



National Audit Office

A REVIEW FOR THE
ENVIRONMENTAL
AUDIT COMMITTEE

JULY 2009

Adapting to Climate Change

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National Audit Office

Adapting to Climate Change

A REVIEW FOR THE ENVIRONMENTAL AUDIT COMMITTEE
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This briefing by the National Audit Office is in response to a request from the Environmental Audit Committee to provide an overview of government policy on adapting to climate change, including the implications of the Climate Change Act 2008 and the cross-government Adapting to Climate Change Programme, and progress across government Departments in identifying and managing risks from future climate change impacts.

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This review was conducted by
Jonathan Bayliss, Nia Davies,
Charlie Gluckman, Amanda Simpson
and Phil Hyde, under the direction of
Jill Goldsmith.

For further information about the
National Audit Office please contact:

National Audit Office
Press Office
157-197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400

Email: enquiries@nao.gsi.gov.uk

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Summary

1 Much of the debate about climate change policy in recent years has focused on the efforts needed to reduce greenhouse gas emissions and thus mitigate climate change. But most of the changes in climate that will happen over the next 30 to 40 years have already been determined by past and present emissions. Scientific evidence set out in the most recent projections of future climate change for the UK – the UK Climate Projections 2009 – shows that the UK is likely to experience warmer and wetter winters, hotter and drier summers, sea level rise, and more severe weather. The potential impacts of these changes include increased water stress, increased risk of flooding and heat waves, and faster coastal erosion. These impacts could have wide consequences across the UK, for example, by posing risks to the functioning of critical infrastructure such as energy, transport and water systems, or by posing risks to public health or the natural environment.

2 Adapting to the changing climate across society and the economy is therefore necessary to deal with the unavoidable impacts of climate change already in train. There will also be opportunities to take advantage from some more positive aspects of climate change in some sectors, for example, agriculture. If Government, the wider public sector and private organisations and individuals prepare for the future climate changes now, necessary adaptation can be identified early, planned for and undertaken in the most cost-effective way.

3 This briefing by the National Audit Office (NAO) is in response to a request from the Environmental Audit Committee to provide an overview of government policy on adapting to climate change, including the implications of the Climate Change Act 2008 and the cross-government Adapting to Climate Change Programme, and progress across government Departments in identifying and managing risks from future climate change impacts. It presents Departments' self-assessments of their current capacity to assess and manage these risks, using a framework for effective climate change risk management developed by the NAO for the purposes of this briefing.

4 Adaptation is a devolved issue, and this briefing covers government policy in England and the UK for reserved matters, not the work of the national authorities in Wales, Scotland or Northern Ireland in regard to their devolved functions. The briefing covers government policy on domestic climate change adaptation, rather than action internationally to help developing nations adapt to climate change.

Overview of government policy on adapting to climate change

5 The Climate Change Act 2008 (the Act) established a statutory framework for work on climate change adaptation, including the requirement to undertake a UK-wide Climate Change Risk Assessment (CCRA) and report on it within three years of the Act coming in to force (i.e. in January 2012), and also to set out a statutory National Adaptation Programme as soon as practically possible after publication of the CCRA and report on it at two yearly intervals.

- Paragraph 2.3 in Part 2 sets out the requirements of the Climate Change Act 2008 relating to adaptation.

6 The cross-government Adapting to Climate Change Programme (ACC Programme) was established in 2008 to bring together and drive forward work in Government and the wider public sector on adaptation in England and the UK for reserved matters. The ACC Programme is directed by a Programme Board with senior representatives from most central Government Departments. The Department for Environment, Food and Rural Affairs (Defra) provides the ACC Programme delivery team, but responsibility for embedding adaptation into individual government policies is the responsibility of the relevant government Department.

- Paragraphs 2.5 and 2.6 in Part 2 cover the governance arrangements for the ACC Programme.

