flood defences</p> <p>Develop temporary 'islands', local ponding and flood storage in the urban environment as part of local / community flood protection through requirements in DPD policies, SPDs (area and topic based) and planning conditions and obligations, as well as through planning advice and encouragement (e.g. guidance or informatives)</p>	<p>Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers), Environment Agency, local communities</p>
<p>Action A(v) 7: Flood risk management and farming / forestry land management</p> <p>Encouraging positive flood risk management by changing farming and forestry land management practices. This is especially important where it would directly contribute to the delivery of CFMP objectives, enhance biodiversity and amenity, or mitigate the impact of urban development on the water environment.</p>	<p>Defra, Forestry Commission, Countryside Agency, English Nature, Wildlife Trusts, local planning authorities, Environment Agency, farmers, land managers</p>
<p>Action A(v) 8: River Basin Management Plans</p> <p>Develop and promote a whole of catchment approach to addressing climate change, through River Basin Management Plans to ensure that land management, forestry, agriculture, soil, communities, riparian issues, traditional river systems, wetlands etc are all considered in decision making relating to flood management.</p>	<p>Environment Agency, Defra, Forestry Commission, Countryside Agency, English Nature, Wildlife Trusts, local planning authorities, farmers, land managers</p>
<p>Action A(v) 9: Use of landscape features to absorb flood water</p> <p>Incorporate landscape features to absorb water within development. Promote these through requirements in DPD policies, SPDs (area and topic based) and planning conditions and obligations, as well as through planning advice and encouragement (e.g. guidance or informatives).</p>	<p>Local planning authorities, developers and their advisers (e.g. architects, surveyors and engineers), Environment Agency</p>
Migration of habitats and species	
<p>Action A(v) 10: Support wildlife corridors in LDDs</p> <p>Include policies to protect green corridors, wildlife corridors and green infrastructure in LDDs to facilitate habitat and species migration.</p> <p>Green grid strategies have been developed, for example, in the Thames Gateway and this concept could be promoted more widely and be developed further to incorporate future climatic change.</p>	<p>Local planning authorities, English Nature</p>
<p>Action A(v) 11: Research on the ability of species to track changes in their suitable climate space</p> <p>Undertake more research on the ability of species to track changes in their suitable climate space as an autonomous adaptation response. Modelling of the potential response of species and habitats to climate change should be continued and the effects of land cover change incorporated.</p>	<p>Defra, English Nature, universities</p>
<p>Action A(v) 12: Protection and enhancement of biodiversity in LDDs</p> <p>Increase the effectiveness of spatial planning to provide for the protection and enhancement of biodiversity in a changing climate. Local planning authorities should draw on the guidance to be provided by BRANCH in developing relevant policies on adaptive management in LDDs.</p>	<p>BRANCH, English Nature, Local planning authorities</p>

¹³⁵ See section 7 of the Regional Assembly and Environment Agency practitioners guide which includes a menu of adaptation options to respond to flood risk within specific developments.

Priorities for actions	Key players
<p>Action A(v) 13: Habitat creation as part of agri-environment initiatives</p> <p>Incorporate incentives for habitat creation adapted and resilient to climate change in agri-environment initiatives.</p>	Defra, Countryside Agency, English Nature, local biodiversity partnerships, Wildlife Trusts, farmers, land managers
<p>Action A(v) 14: Review of agri-environment schemes and BAP targets</p> <p>As part of the periodic reviews of agri-environment schemes and BAP targets (including those in Species, Habitat and Local Action Plans) incorporate the requirement to revise them in the light of climate change adaptation and which habitats will be / will not be appropriate to invest in the South East in the future.</p>	Defra, English Nature, local biodiversity groups, Wildlife Trusts, RSPB, farmers, agricultural advisers and representative groups, land managers
<p>Action A(v) 15: Translocation of threatened species</p> <p>Consider translocation of threatened species with introduction to more suitable locations as climate change intensifies.</p>	Wildlife Trusts, English Nature
<p>Action A(v) 16: Extent of managed nature reserves</p> <p>Increase the extent of managed nature reserves, particularly to establish large area sites and form functional ecological networks.</p>	Wildlife Trusts, English Nature, Local authorities, RSPB
<p>Action A(v) 17: Coppiced wood for bio-fuel</p> <p>Encourage the use of coppiced wood for bio-fuel where this helps secure benefits for biodiversity (for example, through longer rotation management) or supports appropriate management of wildlife habitats.</p>	Defra, Forestry Commission, NFU, farmers, landowners
<p>Action A(v) 18: Spread of intertidal and freshwater habitats further up river valleys</p> <p>Incorporate encouraging the spread of intertidal habitats and the provision of freshwater wetland creation further up river valleys through policies in River Basin Management Plans. Other plans and strategies, including biodiversity strategies (e.g. ChaMPs, BAPs, WLMPs), flood defence plans and strategies (e.g. SMPs, CFMPs) and spatial planning documents (e.g. LDDs) can also contribute.</p>	English Nature, local biodiversity partnerships, local authorities, Environment Agency, Local planning authorities, Wildlife Trusts, RSPB
<p>Action A(v) 19: Protect against fragmentation and sites acquisition to support biodiversity</p> <p>Protect against fragmentation and ensure space is available to allow species to move due to climate change. Purchase strategic sites to reduce fragmentation and support future biodiversity.</p>	English Nature, Wildlife Trusts, RSPB, local authorities
<p>Action A(v) 20: Habitat creation</p> <p>When habitat creation is incorporated as part of a partnership project or development proposal (utilising legal agreements, planning conditions, S106 funds, for example), consider opportunities to create habitat adapted and resilient to climate change.</p>	Local planning authorities, Developers and their advisers (e.g. architects, surveyors and engineers)
<p>Action A(v) 21: Suitability of woodland planting stock</p> <p>Consider planting stock used during restocking, restoration and woodland expansion to reflect anticipated changes in species suitability. Consider the principal purpose(s) of the woodland when assessing options for climate change adaptation (e.g. timber production, leisure and amenity, restoration / maintenance of semi-natural woodland and maintenance of native generic resource)</p>	Forestry Commission, landowners
<p>Action A(v) 22: Monitoring trees, woodlands and forests</p> <p>Monitor trees, woodlands and forests in the South East region to both assess impacts of climate change and monitor success of responses. Monitor the extent and scale of changes to trees, woodlands and forests to inform future management</p>	Forestry Commission, landowners
<p>Action A(v) 23: Management of green spaces for wildlife movement</p> <p>Manage green spaces to provide space for wildlife movement. Plan for wildlife corridors within public spaces to allow natural migration of species.</p>	Local authorities, land managers

Which actions need to be undertaken by which organisation?

- 4.8 The following tables (Tables 13 to 27) list the actions reorganised by the different organisations and stakeholders (see Section 3, Box 3). The timescale for the implementation of the action is also included (i.e. Now (2006-10) or later (2010+), note some are ongoing throughout), along with the types of action: plans and policies; operational; standards/regulations; research and monitoring; education; and partnerships. The numbering system used for the actions matches that used in the earlier part of Section 4 covering the five mitigation and five adaptation principles included under South East Plan Policy CC2, plus the cross-cutting actions. To see the full details on each action beyond just the title refer back to Tables 2 to 12.
- 4.9 The groupings of organisations and stakeholders included in the following tables are:
- National policy makers / central government (e.g. DEFRA, ODPM, DTI, HM Treasury, DfES, DoT) – Table 13
 - National regulators / advisors (e.g. Environment Agency, Countryside Agency, English Nature, Ofwat) – Table 14
 - Regional planners and policy makers (e.g. The Regional Assembly / GOSE / SEEDA) – Table 15
 - Other regional and national organisations and initiatives / partnerships (e.g. Energy Saving Trust, Carbon Trust, SECCP, SESEP, ESPACE) – Table 16
 - Local authorities – Table 17
 - Utilities and other service providers including the water industry, energy providers, telecommunications industry, transport service providers and authorities (e.g. rail operators, bus companies, infrastructure management - Network Rail, Highways Agency, sewage undertakers etc) – Table 18
 - Waste management and disposal industry – Table 19
 - Health service providers (e.g. Primary Care Trusts) – Table 20
 - Business and commerce including representative organisations (e.g. CBI, Chambers of Commerce etc) – Table 21
 - Insurance industry, construction, development and design industry (e.g. architects, landscape architects, engineers, builders, trade and professional bodies) – Table 22
 - Tourism and leisure industry – Table 23
 - Agricultural and forestry industry, landowners and land and heritage managers (e.g. NFU, farmers, Forestry Commission) – Table 24
 - Research and academic institutions / higher and further education – Table 25