7 The ACC Programme is currently undertaking the groundwork for the statutory National Adaptation Programme to be put in place by 2012, and the second phase of its work from 2012 will be to implement this National Adaptation Programme. The groundwork involves:

- Developing a more robust and comprehensive evidence base about the impacts and consequences of climate change on the UK.
- Raising awareness of the need to take action now and help others to take action.
- Working across Government to embed adaptation into Government policies, programmes and systems.
- Measuring success and taking steps to ensure effective delivery.

8 The ACC Programme is undertaking work to develop a more robust and comprehensive evidence base about the impacts and consequences of climate change on the UK to guide the priorities of the National Adaptation Programme. Key elements include:

- The UK Climate Change Projections 2009 (the Projections), published in June 2009, which set out the latest scientific evidence base on future climate changes for the UK.
- The UK Climate Change Risk Assessment (CCRA), the aim of which is to identify, assess, and where possible monetise the key climate change risks and opportunities at UK, national and regional level to inform government policy and spending.
- Additional 'adaptation economic analysis' to improve understanding of the costs and benefits of adaptation measures; to give an overall indication of the scale of the challenge; and to help identify priority areas for action.

The ACC Programme considers that the CCRA and the economic analysis are challenging and complex undertakings. It emphasises that the CCRA will be the first in a rolling cycle of national risk assessments, rather than a definitive assessment of all risks.

- Paragraphs 2.9 to 2.17 in Part 2 cover the ACC Programme work to develop the evidence base for adaptation.

9 The ACC Programme is also working to raise awareness of the need to take action now and help others to take action, through:

- The work of the UK Climate Impacts Programme (UKCIP), which since 1997 has been funded by Defra and the Devolved Administrations as an advisory service to help organisations access scientific information on climate change and consider their approach to adapting to climate change.
- A substantial training and support programme, to be delivered by UKCIP and the ACC Programme, to help users understand and get the most out of the new Projections.¹
- The ACC Programme's Local and Regional Partnership Board, which brings together key stakeholders across local and regional government, and aims to facilitate action on climate change adaptation at a local and regional level by highlighting best practice, enhancing skills, providing toolkits and encouraging joint working between local and regional agencies. The Board has a small funding programme which supports projects to meet its aims.
- Paragraphs 2.18 to 2.21 in Part 2 cover the ACC Programme work to raise awareness and help others to take action.

¹ "The Projections in Practice": <http://www.defra.gov.uk/environment/climatechange/adapt/adaptation/projections-in-practice.htm>

10 The ACC Programme is working to embed adaptation into Government policies, programmes and systems. The ACC Programme recognised at its launch in 2008 that “there was a long way to go until all Government programmes routinely consider climate change risks at policy and delivery stages, and are planned accordingly”, and highlighted that it was particularly important for infrastructure and investment decisions with a long life-span to take into account the long term consequences of climate change to avoid the need for costly retrofitting. Key developments include:

- New guidance to help Government address adaptation in government policy and investment appraisal and decision making processes. This supplementary guidance for the HM Treasury’s Green Book: *Appraisal and evaluation in central government*, was published alongside the launch of the Projections in June 2009.
- A project to identify and overcome relevant barriers to improving the future resilience of water, energy and transport infrastructure – for example, from financing, regulatory arrangements, or lack of awareness, skills or expertise, as well as the technical risks.
 - Paragraphs 2.22 to 2.33 in Part 2 cover ACC Programme work to embed adaptation into Government policies, programmes and systems.

11 The ACC Programme also wants to measure its success and take steps to ensure effective delivery of the Programme. Measuring progress on adaptation is difficult: the success of measures to increase resilience may not be observed for 30-50 years and most of the current effort is around building capacity to adapt through undertaking risk assessments, training and relevant research. The ACC Programme is working to develop indicators to measure its progress, but work is at an early stage. Other key elements include:

- A measure of progress on embedding adaptation into the National Indicators for measuring local government performance (NI 188), to be reported for the first time in summer 2009.
- A Reporting Power established under the Climate Change Act that allows Government to require public authorities and ‘statutory undertakers’ (companies such as water and energy utilities) to report to Government on how they have assessed relevant climate change risks, and how they will address them. The ACC Programme is consulting on a strategy for use of the Reporting Power, which proposes that 103 priority organisations should be asked to report in 2010, out of over 100,000 reporting authorities potentially covered by the terms of the Act. There is currently no statutory requirement for this to apply to private sector companies that do not fall under the ‘statutory undertakers’ definition under the Act.

- The recent commitment by Departments involved in the ACC Programme to prepare high-level Adaptation Plans by spring 2010. The ACC Programme expects to start collecting information systematically to report on departments' progress in key policy areas to the Programme Board. It has not yet specified whether, or how, departments' capacity to adapt will be gauged or reported, as this will be done in the context of the development of the new Departmental plans.
 - Paragraphs 2.34 to 2.40 in Part 2 cover the ACC Programme work to measure its success and ensure delivery of the Programme.

12 The Climate Change Act also established the Adaptation Sub-Committee (ASC) of the Committee on Climate Change to provide external expertise and scrutiny on adaptation work. The ASC has a statutory duty to provide advice and scrutiny on the UK Climate Change Risk Assessment, report on progress with the National Adaptation Programme (for England and reserved matters), and respond to requests for advice on adaptation from national authorities (of England, Scotland, Wales and Northern Ireland).

- Paragraph 2.4 in Part 2 covers the ASC.

Departments' self-assessment of their current capacity to assess and manage risks from future climate change impacts

13 Climate change adaptation, and assessment of risks from future climate change impacts, is a relatively new issue for most Departments, but Departments' responses to our survey showed signs of growing awareness and understanding, progress in identifying and assessing risks, and examples of individual policy responses. Most of the Departments which were in a position to assess the significance of risks from future climate change impacts concluded that these risks are potentially significant to some of their objectives, whereas Defra considers climate change risks to be significant threats to all of its Departmental objectives. Departments identified a wide range of risks that they needed to manage, in particular the risks of flooding and coastal erosion, to business and the economy, infrastructure, agriculture, food security and the natural environment, homes, buildings and communities, and public health.

- Part 3 sets out an overview of Departments' current assessment of risks from future climate change impacts, and examples of policy responses.

14 In Departments' self-assessment of their current capacity to assess and manage climate change risks, some Departments, such as the Department for Communities and Local Government, Defra, the Ministry of Defence, the Department of Energy and Climate Change, and the Forestry Commission, considered they were at the stage of implementing climate change risk management strategies, others, such as the Department for Business, Innovation and Skills (formed from the Department for Innovation, Universities and Skills and the Department for Business, Enterprise and Regulatory Reform, which are represented separately in this briefing), the Home Office and the Ministry of Justice, reported to us that they were at an earlier stage in developing their capacity to manage these risks. However, even these Departments were able to highlight relevant risks to their objectives, and give examples of policy responses in some areas.

- Part 4 presents the results of Departments' self assessment of their current capacity to assess and manage climate change risks, using a framework for effective climate change risk management developed by the NAO for the purposes of this briefing.

15 Departments highlighted to us that climate change risk management is a challenge because of the long timescales and uncertainties involved; the difficulty in prioritising resources between addressing current needs and future risks; and the need to build capacity. Some of the actions required to adapt to a changing climate will involve significant costs. For example, the Environment Agency predicts that the potential cost of providing adequate flood defences is likely to double to £1 billion per year by 2035. Departments have highlighted to us that there will be more to do to develop the evidence base to reach risk-based decisions on adaptation, using quantitative evidence of the costs and benefits of adaptation as developed by the CCRA and associated economic analysis, and deciding upon approaches to funding them.

- Appendix 3 contains a summary of each individual Department's self-assessment of the risks to their objectives and their capacity to assess and manage these risks.