- NGOS / voluntary organisations (e.g. Wildlife Trusts, National Trust) – Table 26
- Community groups and households / individuals (e.g. Local Strategic Partnerships) – Table 27

Table 13: Priority actions for national policy makers / central government

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C5:	Sustainability Appraisals and Strategic Environmental Assessments	ODPM	●	●
C7:	Climate proofing plans and strategies	All government departments	●	●
M(i) 3:	Strengthening and enforcing Building Regulations	ODPM, Defra	●	
M(i) 4:	Designing buildings to increase their thermal mass	ODPM	●	●
M(iv) 6:	Government support for small-scale renewables	DTI	●	
M(iv) 7:	Amend PPS2 to include requirement for LDDs to set renewable energy targets	ODPM	●	
M(iv) 10:	Supporting bio-fuels	Defra, DTI, DoT	●	●
A(iii) 8:	Demand management through water metering	Defra	●	
A(iv) 4:	Rural land use and agricultural practices	Defra	●	●
A(v) 8:	River Basin Management Plans	Defra	●	●
A(v) 13:	Habitat creation as part of agri-environment initiatives	Defra	●	
A(v) 14:	Review of agri-environment schemes and BAP targets	Defra	●	●
Operational				
M(v) 4:	Kerbside collection for biodegradable waste	DEFRA Waste Implementation Programme Local Authority Support Unit	●	●
A(i) 8:	Assessment of high risk locations	Defra	●	●
A(v) 7:	Flood risk management and farming / forestry land management	Defra	●	●
Standards / regulations				
M(i) 7:	Using Business Rates as an incentive for energy efficiency	ODPM	●	●
M(ii) 4:	Road charging	DoT		
M(ii) 9:	Financial incentives for low emission vehicles	DoT, Defra, HM Treasury	●	
M(iii) 6:	Land and forestry management for carbon capture	Defra	●	
M(iii) 8:	Carbon accounting	Defra	●	
M(v) 7:	Incentives to increase diversion of biodegradable waste from landfill	Defra, HM Treasury	●	
A(i) 11:	Linking water resources planning and wider development planning	ODPM, Defra	●	
A(i) 14:	Risk from subsidence	ODPM	●	
A(i) 15:	Managing and planning for subsidence	ODPM	●	
A(ii) 8:	Resilience of foundations	ODPM	●	
A(iii) 7:	Extend Building Regulations to facilitate water efficiency	ODPM	●	
A(iv) 5:	Environmental Stewardship and flood risk management	Defra	●	
A(iv) 7:	Incentives to provide flood storage	Defra	●	
A(v) 17:	Coppiced wood for bio-fuel	Defra	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Research & monitoring				
C12:	Climate change research	Defra	●	●
C14:	Inventory of greenhouse gas emissions	Defra	●	●
M(iii) 7:	Promoting wood products in construction	ODPM	●	●
A(v) 11:	Research on the ability of species to track changes in their suitable climate space	Defra	●	●
Education				
M(i) 11:	Information on how to be energy (and water) efficient	ODPM	●	●
M(iii) 9:	Advice to land managers	DTI	●	
M(iv) 9:	Promote biomass energy crops	Defra	●	●
M(v)6:	Home composting	DEFRA Waste Implementation Programme Local Authority Support Unit	●	
A(ii) 7:	Information on flood risk	ODPM	●	●

Table 14: Priority actions for national regulators / advisors

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C5:	Sustainability Appraisals and Strategic Environmental Assessments	Environment Agency	●	●
C7:	Climate proofing plans and strategies	Environment Agency, Countryside Agency, English Nature, English Heritage	●	●
M(iii) 3:	Integrating green space within communities	Countryside Agency, English Nature	●	●
M(iv) 6:	Government support for small-scale renewables	Ofgem	●	
A(i) 1:	Flood risk in DPDs and SPDs	Environment Agency	●	●
A(i) 4:	Strategic approach to flood risk management in DPDs	Environment Agency	●	●
A(i) 5:	Water resources and water quality in DPDs and SPDs	Environment Agency, Ofwat	●	●
A(i) 9:	Flood risk management plans and strategies	Environment Agency, English Nature	●	●
A(i) 12:	Outputs from BRANCH	English Nature (and BRANCH)	●	
A(iv) 2:	Securing compensatory flood storage through LDDs, planning conditions and obligations	Environment Agency	●	●
A(iv) 11:	Safeguarding land for reservoir development in DPDs	Environment Agency	●	●
A(v) 1:	Undertaking Strategic Flood Risk Assessments	Environment Agency	●	●
A(v) 2:	Contributions to Strategic Flood Risk Assessments	Environment Agency	●	●
A(v) 3:	Developer contributions to strategic flood risk management	Environment Agency	●	●
A(v) 4:	Flood risk and development briefs / area based SPDs	Environment Agency	●	●
A(v) 5:	Reflecting CFMPs in LDD	Environment Agency	●	●
A(v) 6:	Use planning requirements to develop improved flood defences	Environment Agency	●	●
A(v) 7:	Flood risk management and farming / forestry land management	Countryside Agency, English Nature,	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
		Environment Agency		
A(v) 8:	River Basin Management Plans	Environment Agency , Countryside Agency, English Nature	●	●
A(v) 9:	Use of landscape features to absorb flood water	Environment Agency	●	●
A(v) 10:	Support wildlife corridors in LDDs	English Nature	●	●
A(v) 12:	Protection and enhancement of biodiversity in LDDs	English Nature (and BRANCH)	●	●
A(v) 13:	Habitat creation as part of agri-environment initiatives	English Nature, Countryside Agency	●	
A(v) 14:	Review of agri-environment schemes and BAP targets	English Nature	●	●
A(v) 18:	Spread of intertidal and freshwater habitats further up river valleys	English Nature, Environment Agency	●	●
Operational				
M(iii) 5:	Community woodlands	Countryside Agency	●	●
M(iv) 11:	Forestry products for renewable power generation	Countryside Agency	●	●
A(i) 8:	Assessment of high risk locations	Environment Agency	●	●
A(ii) 1:	Flood Risk Assessments	Environment Agency	●	●
A(iii) 8:	Demand management through water metering	Ofwat, Environment Agency	●	●
A(iv) 4:	Rural land use and agricultural practices	Environment Agency	●	●
A(iv) 10:	Developing new sources of water supply	Environment Agency	●	●
A(iv) 12:	Reducing energy demand for pumping water	Environment Agency	●	●
A(v) 15:	Translocation of threatened species	English Nature	●	●
A(v) 16:	Extent of managed nature reserves	English Nature	●	●
A(v) 17:	Coppiced wood for bio-fuel	English Nature	●	●
A(v) 19:	Protect against fragmentation and sites acquisition to support biodiversity	English Nature	●	●
Standards / regulations				
A(i) 10:	Funding arrangements for water infrastructure	Ofwat, Environment Agency	●	
A(i) 11:	Linking water resources planning and wider development planning	Ofwat, Environment Agency	●	
A(iv) 7:	Incentives to provide flood storage	Environment Agency	●	
Research & monitoring				
C12:	Climate change research	Environment Agency, English Nature	●	●
M(v) 11:	Research on landfill performance	Environment Agency	●	●
A(v) 11:	Research on the ability of species to track changes in their suitable climate space	English Nature	●	●
Education				
A(ii) 7:	Information on flood risk	Environment Agency	●	●
Partnerships				
A(iv) 8:	Liaison on delivering new water resources	Environment Agency	●	●

Table 15: Priority actions for regional planners and policy makers

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C7:	Climate proofing plans and strategies	Regional Assembly, SEEDA	●	●
C8:	Code for Sustainable Homes	Regional Assembly, SEEDA	●	
C10:	Lobbying central Government on climate change	Regional Assembly, SEEDA	●	●
M(i) 6:	Lobby government for more incentives to promote energy efficiency	Regional Assembly, SEEDA	●	
M(ii) 6:	Targets for travel plans	Regional Assembly	●	●
M(ii) 10:	Lobby central government on transport	Regional Assembly	●	
M(iii) 3:	Integrating green space within communities	Regional Assembly, SEEDA	●	●
M(iv) 2:	Integrating CHP and mini / micro CHP in developments	SEEDA	●	●
M(iv) 3:	Implementation of South East Sustainable Energy Partnership Business Plan	Regional Assembly, SEEDA	●	
M(iv) 6:	Government support for small-scale renewables	Regional Assembly, SEEDA	●	
M(iv) 7:	Amend PPS2 to include requirement for LDDs to set renewable energy targets	Regional Assembly, SEEDA	●	
M(iv) 10:	Supporting bio-fuels	Regional Assembly, SEEDA	●	●
M(v) 1:	Allocation of waste sites in DPDs	GOSE	●	
Operational				
M(i) 8:	Support for businesses on energy efficiency through Envirowise	GOSE, SEEDA	●	
M(ii) 3:	Changing the way we travel	GOSE	●	●
M(ii) 4:	Road charging	GOSE, SEEDA, Regional Assembly	●	●
M(iv) 8:	Developing renewables supply chain	SEEDA	●	●
A(iii) 8:	Demand management through water metering	Regional Assembly	●	●
Standards / regulations				
M(iv) 5:	Review of regional renewable energy targets	Regional Assembly, SEEDA	●	
Research & monitoring				
C13:	Climate change indicators	Regional Assembly	●	●
C14:	Inventory of greenhouse gas emissions	Regional Assembly	●	●
Education				
M(i) 10:	Information on energy efficiency	SEEDA	●	●
M(i) 11:	Information on how to be energy (and water) efficient	Regional Assembly	●	●
M(i) 12:	Energy efficiency in existing buildings	SEEDA	●	●
Partnerships				
M(v) 9:	Increase resource efficiency	Regional Assembly	●	●

Table 16: Priority actions for other regional and national organisations and initiatives / partnerships

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C8:	Code for Sustainable Homes	SECCP	●	
C10:	Lobbying central Government on climate change	SECCP	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
M(i) 6:	Lobby government for more incentives to promote energy efficiency	National Energy Foundation	●	
M(iii) 3:	Integrating green space within communities	SERLAWN	●	●
M(iv) 2:	Integrating CHP and mini / micro CHP in developments	SESEP	●	●
M(iv) 3:	Implementation of South East Sustainable Energy Partnership Business Plan	SESEP	●	
M(iv) 7:	Amend PPS2 to include requirement for LDDs to set renewable energy targets	SESEP	●	
M(v) 1:	Allocation of waste sites in DPDs	South East Waste Advisory Group	●	
A(i) 13:	Outputs from ESPACE	ESPACE	●	
Operational				
M(i) 8:	Support for businesses on energy efficiency through Envirowise	Envirowise	●	
M(ii) 8:	Low emission fleet and freight vehicles	Energy Saving Trust	●	●
M(iii) 4:	Management of woodland to maximise carbon capture	SERLAWN	●	●
M(iii) 5:	Community woodlands	SERLAWN,	●	●
M(iv) 4:	Renewable energy capacity at public sector sites	SESEP	●	●
M(iv) 6:	Government support for small-scale renewables	SESEP	●	
M(iv) 8:	Developing renewables supply chain	BioRegional Wood fuel network, SESEP	●	●
A(i) 3:	Assessments of communications network and infrastructure	SECCP	●	●
Standards / regulations				
M(iv) 5:	Review of regional renewable energy targets	SESEP, SE Forum for Sustainability	●	
M(v) 7:	Incentives to increase diversion of biodegradable waste from landfill	WRAP, SESBP	●	
Research & monitoring				
C12:	Climate change research	members of SECCP	●	●
C13:	Climate change indicators	SECCP	●	●
C14:	Inventory of greenhouse gas emissions	SECCP	●	●
Education				
C11:	Raising awareness with local communities	SECCP	●	●
M(i) 10:	Information on energy efficiency	Energy Saving Trust, Carbon Trust	●	
M(i) 11:	Information on how to be energy (and water) efficient	Envirowise, SECCP	●	
M(i) 12:	Energy efficiency in existing buildings	Energy Saving Trust, Carbon Trust	●	●
M(iii) 7:	Promoting wood products in construction	BRE	●	●
M(iii) 9:	Advice to land managers	Carbon Trust	●	●
Partnerships				
M(v) 9:	Increase resource efficiency	Envirowise, WRAP	●	●

Table 17: Priority actions for local authorities

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C1:	Local Authority climate change strategies	Local authorities	●	

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
C2:	South East Plan policies in DPDs and SPDs	Local planning authorities	●	
C3:	SPDs on sustainable construction	Local planning authorities	●	
C5:	Sustainability Appraisals and Strategic Environmental Assessments	Local planning authorities, transport authorities	●	●
C6:	Development checklists	Local planning authorities	●	●
C7:	Climate proofing plans and strategies	Local authorities, Local planning authorities, transport authorities	●	●
C8:	Code for Sustainable Homes	Local authorities, Local planning authorities	●	
C9:	Nottingham Declaration on Climate Change	Local authorities	●	
C10:	Lobbying central Government on climate change	Local authorities	●	●
M(i) 1:	Energy efficiency targets in DPDs	Local planning authorities	●	●
M(i) 4:	Designing buildings to increase their thermal mass	Local planning authorities	●	●
M(ii) 1:	Sustainable transport in DPDs and SPDs	Local planning authorities, local transport authorities	●	●
M(ii) 2:	Phasing of public transport infrastructure	Local planning authorities, local transport authorities	●	●
M(ii) 5:	Preparation of travel plans	Local authorities, Local planning authorities	●	●
M(ii) 6:	Targets for travel plans	Local planning authorities	●	●
M(ii) 10:	Lobby central government on transport	Local transport authorities	●	
M(iii) 1:	Supporting the creation of woodland in DPDs	Local planning authorities	●	●
M(iii) 3:	Integrating green space within communities	Local planning authorities	●	●
M(iii) 5:	Community woodlands	Local planning authorities	●	●
M(iv) 1:	Renewable energy targets in DPDs and SPDs	Local planning authorities	●	●
M(iv) 2:	Integrating CHP and mini / micro CHP in developments	Local planning authorities	●	●
M(iv) 3:	Implementation of South East Sustainable Energy Partnership Business Plan	Local authorities	●	
M(v) 1:	Allocation of waste sites in DPDs	Local planning authorities, Waste planning authority	●	
M(v) 2:	Waste minimisation in LDDs	Local planning authorities, Waste planning authority	●	●
M(v) 3:	Energy from waste and anaerobic digestion in LDDs	Local planning authorities, Waste planning authority	●	●
A(i) 1:	Flood risk in DPDs and SPDs	Local planning authorities	●	●
A(i) 2:	Baseline for SEAs and SAs	Local planning authorities	●	●
A(i) 9:	Flood risk management plans and strategies	Local planning authorities	●	●
A(i) 12:	Outputs from BRANCH	Local planning authorities	●	