Part One

Background

Introduction

1.1 Much of the debate about climate change policy in recent years has focused on the efforts needed to reduce greenhouse gas emissions and thus mitigate climate change. But most of the changes in climate that will happen over the next 30 to 40 years have already been determined by past and present emissions.² Adaptation to the changing climate across society and the economy is therefore necessary to deal with the unavoidable impacts of climate change already in train. There will also be the opportunity to take advantage from some aspects of the climate changes. The 2006 Stern Review on the Economics of Climate Change stated that “Adaptation will be crucial in reducing vulnerability to climate change and is the only way to cope with the impacts that are inevitable over the next few decades”.

1.2 This briefing by the National Audit Office (NAO) has been carried out in response to a request from the Environmental Audit Committee to provide an overview of climate change adaptation policy in England, including the implications of the Climate Change Act 2008, the cross-government Adapting to Climate Change Programme, and the current capacity across government Departments to assess and manage risks from future climate change impacts and adapt to climate change.

1.3 Adaptation is a devolved issue and this briefing covers government policy in England and the UK for reserved matters, not the work of the national authorities in Wales, Scotland or Northern Ireland in regard to their devolved functions. The briefing covers government policy on domestic climate change adaptation, rather than action internationally to help developing nations adapt to climate change. It presents central government-wide actions to identify, and manage, risks from future climate change and Departments’ current capacity to adapt. This capacity is indicated by self-assessment by Departments against a framework for effective climate change risk management which was developed by the NAO for the purposes of this review. Appendix 2 gives further details on the self-assessment framework.

² Department for Environment, Food and Rural Affairs (2009) *Adapting to climate change: UK Climate Projections*.

Global impacts of climate change

1.4 At the United Nations Framework Convention on Climate Change negotiations at Copenhagen in December 2009, the UK will be arguing for an agreement that limits global temperatures to no more than 2°C above pre-industrial levels.³ In 2007 the Intergovernmental Panel on Climate Change (IPCC) set out its assessment of the projected global impacts of climate change, showing the impacts if temperature rises are limited to 2°C.⁴ The global consequences significantly affect water, ecosystems, food supply, coastal regions and public health, and will become more severe if emissions continue and the degree of temperature rise increases (**Figure 1** overleaf). The consequences of climate change are expected to be felt most severely by developing nations.

UK specific impacts

1.5 Work on the potential impacts of climate change for the UK is well-established – the Government has funded the UK Climate Impacts Programme (UKCIP) since 1997 and climate scenarios have been published since 1991. The Government has recently published the UK Climate Projections 2009 (the Projections), which set out the latest information on future climate change in the UK until 2099. The Projections suggest that, under a medium emissions scenario and using central estimates of the projected changes, our climate might change as follows:⁵

- All areas of the UK get warmer, and the warming is greater in the summer than in the winter. For example, in the South West of England summer temperatures may result in an increase in the region of 3.9°C by 2080.⁶
- There may be little change in the amount of precipitation (rain, hail, snow etc.) that falls annually, but it is likely that more of it will fall in the winter, with drier summers, for much of the UK. For example, the South East of England could experience a 20 per cent decrease in summer rainfall⁷ while the North West could see winter rainfall increase by 16 per cent by 2080.⁸
- Sea levels rise, and are greater in the south of the UK than the North. For example, by 2080 London is likely to experience sea-level rise in the region of 36 centimetres compared to average 1980-1999 levels.⁹

3 Department of Energy and Climate Change (2009) *The Road to Copenhagen: The UK Government's case for an ambitious international agreement on climate change*.

4 Intergovernmental Panel on Climate Change (2007) *Fourth Assessment Report*.

5 The 'central estimate' for an outcome of a particular scenario indicates the level (for example, temperature increase) that has an equal probability of being exceeded or not exceeded. Low, medium and high emissions indicate the emissions trajectory used in a scenario. For further details refer to Defra (2009) *Adapting to climate change: UK Climate Projections*.