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
A(i) 13:	Outputs from ESPACE	Local planning authorities	●	
A(i) 15:	Managing and planning for subsidence	Local planning authorities	●	
A(ii) 6:	Flood protection in SPDs	Local planning authorities	●	●
A(ii) 9:	Density and design of houses and buildings	Local planning authorities, local authorities	●	●
A(iii) 1:	Sustainable Urban Drainage in DPDs and SPDs	Local planning authorities	●	●
A(iii) 5:	Water efficiency in DPDs and SPDs	Local planning authorities	●	●
A(iii) 6:	Use of planning conditions and obligations to secure water efficiency and conservation	Local planning authorities	●	●
A(iv) 1:	Identification of flood risk areas in DPDs	Local planning authorities	●	●
A(iv) 2:	Securing compensatory flood storage through LDDs, planning conditions and obligations	Local planning authorities	●	●
A(iv) 3:	Agricultural winter water storage reservoirs and farming practices in DPDs and SPDs	Local planning authorities	●	●
A(iv) 6:	Flood storage capacity	Local planning authorities	●	●
A(iii) 9:	Protection of water resources in DPDs	Local planning authorities	●	●
A(iv) 11:	Safeguarding land for reservoir development in DPDs	Local planning authorities	●	●
A(v) 1:	Undertaking Strategic flood risk Assessments	Local planning authorities	●	●
A(v) 2:	Contributions to Strategic Flood Risk Assessments	Local planning authorities	●	●
A(v) 3:	Developer contributions to strategic flood risk management	Local planning authorities	●	●
A(v) 4:	Flood risk and development briefs / area based SPDs	Local planning authorities	●	●
A(v) 5:	Reflecting CFMPs in LDD	Local planning authorities	●	●
A(v) 6:	Use planning requirements to develop improved flood defences	Local planning authorities	●	●
A(v) 7:	Flood risk management and farming / forestry land management	Local planning authorities	●	●
A(v) 8:	River Basin Management Plans	Local planning authorities	●	●
A(v) 9:	Use of landscape features to absorb flood water	Local planning authorities	●	●
A(v) 10:	Support wildlife corridors in LDDs	Local planning authorities	●	●
A(v) 12:	Protection and enhancement of biodiversity in LDDs	Local planning authorities	●	●
A(v) 18:	Spread of intertidal and freshwater habitats further up river valleys	Local planning authorities, local authorities	●	●
Operational				
M(i) 3:	Strengthening and enforcing Building Regulations	Local planning authorities, local authorities	●	●
M(i) 5:	Refurbishing publicly owned buildings	Local authorities, education authorities	●	●
M(ii) 3:	Changing the way we travel	Local planning authorities, local transport authorities, Local authorities	●	●
M(ii) 7:	Promoting flexible working practices	Local planning authorities, Local authorities	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
M(ii) 8:	Low emission fleet and freight vehicles	Fleet managers	●	●
M(iv) 4:	Renewable energy capacity at public sector sites	Local authorities, education authorities	●	●
M(v) 4:	Kerbside collection for biodegradable waste	Waste collection authorities, Waste disposal authorities	●	●
M(v) 5:	Organisation of civic amenity sites to facilitate re-use and recycling	Waste collection authorities, Waste disposal authorities	●	
M(v) 10:	Waste contracts	Waste collection authorities, Waste disposal authorities	●	●
A(i) 3:	Assessments of communications network and infrastructure	Highways Authorities, Local planning authorities	●	●
A(i) 3:	Assessments of communications network and infrastructure	Highways Authorities, Local planning authorities	●	●
A(i) 4:	Strategic approach to flood risk management in DPDs	Local planning authorities	●	●
A(i) 5:	Water resources and water quality in DPDs and SPDs	Local planning authorities	●	●
A(i) 6:	Flood risk and development sites	Local planning authorities	●	●
A(i) 7:	Flood risk assessments	Local planning authorities	●	●
A(i) 8:	Assessment of high risk locations	Local planning authorities	●	●
A(ii) 1:	Flood Risk Assessments	Local planning authorities	●	●
A(ii) 4:	Use of planning conditions and obligations to increase resilience to flooding	Local planning authorities	●	●
A(ii) 11:	Resilience of infrastructure	Local highway authorities	●	●
A(iii) 2:	Adoption and maintenance of SUDS	Local planning authorities, local authorities, highway authorities	●	●
A(iii) 8:	Demand management through water metering	Local planning authorities	●	●
A(iv) 10:	Developing new sources of water supply	Local planning authorities	●	●
A(iv) 12:	Reducing energy demand for pumping water	Local planning authorities	●	●
A(v) 16:	Extent of managed nature reserves	Local authorities	●	●
A(v) 19:	Protect against fragmentation and sites acquisition to support biodiversity	Local authorities	●	●
A(v) 20:	Habitat creation	Local planning authorities	●	●
A(v) 23:	Management of green spaces for wildlife movement	Local authorities	●	●
Standards / regulations				
M(i) 7:	Using Business Rates as an incentive for energy efficiency	Local authorities	●	
M(ii) 4:	Road charging	Local highway authorities	●	●
A(i) 11:	Linking water resources planning and wider development planning	Local planning authorities	●	
A(i) 14:	Risk from subsidence	Local planning authorities	●	
A(ii) 8:	Resilience of foundations	Local planning authorities	●	

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Research & monitoring				
M(ii) 11:	Monitoring success of urban concentration policies	Local transport authorities, local planning authorities	●	●
M(v) 11:	Research on landfill performance	Waste collection authorities, Waste disposal authorities	●	●
Education				
C11:	Raising awareness with local communities	Local authorities	●	●
M(i) 10:	Information on energy efficiency	Local authorities	●	●
M(i) 11:	Information on how to be energy (and water) efficient	Local authorities	●	●
M(i) 12:	Energy efficiency in existing buildings	Local planning authorities	●	●
M(iii) 7:	Promoting wood products in construction	Local planning authorities	●	●
M(v) 6:	Home composting	Waste collection authorities, Waste disposal authorities	●	
A(ii) 5:	Use of informative to raise awareness of flooding issues	Local planning authorities	●	●
A(iii) 3:	Use of informative to raise awareness of sustainable drainage	Local planning authorities	●	●
Partnerships				
M(v) 9:	Increase resource efficiency	Local authorities	●	●
A(iv) 8:	Liaison on delivering new water resources	Local planning authorities	●	●

Table 18: Priority actions for utilities and other service providers including the water industry, energy providers, telecommunications industry, transport service providers and authorities

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C5:	Sustainability Appraisals and Strategic Environmental Assessments	Water companies	●	●
C7:	Climate proofing plans and strategies	Water companies, telecommunication companies; transport service providers	●	●
M(iv) 3:	Implementation of South East Sustainable Energy Partnership Business Plan	TV Energy	●	
A(i) 1:	Flood risk in DPDs and SPDs	Water companies	●	●
A(i) 5:	Water resources and water quality in DPDs and SPDs	Water companies	●	●
A(iv) 11:	Safeguarding land for reservoir development in DPDs	Water companies	●	●
Operational				
A(i) 3:	Assessments of communications network and infrastructure	Energy providers, telecoms industry, highways authorities, Network Rail, Highways Agency	●	●
A(ii) 11:	Resilience of infrastructure	Highways Agency, rail companies, local authorities, water companies,	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
		telecom companies, electricity and gas companies		
A(iii) 2:	Adoption and maintenance of SUDS	Sewerage undertakers	●	●
Action A(iii) 8:	Demand management through water metering	Water companies	●	●
A(iv) 10:	Developing new sources of water supply	Water companies	●	●
A(iv) 12:	Reducing energy demand for pumping water	Water companies	●	●
Standards / regulations				
A(i) 10:	Funding arrangements for water infrastructure	Water companies	●	
A(i) 11:	Linking water resources planning and wider development planning	Water companies	●	
Research & monitoring				
C12:	Climate change research	Water companies (and their representative bodies)	●	●
Education				
C11:	Raising awareness with local communities	Water companies, energy providers	●	●
M(i) 10:	Information on energy efficiency	TV Energy	●	●
M(i) 12:	Energy efficiency in existing buildings	TV Energy	●	●
Partnerships				
A(iv) 8:	Liaison on delivering new water resources	Water companies	●	●

Table 19: Priority actions for waste management and disposal industry

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C7:	Climate proofing plans and strategies	Waste management and disposal industry	●	●
Operational				
M(v) 4:	Kerbside collection for biodegradable waste	Waste management companies	●	●
M(v) 8:	Investment in energy recovery	Waste management industry	●	●
Research & monitoring				
M(v) 11:	Research on landfill performance	Waste management companies / landfill operators	●	●

Table 20: Priority actions for health service providers

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C7:	Climate proofing plans and strategies	Primary Care Trusts	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Operational				
M(i) 5:	Refurbishing publicly owned buildings	Hospital trusts	●	●
M(iv) 4:	Renewable energy capacity at public sector sites	Primary Care Trusts	●	●

Table 21: Priority actions for business and commerce including representative organisations

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C1:	Local Authority climate change strategies	Businesses	●	
M(ii) 5:	Preparation of travel plans	Businesses	●	●
Operational				
M(ii) 7:	Promoting flexible working practices	Businesses, representative organisations	●	●
M(ii) 8:	Low emission fleet and freight vehicles	Fleet managers	●	●
M(v) 4:	Kerbside collection for biodegradable waste	Businesses	●	●
A(ii) 10:	Retrofitting existing buildings	Property owners	●	●
Education				
M(i) 11:	Information on how to be energy (and water) efficient	Registered Social Landlords	●	●
M(i) 12:	Energy efficiency in existing buildings	Property owners	●	●

Table 22: Priority actions for insurance industry, construction, development and design industry