6 UK Climate Projections (2009) *Key Findings*. Available at <http://ukcp09.defra.gov.uk/content/view/39/6/index.html>

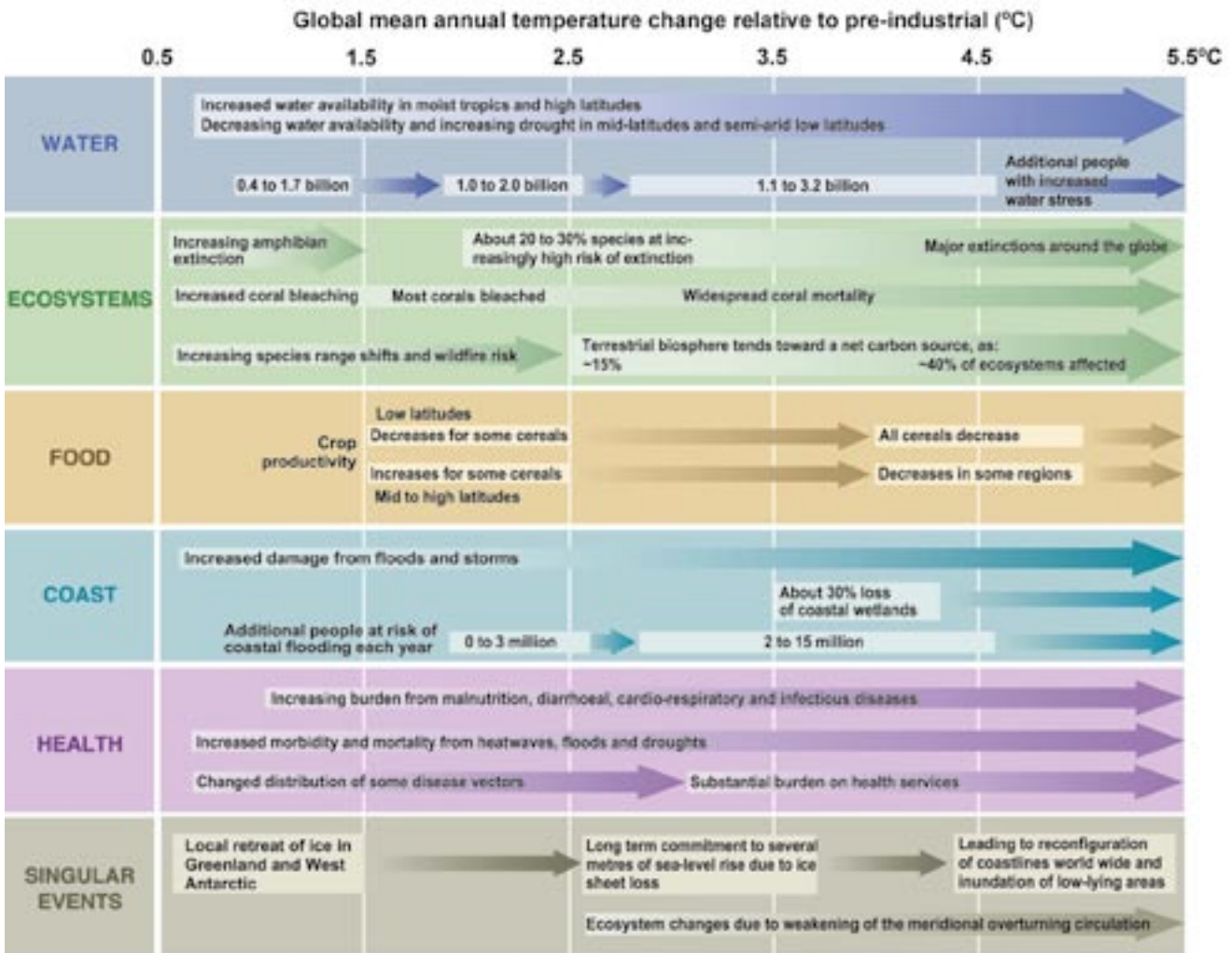
7 Ibid.

8 Ibid.

9 Department for Environment, Food and Rural Affairs (2009) *Adapting to climate change: UK Climate Projections*.

Figure 1

Projected global impacts of a warming climate increase with temperature rise



Source: Simplified version of Table TS3 in the 2007 Technical Summary, Working Group II, for the IPCC 4th Assessment Report¹

NOTE

¹ Parry, M.L., O.F. Canziani, J.P. Palutikof and Co-authors 2007: Technical Summary. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L.Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 23-78.

1.6 These climate changes could have a wide range of impacts such as water shortages and flooding; heat waves affecting human health and disease patterns; changes in biodiversity, crop and animal disease risks; and more natural disasters and emergencies worldwide, with impacts on the UK insurance industry. The UK could also experience knock-on effects from the impacts from climate changes in other parts of the world, such as changes in food supply and security; political stability; and migration patterns. Alongside these negative impacts, warmer summers might be seen by many as a beneficial impact of climate change, and warmer winters would reduce cold-related deaths. The significance of the potential impacts depend on the vulnerability of the environment and society to these impacts, which is influenced by a wide range of practical, social and economic factors specific to the situation.

International and EU context for domestic climate change adaptation

1.7 The 1992 United Nations Framework Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It places a commitment on governments to make progress in adapting to climate change. Governments are required to report on progress in tackling climate change via national assessments of mitigation and adaptation work at regular intervals. To date, the UK has published five National Assessments. The most recent assessment¹⁰, released in June 2009, provided an overview of the work of the UK Government and the devolved administrations on adapting to climate change, including the cross-government Adapting to Climate Change Programme and the implementation of the Climate Change Act 2008.

1.8 At the EU-level, action on adapting to climate change is being driven through the April 2009 White Paper *Adapting to climate change: Towards a European framework for action*.¹¹ In pursuing the aims of its White Paper, the EU hopes to facilitate coordination and the exchange of best practice between Member States. The White Paper proposes a two-phased approach and intends to foster a more strategic approach to climate change adaptation across the EU. Phase One, which will run from 2009 until 2012, will lay the ground work for preparing a comprehensive EU adaptation strategy to be implemented during Phase Two, commencing in 2013. Phase One will focus on four key pillars of action:

- Building a solid knowledge base on the impact and consequences of climate change in the EU;
- Integrating adaptation into EU key policy areas;

¹⁰ Department of Energy and Climate Change (2009) *The UK's Fifth National Communication under the United Nations Framework Convention on Climate Change*.

¹¹ European Commission (2009) *White Paper: Adapting to climate change: Towards a European framework for action*.

- Employing a combination of policy instruments to ensure effective delivery of adaptation; and
- Fostering international cooperation on adaptation.

The UK is one of nine¹² Member States to have already published its own strategy for work on adaptation before the publication of the EU White Paper.

How we approached this review

1.9 This review is based on an examination of publicly available documentation, interviews with officials from the ACC Programme, and a written survey of government Departments on the risks to their objectives from future climate change impacts, and to obtain their self-assessment of their current capacity to manage these risks. Our methodology is set out in Appendix 1.

1.10 The review is structured as follows:

- **Part 2:** Overview of government policy on adapting to climate change, including the implications of the Climate Change Act 2008 and the cross-government Adapting to Climate Change Programme.
- **Part 3:** Overview of Departments' current assessment of risks from future climate change impacts, and key policy responses.
- **Part 4:** Departments' self-assessment of their current capacity to assess and manage climate change risks.

¹² The UK is one of nine countries that have published National Adaptation Strategies – the others being Denmark, Finland, Germany, France, Hungary, Netherlands, Spain, and Sweden. European Commission (2009) *Living with climate change in Europe*. Available at http://ec.europa.eu/environment/climat/adaptation/index_en.htm

Part Two

Government policy on adapting to climate change

Overview

2.1 The Government committed itself to develop a robust approach to domestic adaptation to climate change, shared across government, and to encourage adaptation to climate change internationally, in Public Service Agreement 27 (PSA 27), which sets out the overall requirement for the UK to lead the global effort to avoid dangerous climate change. With the creation of the Department of Energy and Climate Change (DECC), overall lead responsibility for PSA 27 has passed to DECC from the Department for Environment, Food and Rural Affairs (Defra). Defra remains a key delivery partner, with responsibility for developing a cross-government approach to adapting to climate change.