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C4:	DPDs and SPDs requirements in development proposals	Developers and their advisers (e.g. architects, surveyors and engineers)	●	●
C6:	Development checklists	Developers and their advisers	●	●
C8:	Code for Sustainable Homes	Developers and their advisers	●	
M(i) 1:	Energy efficiency targets in DPDs	Developers and their advisers	●	●
M(ii) 5:	Preparation of travel plans	Developers	●	●
M(iv) 1:	Renewable energy targets in DPDs and SPDs	Developers and their advisers	●	●
M(iv) 2:	Integrating CHP and mini / micro CHP in developments	Developers and their advisers	●	●
A(i) 5:	Water resources and water quality in DPDs and SPDs	Developers	●	●
A(i) 9:	Flood risk management plans and strategies	Developers and their advisers	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
A(v) 1:	Undertaking Strategic flood risk Assessments	Developers and their advisers	●	●
A(v) 2:	Contributions to Strategic Flood Risk Assessments	Developers and their advisers	●	●
A(v) 3:	Developer contributions to strategic flood risk management	Developers and their advisers	●	●
A(v) 4:	Flood risk and development briefs / area based SPDs	Developers and their advisers	●	●
A(v) 5:	Reflecting CFMPs in LDD	Developers and their advisers	●	●
A(v) 6:	Use planning requirements to develop improved flood defences	Developers and their advisers	●	●
A(v) 9:	Use of landscape features to absorb flood water	Developers and their advisers	●	●
Operational				
M(i) 2:	Building and energy standards (BREEAM, Eco Homes, SAP and NHER)	Developers and their advisers	●	●
M(i) 3:	Strengthening and enforcing Building Regulations	Developers and their advisers, builders, construction trade associations	●	●
M(i) 4:	Designing buildings to increase their thermal mass	Developers and their advisers	●	●
M(ii) 2:	Phasing of public transport infrastructure	Developers and their advisers	●	●
M(iii) 1:	Supporting the creation of woodland in DPDs	Developers and their advisers	●	●
M(iii) 2:	Creation of new woodland as part of developments	Developers and their advisers	●	●
M(iii) 7:	Promoting wood products in construction	Developers and their advisers	●	●
A(i) 6:	Flood risk and development sites	Developers and their advisers, Insurance companies / ABI	●	●
A(i) 7:	Flood risk assessments	Developers and their advisers	●	●
A(i) 8:	Assessment of high risk locations	ABI	●	●
A(i) 15:	Managing and planning for subsidence	Developers and their advisers, ABI	●	●
A(ii) 1:	Flood Risk Assessments	Developers and their advisers	●	●
A(ii) 2:	Repairs to flooded properties	Insurance companies	●	●
A(ii) 3:	Development outside of high flood risk areas	Developers and their advisers	●	●
A(ii) 4:	Use of planning conditions and obligations to increase resilience to flooding	Developers and their advisers	●	●
A(ii) 8:	Resilience of foundations	Developers and their advisers	●	●
A(ii) 9:	Density and design of houses and buildings	Developers and their advisers	●	●
A(iii) 2:	Adoption and maintenance of SUDS	Developers and their advisers	●	●
A(iii) 4:	Incorporating SUDS into developments	Developers and their advisers	●	●
A(iii) 6:	Use of planning conditions and obligations to secure water efficiency and conservation	Developers and their advisers	●	●
A(iv) 6:	Flood storage capacity	Developers and their advisers	●	●
A(v) 20:	Habitat creation	Developers and their advisers	●	●
Standards / regulations				
A(i) 11:	Linking water resources planning and wider development planning	Developers	●	

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Education				
M(i) 11:	Information on how to be energy (and water) efficient	Developers	●	●
M(i) 12:	Energy efficiency in existing buildings	Developers, architects and builders	●	●
A(ii) 5:	Use of informative to raise awareness of flooding issues	Developers and their advisers	●	●
A(ii) 7:	Information on flood risk	Developers and their advisers	●	●

Table 23: Priority actions for tourism and leisure industry

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C7:	Climate proofing plans and strategies	Tourism and leisure industry	●	●

Table 24: Priority actions for agricultural and forestry industry, landowners and land and heritage managers

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
A(v) 7:	Flood risk management and farming / forestry land management	Forestry Commission, farmers, land managers	●	●
A(v) 8:	River Basin Management Plans	Forestry Commission, farmers, land managers	●	●
A(v) 13:	Habitat creation as part of agri-environment initiatives	Farmers and land managers	●	
A(v) 14:	Review of agri-environment schemes and BAP targets	Farmers, agricultural advisers and representative groups, land managers	●	●
Operational				
M(iii) 4:	Management of woodland to maximise carbon capture	Forestry Commission, woodland owners	●	●
M(iii) 5:	Community woodlands	Forestry Commission, woodland owners	●	●
M(iii) 6:	Land and forestry management for carbon capture	CLA, NFU, Forestry Commission	●	
M(iii) 8:	Carbon accounting	Forestry Commission, CLA, land managers	●	●
M(iv) 10:	Supporting bio-fuels	NFU, CLA, agricultural consultants, farmers	●	●
M(iv) 11:	Forestry products for renewable power generation	Forestry Commission, woodland owners	●	●
A(iv) 4:	Rural land use and agricultural practices	Landowners, farmers	●	●

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
A(v) 17:	Coppiced wood for bio-fuel	Forestry Commission, NFU , farmers, landowners	●	●
A(v) 21:	Suitability of woodland planting stock	Forestry Commission, landowners	●	●
A(v) 22:	Monitoring trees, woodlands and forests	Forestry Commission, landowners	●	●
A(v) 23:	Management of green spaces for wildlife movement	Land managers	●	●
Education				
M(iii) 9:	Advice to land managers	Forestry Commission, CLA, land managers	●	●
M(iv) 9:	Promote biomass energy crops	NFU, CLA, agricultural consultants, farmers	●	●
A(iv) 3:	Agricultural winter water storage reservoirs and farming practices in DPDs and SPDs	NFU, farmers	●	●

Table 25: Priority actions for research and academic institutions / higher and further education

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Operational				
M(i) 5:	Refurbishing publicly owned buildings	Universities	●	●
Research & monitoring				
C12:	Climate change research	Universities, researchers	●	●
A(v) 11:	Research on the ability of species to track changes in their suitable climate space	Universities, researchers	●	●

Table 26: Priority actions for NGOS / voluntary organisations

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C1:	Local Authority climate change strategies	NGOs	●	
A(v) 7:	Flood risk management and farming / forestry land management	Wildlife Trusts	●	●
A(v) 8:	River Basin Management Plans	Wildlife Trusts	●	●
A(v) 13:	Habitat creation as part of agri-environment initiatives	Wildlife Trusts, local biodiversity partnerships	●	
A(v) 14:	Review of agri-environment schemes and BAP targets	Local biodiversity groups , Wildlife Trusts, RSPB	●	●
A(v) 18:	Spread of intertidal and freshwater habitats further up river valleys	Local biodiversity partnerships, Wildlife Trusts, RSPB	●	●
Operational				
M(iii) 4:	Management of woodland to maximise carbon capture	SERLAWN, Woodland Trust	●	●
M(iii) 5:	Community woodlands	SERLAWN, Woodland Trust	●	●

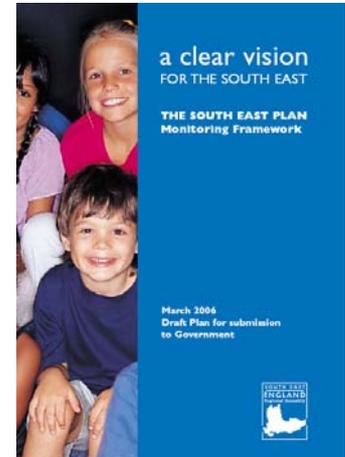
Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
M(iii) 6:	Land and forestry management for carbon capture	Woodland Trust	●	
A(v) 15:	Translocation of threatened species	Wildlife Trusts	●	●
A(v) 16:	Extent of managed nature reserves	Wildlife Trusts, RSPB	●	●
A(v) 19:	Protect against fragmentation and sites acquisition to support biodiversity	Wildlife Trusts, RSPB	●	●

Table 27: Priority actions for community groups and households / individuals

Action ref. no.	Priority actions	Who? (Lead in bold / support not in bold)	Now (2006-2010)	Later (2010+)
Plans & policies				
C1:	Local Authority climate change strategies	Local residents, communities	●	
A(v) 6:	Use planning requirements to develop improved flood defences	Local communities	●	●
Operational				
M(v) 4:	Kerbside collection for biodegradable waste	Householders	●	●
A(ii) 2:	Repairs to flooded properties	Property owners	●	●
A(ii) 10:	Retrofitting existing buildings	Property owners	●	●
Research & monitoring				
M(ii) 12:	Monitoring access to quality services and travel demand	Local strategic partnerships	●	
Education				
M(i) 12:	Energy efficiency in existing buildings	Property owners	●	●

5. MONITORING

5.1 It is proposed that the delivery of this Implementation Plan will be monitored on a regular basis through annual monitoring report on the implementation of the South East Plan. This will include monitoring against a limited number of indicators that are already collated for other purposes covering the principles in Policy CC2. The Monitoring Framework for the South East Plan published alongside the draft submitted to Government in March 2006 includes indicators it is proposed will be used to monitor the implementation of the Plan. There are indicators included specifically under Policy CC2, as well as some within other sections including Transport, Sustainable Natural Resource Management (e.g. strategic water resource development and energy efficiency and renewable energy) and Minerals and Waste that are relevant to the Climate Change Implementation Plan. The indicators included under Policy CC2 in the Monitoring Framework and their source are:



- Emissions of greenhouse gases by source (Netcen/DTI)
- Renewable energy capacity installed by type (Energy Statistics)
- Percentage of new build and retrofit homes meeting EcoHomes Very Good standard (BRE)
- Percentage of commercial buildings meeting BREEAM Very Good standard (BRE)
- Number of planning permissions granted contrary to the advice of the Environment Agency on either flood defence grounds or water quality (Environment Agency)
- New development with SuDS installed (source to be confirmed)

5.2 Other existing sources of indicators include the Regional Assembly's Integrated Regional Framework, Countryside Agency's State of the Countryside in the South East and Environment Agency's State of the Environment in the South East.