2.2 This Part of our briefing sets out an overview of government policy on adapting to climate change, including:

- Implementation of the Climate Change Act 2008.
- The cross-government Adapting to Climate Change Programme.

The Climate Change Act 2008

2.3 The Climate Change Act 2008 (the Act) has established a statutory framework for work on climate change adaptation, as well as setting legally binding long term targets for carbon emissions (**Figure 2** overleaf).

The Adaptation Sub-Committee

2.4 The Act established an Adaptation Sub-Committee (ASC) of the statutory Climate Change Committee as a source of independent expertise and scrutiny of Governments' work on climate change adaptation. The ASC has a statutory duty to provide advice and scrutiny on the Climate Change Risk Assessment, report on progress with the National Adaptation Programme, and respond to requests for advice from national authorities on adaptation. The Chair was appointed at the end of May 2009, and members of the ASC were appointed at the end of June 2009. A secretariat is in place. The first meeting took place on the 30 July 2009. The first task of the ASC will be to develop its work programme.

Figure 2

The Climate Change Act 2008

As well as setting legally binding long term targets for carbon emissions, the Climate Change Act 2008 established a legislative framework for government action to ensure the UK effectively adapts to climate change. Key elements include:

- A requirement for Government to undertake a UK-wide **Climate Change Risk Assessment (CCRA)** every five years, the first to report within three years of the Act coming into force (i.e. in January 2012);
- A requirement for Government to put in place a **National Adaptation Programme** to address the most pressing climate change risks to England, as soon as practically possible following the first CCRA;
- A new **Reporting Power** for Government to be able to require public authorities and statutory undertakers (companies such as water and energy utilities) to report on how they have assessed relevant climate change risks and how they will address them;
- A requirement for Government to publish a strategy on how this new power will be used, and provision for the Government to be able to publish accompanying **Statutory Guidance** for reporting authorities; and
- Creation of the **Adaptation Sub-Committee** of the Committee on Climate Change to oversee progress on the National Adaptation Programme and advise on the CCRA.

Source: National Audit Office summary of the Climate Change Act 2008¹

NOTE

1 Department for Environment, Food and Rural Affairs (2008) *How will the Act help adaptation?* Available at <http://www.defra.gov.uk/environment/climatechange/adapt/legislation/adaptation.htm>