5.3 Policy CC2 includes a target to reduce the region's carbon dioxide emissions by at least 20% below 1990 levels by 2010 and by at least 25% below 1990 levels by 2015. A commitment is also included to develop a target for 2026 which will be incorporated in the first review of the Plan. In order to monitor progress toward achieving the targets, a need has been identified to develop an inventory of greenhouse gas emissions.

5.4 As reported in the summary of the SECTORS report, the South East Climate Change Partnership has been working on developing climate change indicators. A range of 56 potential indicators appropriate to the South East has been identified and tested through stakeholder workshops (this includes state, pressure and response

indicators). This has led to a set of 25 recommended indicators (see Appendix 3). This is the first stage in deriving a full set of accepted climate change indicators for the South East and further development is required.

5.5 Of these 25 indicators, six are proposed as headline indicators:

- Annual average surface temperature.
- Quantity of summer rainfall.
- Quantity of winter rainfall.
- Sea level rise at Sheerness, Kent.
- Emissions of greenhouse gases.
- Installed capacity for energy production from renewable sources.

5.6 It is proposed that the Implementation Plan is updated on a regular basis to report of progress and revise the actions as necessary, including in response to the results of monitoring against the indicators. Whilst the Implementation Plan is being developed by the Regional Assembly, it is proposed that a wider group of stakeholders help maintain and provide an advisory and promotional role for the Climate Change Implementation Plan along with the other partners responsible for delivering the actions identified.

GLOSSARY OF KEY TERMS

Adaptation: action or adjustment taken by society in response to the actual or potential impacts of predicted climate change, which moderates harm or exploits beneficial opportunities.

Climate Change: climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as: "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 climate variability observed over comparable time periods." The UNFCCC makes a distinction between "climate change" attributable to human activities altering the atmospheric composition, and "climate variability" attributable to natural causes.

Climate proofing: actions taken to protect infrastructure, systems and processes against projected climate impacts for a period into the future.

Greenhouse effect: the result of certain gases in the atmosphere (so-called greenhouse gases) absorbing energy that is radiated from the Earth's surface, and so warming the atmosphere.

Greenhouse gas: a number of anthropologically produced and naturally occurring gases whose presence in the atmosphere traps energy radiated by the Earth. This property causes the greenhouse effect. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), and ozone (O₃) are the primary greenhouse gases in the Earth's atmosphere.

Informative: where it is inappropriate for local planning authorities to impose conditions or negotiate planning obligations, but where the local planning authorities considers that the developer should be made aware of certain matters, it is possible for them to attach a short statement known as an informative to any consent for planning permission.

Limited or low regret options: options for which the implementation costs are low while, bearing in mind the uncertainties with future climate change projections, the benefits under future climate change may potentially be large. (See also **no regret options**).

Mitigation: activities which seek to reduce the human effects on global warming by reducing the quantity of greenhouse gases released to the atmosphere.

No regret (adaptation) options (or measures): adaptation options (or measures) that would be justified under all plausible future scenarios, including the absence of man-made climate change. A no regret option could be one that is determined to be worthwhile now (in that it would yield immediate economic and environmental benefits which exceed its cost), and continue to be worthwhile irrespective of the nature of future climate. (See also **Limited or low regret options**.)

Planning conditions and obligations: are legal delivery mechanisms to deliver the requirements which are articulated in planning policy and guidance and through discussions with developers on planning applications.

Precautionary approach/principle: a principle which states that where there are threats of serious or irreversible damage, lack of scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. This approach is promoted by the Framework Convention on Climate Change to help "achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous man-made interference with the climate system".

Sequential test: the sequential test is set out in PPG25 and is applied to Flood Zones (of different probability) identified by the Environment Agency. It helps identify the type of development that may be appropriate in different flood zones based on risk of flooding. Note that ODPM recently consulted on a draft Planning Policy Statement (PPS) 25 on development and flood risk.

Sequestration: the process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through land-use change, afforestation, reforestation and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases and long-term storage underground.

Sink: any process, activity or mechanism that removes a greenhouse gas from the atmosphere.

Sustainable development: development which meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development tries to reconcile the needs of social and economic development with ecological conservation and environmental protection.

ABBREVIATIONS

AAP	Area Action Plan	MONARCH	Modelling Natural Resource Responses to Climate Change
ABI	Association of British Insurers	NFU	National Farmers Union
AMP	Asset Management Planning	NGO	Non Government Organisation
ASCCUE	Adaptation Strategies for Climate Change in the Urban Environment	NHER	National Home Energy Rating
BRANCH	Biodiversity Requires Adaptations in North West Europe under a CHanging Climate	N ₂ O	nitrous oxide
BRE	Building Research Establishment	O ₃	Ozone
BREEAM	Building Research Establishment Environmental Assessment Method	ODPM	Office of the Deputy Prime Minister
CAMS	Catchment Abstraction Management Strategies	Ofgem	Office of Gas and Electricity Markets
CBI	Confederation of British Industry	Ofwat	Office of Water Services
CFMP	Catchment Flood Management Plans	PCT	Primary Care Trust
CH ₄	Methane	PPG	Planning Policy Guidance
ChaMP	Coastal Habitat Management Plans	PPS	Planning Policy Statement
CIRIA	Construction Industry Research and Information Association	RBMP	River Basin Management Plans
CHP	Combined Heat and Power	R&D	Research and Development
CLA	Country Landowners Association	RPG	Regional Planning Guidance
CO ₂	carbon dioxide	RSS	Regional Spatial Strategy
CROWN	Composting and Recycling Our Waste Now	RSPB	Royal Society of the Protection of Birds
Defra	Department for the Environment, Food and Rural Affairs	RTFO	Road Transport Fuel Obligations
DfES	Department for Education and Skills	RTPI	Royal Town Planning Institute
DoT	Department of Transport	RTS	Regional Transport Strategy
DPD	Development Plan Document	SA	Sustainability Appraisal
DTI	Department for Trade and Industry	SAP	Standard Assessment Procedure (for energy rating of dwellings)
EEAS	Energy Efficiency Accreditation Scheme	SEA	Strategic Environmental Assessment
EEC	Energy Efficiency Commitment	SECCP	South East Climate Change Partnership
EERA	East of England Regional Assembly	SEEDA	South East England Development Agency
ERDF	European Regional Development Fund	SEERA	South East England Regional Assembly
ESPACE	European Spatial Planning: Adapting to Climate Events	SERLAWN	South East Region Local Authority Woodland Network
FRA	Flood Risk Assessment	SERTAB	South East Region Technical Advisory Body
EST	Energy Saving Trust	SESEP	South East Sustainable Energy Partnership
GOSE	Government Office for the South East	SEWAG	South East Waste Advisory Group
HECA	Home Energy Conservation Act (1995)	SFRA	Strategic Flood Risk Assessment
H ₂ O	Water vapour	SMP	Shoreline Management Plans
HSE	Health and Safety Executive	SPG	Supplementary Planning Guidance
ICT	Information Communications Technology	SPD	Supplementary Planning Document
I&DeA	The Improvement and Development Agency	SFRA	Strategic Flood Risk Assessments
IPPR	Institute of Public Policy Research	SSSI	Site of Special Scientific Interest
LDD	Local Development Documents	SUDS	Sustainable Urban Drainage Systems
LDF	Local Development Framework	tC yr-1	Tonnes of carbon equivalent per year
LGA	Local Government Association	TV Energy	Thames Valley Energy Agency
LTP	Local Transport Plan	UKCIP	UK Climate Impacts Programme
MtC	Million tonnes of carbon equivalent	UKWIR	UK Water Industry Research
		UNFCCC	United Nations Framework Convention on Climate Change
		WRAP	Waste and Resources Action Programme

APPENDIX 1: LIST OF ORGANISATIONS CONTRIBUTING TO THE DEVELOPMENT OF THE IMPLEMENTATION PLAN

The individuals and organisations listed below contributed to the drafting of the Implementation Plan. We also discussed the plan informally with many other individuals and organisations, including at the SECCP Annual Forum held at Hayling Island on 7th July 2005. We would like to thank all those who provided ideas and comments, including those who may inadvertently have been omitted from the list below. In addition, officers from the Regional Assembly, in particular David Payne and Jo Anderson, contributed throughout the preparation of the Implementation Plan.

Organisation	Contact
Consultees responding to the consultation draft (September 2005)	
East Sussex CC	Andy Arnold
Black and Veatch	Roger Middleton
British Wind Energy Association	Georgina Wong
Guilford Borough Council	David Harnett
English Nature	Claudia Chambers
Environment Agency	David Howarth
Environment Agency	Stuart McFadzean
Hampshire County Council	Alison Quant / Pennie Smith
ESPACE	Chitra Nadarajah
South East Water	David Spiller
UKCIP	Jacquelyn Harman
Government Office for the South East	Eike Muller
Surrey County Council	James Crask
National Farmers Union	John Archer
Oxford Brookes	Elizabeth Wilson
Portsmouth Water	A. R. Neve
ECI Oxford University	Pam Berry
Sustainability North West	Steven Glynn
Southampton City Council	Sustainability Team
South East Forum for Sustainability	Brenda Pollack
New Forest National Park Authority	Nick Evans
Wildlife Trusts in the South East	Ian Hepburn
Consultees responding to initial draft report and/or telephone/email correspondence (July/August 2005)	
Association of British Insurers (ABI)	Dr Sebastian Catovsky
Building Research Establishment (BRE)	David Crowhurst
CIRIA	Joanne Kwan
Council of British Archaeology	Peter Youngs
Countryside Agency	Mark Chessell
English Nature	Claudia Chambers and Wanda Fojt
Environment Agency	Steve Walker and Tim Reeder
Hampshire County Council	Bryan Boulton
Highways Agency	Simon Price
National Farmers Union (NFU) South East Region	John Archer
National Trust	Alan Watson and Jane Fletcher
Planning Officers Society (POS)	Ian Lindley
Royal Town Planning Institute (RTPI)	Jenny Crawford
RSPB	Chris Corrigan

Organisation	Contact
SECTORS Steering Group / TRL	Marilyn Burtwell
SECCP	Mark Goldthorpe
SEEDA	Martin Bolton and Amelda Astfalk
Surrey County Council	Preetie Bindra and James Crask
Thames Water	Sue Aistrup and Jason Stratton
Tourism South East	Paul Jeffries
Wildlife Trusts	Ian Hepburn
Members of the South East Plan Natural Resources and Climate Change Advisory Group (attending meeting July 21st 2005)	
Arun District Council	David Green
Environment Agency	Stephen Walker
ESPACE Project Manager	Chtira Nadarajah
Government Office for the South East	Paul Fellows
Hampshire County Council	Bryan Boulton
SEEDA	Simon Richardson
Surrey County Council	Phill Sivell
Thames Water	Jason Stratton
West Sussex County Council	Abby Pulham

APPENDIX 2: ROLES AND RESPONSIBILITIES OF DIFFERENT AUDIENCES

Audience	Principal responsibilities and areas of influence	Relevant themes in the draft South East Plan							
		Cross cutting	Economy & Tourism	Communication & Transport	Natural Resource Management	Countryside & Landscape	Cultural Heritage & the Historic Env.	Built and Urban Environment	Social, Health & Emergency Plan.
National policy makers / central government (e.g. DEFRA, ODPM, DTI, HM Treasury, DfES, DoT etc)	<ul style="list-style-type: none"> Providing the legislative and policy context for responding climate change (including national planning policy and building regulations) Fiscal measures and forms of support (e.g. grant schemes and subsidies through initiatives such as EST, Carbon Trust) Representing UK position in global / European arena Include climate change in National Curriculum Influencing stakeholders and promoting good practice (e.g. CSB) Undertaking research and monitoring performance 	✓	✓	✓	✓	✓	✓	✓	✓
National regulators / advisors (e.g. Environment Agency, Countryside Agency, English Nature, English Heritage, HSE, Ofwat, Met office)	<ul style="list-style-type: none"> Regulating activities under certain legislation etc (e.g. land drainage) Consultees for regional and local plans and development proposals Setting levels of investment within the private sector (e.g. OFWAT for water companies) Developing and implementing policy Data collection, record keeping and monitoring Support to private sector in meeting targets and responding to legislation change Promoting and advising on best practice 	✓	✓	✓	✓	✓	✓	✓	
Regional planners and policy makers (e.g. SEERA / GOSE / SEEDA)	<ul style="list-style-type: none"> Spatial planning, regional strategies, economic development Integration of climate change mitigation and adaptation actions with key regional and local policies (e.g. RES, RSS, LDFs) Research, data collection and monitoring Dissemination of good practice, benchmarking and toolkits / checklists Influence and support work of regional and local stakeholders Dissemination and integration of central government policies (GOSE) Lobbying at national and international level Leading by example 	✓	✓	✓	✓	✓	✓	✓	
Regional (and beyond) partnerships and networks (e.g. SECCP, ESPACE, sustainable business partnerships, South East Forum for Sustainability, London Climate Change Partnership)	<ul style="list-style-type: none"> Raising awareness of climate change mitigation and adaptation Education to change behaviour Broker communication between regional and local stakeholders, such as sharing best practice, workshops etc. Carrying out or commissioning research and a repository of research Develop partnerships and networks within and beyond region Provide and / or channel research and information especially in specific sectors 	✓	✓	✓	✓	✓	✓	✓	
Local authorities:	General: <ul style="list-style-type: none"> Raising awareness 	✓	✓	✓	✓	✓	✓	✓	

Audience	Principal responsibilities and areas of influence	Relevant themes in the draft South East Plan							
		Cross cutting	Economy & Tourism	Communication & Transport	Natural Resource Management	Countryside & Landscape	Cultural Heritage & the Historic Env.	Built and Urban Environment	Social, Health & Emergency Plan.
	<ul style="list-style-type: none"> Leading by example Ensure local authority policy is developed or updated with full awareness of climate change impacts and responsibilities (both mitigation and adaptation) Ensure building stock and estates adapts to and mitigates impacts on climate change 								
Councillors	<ul style="list-style-type: none"> Understand impacts and responses and support development of initiatives, planning and information Lobby / work in partnership at regional and national levels to ensure effective local response 	✓	✓	✓	✓	✓	✓	✓	
Chief Executives and senior managers	<ul style="list-style-type: none"> Understand impacts and responses and support development of initiatives, planning and information Support staff, and facilitate cross departmental working on climate change 	✓	✓	✓	✓	✓	✓	✓	
Development control officers	<ul style="list-style-type: none"> Encourage use of sustainability checklists for development Implement local policy and promote good practice e.g. promote water and energy efficiency in new and existing buildings e.g. through DPD requirements, SPDs and planning obligations and encourage sustainable urban drainage (SUDs) 	✓	✓	✓	✓	✓	✓	✓	
Environmental health officers	<ul style="list-style-type: none"> Assess and provide advice and information on health / environmental impacts Monitor air and water quality for climate related changes 	✓			✓		✓	✓	
Spatial planning officers	<ul style="list-style-type: none"> Allocate development in DPDs to account for flood risk and to safeguard land for water / habitat Ensure SEA and SA of LDDs and other plans / policies incorporate climate change Link other plans (e.g. CFMPs, SMPs) and the spatial planning system Ensure spatial planning reduces need to travel Develop local action plans, strategies and checklists Encourage small scale renewable and CHP energy schemes 	✓	✓	✓	✓	✓	✓	✓	
Transport planners	<ul style="list-style-type: none"> Consider climate change when developing LTPs Promote green transport plans Travel planning in support of local schools and businesses Improve pedestrian environments and reduce impact / use of vehicular traffic 	✓	✓	✓	✓	✓	✓	✓	
Waste and mineral planners	<ul style="list-style-type: none"> Consider climate change in developing waste LDFs More frequent collection of putrescible waste – to avoid health impacts Consider climate change contribution of different waste facilities Work in partnership to reduce waste 	✓			✓		✓	✓	
Emergency planners	<ul style="list-style-type: none"> Provide information on flooding / extreme weather to households Incorporate drought / high temperature / pollution incidences in emergency planning Account for flooding and extreme weather impacts / disruption 	✓	✓	✓	✓		✓	✓	
Local Education Authorities	<ul style="list-style-type: none"> Include climate change in curriculum 	✓							

Audience	Principal responsibilities and areas of influence	Relevant themes in the draft South East Plan							
		Cross cutting	Economy & Tourism	Communication & Transport	Natural Resource Management	Countryside & Landscape	Cultural Heritage & the Historic Env.	Built and Urban Environment	Social, Health & Emergency Plan.
Building and estate managers	<ul style="list-style-type: none"> Environmental and climate criteria incorporated into procurement and management practices Lead by example – weather-proofing, energy and water efficiency etc in public buildings 	✓			✓			✓	✓
Health service providers (e.g. Primary Care Trusts)	<ul style="list-style-type: none"> Identify need for addition health facilities Provide information and raise awareness of health impacts Training for health professionals Promote healthier lifestyles 	✓		✓	✓			✓	✓
Business and commerce (including representative organisations e.g. CBI, Chambers of Commerce etc)	<ul style="list-style-type: none"> Market and supply research in support of specific sectors and business groups Promote develop and exploit possible opportunities Travel plans and strategies Ensure strategic planning includes climate change (R&D, risk, site development, supply chain / procurement etc.) 	✓	✓	✓	✓				
Insurance industry (e.g. ABI)	<ul style="list-style-type: none"> Research risks and opportunities Raise awareness Lobby government etc Advice and guidance to households and business on minimising and managing risk Develop policy and promote best practice 	✓	✓	✓	✓	✓	✓	✓	✓
Construction, development and design industry (e.g. architects, landscape architects, engineers, house builders, trade and professional bodies)	<ul style="list-style-type: none"> Form partnerships in order to develop markets for sustainable materials and techniques Ensure / encourage greater take up and application of climate change resilient / adaptable buildings and materials Seek to exceed standards in all developments Make use of information and guidance available (such as checklists) Develop techniques, good practice etc 	✓	✓	✓	✓			✓	
Agricultural and forestry industry and landowners (e.g. NFU, farmers, Forestry Commission)	<ul style="list-style-type: none"> Raising awareness and providing information Prepare for change – modified growing seasons, new crops, bio-fuels etc. Protect and restore habitats to increase resilience Ensure efficient irrigation Restructure and replant woodlands Research into resistant species and practices Monitor change to trees and woodland Develop winter storage for water 	✓			✓	✓	✓	✓	
Land and heritage managers	<ul style="list-style-type: none"> Habitat and species management Encourage wise use of land – prepare for fire, flooding, etc. Adopt land management to minimise soil erosion and pollution Research and monitor impact of climate change on historic environment Protect historic sites and buildings, and review conservation plans 	✓			✓	✓	✓		

Audience	Principal responsibilities and areas of influence	Relevant themes in the draft South East Plan							
		Cross cutting	Economy & Tourism	Communication & Transport	Natural Resource Management	Countryside & Landscape	Cultural Heritage & the Historic Env.	Built and Urban Environment	Social, Health & Emergency Plan.
Utilities (e.g. water industry, energy providers, telecommunications industry)	<ul style="list-style-type: none"> Network and infrastructure impact assessments Risk assessments and mapping Emergency planning Planning and strategy to account for impacts, such as more intense rainfall Increase resilience and efficiency of networks and infrastructure Continue to develop demand management and efficiency Encourage behaviour change 	✓	✓	✓	✓	✓		✓	✓
Transport service providers and authorities	<ul style="list-style-type: none"> Ensure increased highway drainage and resilience Develop and promote public transport access strategies (for example to airports) Ensure waiting areas and facilities offer protection from weather / sun Review and upgrade fleet specifications 	✓		✓				✓	✓
Waste management and disposal industry	<ul style="list-style-type: none"> Monitor impacts on landfill sites Research and modify landfill design and location 	✓			✓	✓			✓
NGOs / voluntary organisations (e.g. Wildlife Trusts, National Trust)	<ul style="list-style-type: none"> Sector specific information and guidance Land management and land acquisition Education, support and lobbying 	✓	✓	✓	✓	✓	✓	✓	✓
Research and academic institutions / higher and further education (e.g. Tyndall Centre, UKCIP)	<ul style="list-style-type: none"> Support activities of other organisations through targeted research and monitoring Develop strategic view of changes and impacts to enable long-term response and planning Build knowledge and provide information necessary for monitoring Translate science into information for practical use and awareness raising – through guidance and good practice 	✓	✓	✓	✓	✓	✓	✓	✓
Schools	<ul style="list-style-type: none"> Educate and encourage pupils to understand and behave differently Ensure buildings and grounds are managed for adaptation Minimise energy and water use – lead by example Encourage travel planning 	✓		✓	✓		✓		✓
Tourism and leisure industry	<ul style="list-style-type: none"> Research into impacts on tourism numbers and destination changes Research into impacts on sites and facilities Review tourism strategies Modify and adapt facilities to account for change Monitor impacts and changes 	✓	✓	✓	✓	✓	✓	✓	✓
Community groups and households / individuals (e.g. Local Strategic Partnerships)	<ul style="list-style-type: none"> Raise awareness and provide information Encourage behaviour change 	✓		✓	✓	✓	✓	✓	✓

APPENDIX 3: POTENTIAL REGIONAL CLIMATE CHANGE INDICATORS

List of indicators recommended for adoption by SECCP.

Indicator Name	Sectors	Links to Other Sets / Likely Data Source	Headline or Specialist	Comments
Annual average surface temperature	All	National (#1) and SoE (#22)	Headline	Need SE data
Frequency of Intense Precipitation	A, T, UI	FCD	Specialist	
Quantity of summer rainfall	A, B, T, UI	SoE (#15), seasonality in National (#2)	Headline	May need a regional index
Quantity of winter rainfall	A, B, T, UI	SoE (#15), seasonality in National (#2)	Headline	May need a regional index
Sea level rise at Sheerness, Kent	P, T	National (#9), SoE (#23), FCD	Headline	
Frequency of river high flows	BE, P, EP, UI	National (#7), FCD	Specialist	
Frequency of low river flows	A, B, UI	National (#7)	Specialist	
Soil moisture	A, B	National (#5)	Specialist	Need further definition
High groundwater levels	B, UI	National (#8), SoE (#16), FCD	Specialist	
Low groundwater levels	B, UI	National (#8), SoE (#16)	Specialist	
Date of insect appearance and activity	B	National (#27), SF	Specialist	
Insect abundance	B	National (#28), SF	Specialist	
Egg-laying dates of birds	B	National (#30)	Specialist	Need regional data
Arrival date of the swallow	B	National (#29)	Specialist	Dungeness used in national set
Date of leaf emergence on trees in spring	B	National (#25)	Specialist	Record from Ashtead, Surrey
Health of beech trees	B	National (#26)	Specialist	
Number of outdoor fires	B, EP, T	National (#16)	Specialist	
Area of vines	A	National (#22)	Specialist	Need regional data
Emissions of greenhouse gases	UI	IRS (#26), RSDF (#21)	Headline	
Installed capacity for energy production from renewable sources	UI	IRS (#43), RSDF (#36)	Headline	
Atmospheric ozone levels in summer in rural areas	H	National (#11). Related to IRS (#25), RSDF (#18), SoE (#1)	Specialist	Note caveats
Household consumption of gas (winter % of annual)	UI	National (#13). Related to IRS (#13), RSDF (#7)	Specialist	Note caveats
Length of the thermal growing season	A	New National Indicator	Specialist	
Frequency of grit applied to roads	BE, UI	Highways Agency, Local Authorities	Specialist	New indicator; needs support
Heat wave alerts	H	Met Office	Specialist	

KEY: A = Agriculture; B = Biodiversity; BE = Business & Economy; EP = Emergency Planning; H = Health; P = Planning; T = Tourism; UI = Utilities and Infrastructure; FCD = (National) Flood and Coastal Defence environmental change indicators (Law et al., 2003); IRS = (Draft) Integrated Regional Strategy indicators (Integrated Regional Strategy Working Group, 2004); National = UK climate change indicators (Cannell et al., 1999; Defra, 2004); RSDF = Regional Sustainable Development Strategy indicators (SEERA, 2001); SF = Solent Forum potential indicators for the Solent (Solent Forum, 2003); SoE = State of the Environment report indicators (Environment Agency, 2003)