The cross-government Adapting to Climate Change Programme

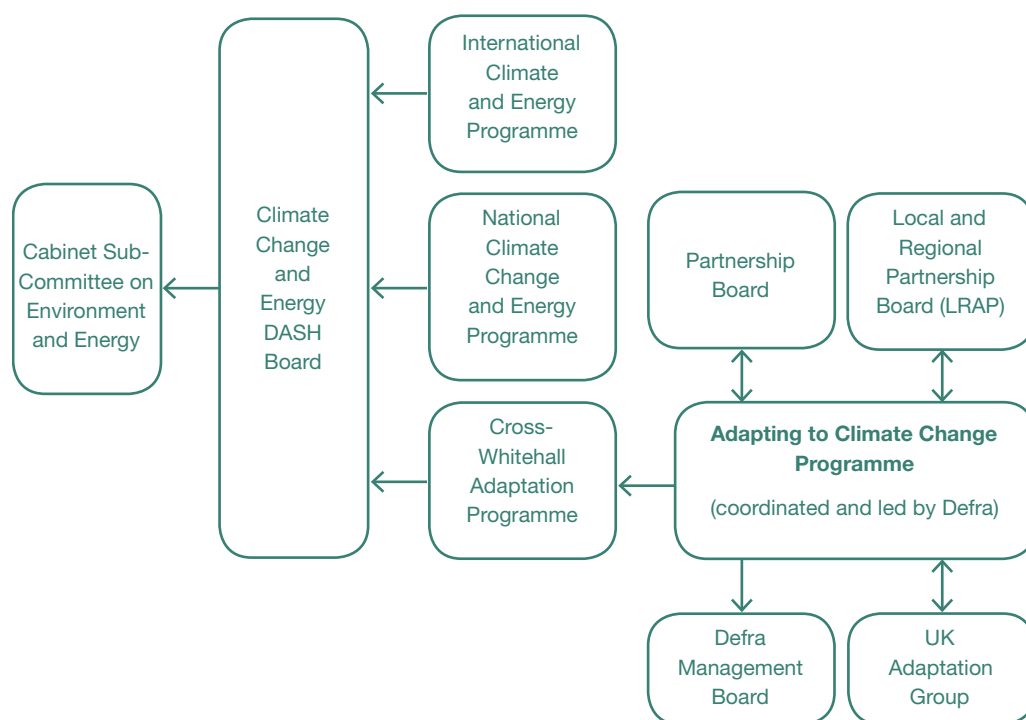
2.5 The cross-government Adapting to Climate Change Programme (ACC Programme) was established in 2008 to bring together and drive forward work in Government and the wider public sector on adaptation in England and the UK for reserved matters. The ACC Programme is overseen by a Programme Board with representatives (at senior civil service level) from most Departments to ensure it is driven across Whitehall.¹³ The Programme Board determines priorities for the ACC Programme, including the initiation of joint projects across Departments. The Programme Board reports upwards to the Climate Change and Energy Delivery and Strategy High-level Board (DASH Board), which is responsible for overseeing delivery of the Government's climate change and energy objectives and reports to the Cabinet Sub-Committee on Environment and Energy (ED(EE)).¹⁴ Defra provides the ACC Programme delivery team, which also reports to the Defra Management Board as adapting to climate change is one of Defra's Departmental Strategic Objectives (DSOs). Responsibility for embedding adaptation into individual government policies is the responsibility of the relevant government Department, not the ACC Programme or Defra.

¹³ All central government Departments, with the exception of the Foreign and Commonwealth Office (FCO) and the Department for International Development (DfID) are represented on the Board. FCO and DfID receive papers, and are currently considering becoming full members. The Environment Agency, Natural England, the Forestry Commission and Government Office London on behalf of the Government Offices also sit on the Board.

¹⁴ The Cabinet Sub-Committee on Environment and Energy is a sub-committee of the Ministerial Committee on Economic Development. Its terms of reference are "to consider international and domestic policy on environment and energy issues; and report as necessary to the Committee on Economic Development and the Committee on National Security, International Relations and Development".

2.6 The ACC Programme has had good engagement across Whitehall and has involved external stakeholders in the Programme extensively, to steer its direction and to be involved in its implementation (**Figure 3**). Working with the Government Office for London, UKCIP and other stakeholders, the ACC Programme established a Local and Regional Partnership Board (LRAP) in 2008, to engage and bring together representatives from local and regional government and key bodies such as the Environment Agency and UKCIP, and to facilitate action on climate change adaptation at a local and regional level. The ACC Programme also established a Partnership Board in March 2009 to engage wider stakeholders from across the public and private sectors and to provide external advice to the ACC Programme. A UK adaptation group brings together representatives of England, Scotland, Wales and Northern Ireland to ensure work on adaptation can be coordinated across the UK where necessary, and cross-border issues addressed.

Figure 3
Governance structure for the ACC Programme



Source: National Audit Office, based on information from the ACC Programme

NOTE

Individual projects such as the Climate Change Risk Assessment and the Reporting Power also have steering groups made up of government Departments and other stakeholders as appropriate, which are not shown.

2.7 The ACC Programme is undertaking the groundwork for the statutory National Adaptation Programme to be put in place by 2012, as required by the Climate Change Act 2008, and the second phase of its work will be to implement this National Adaptation Programme. The groundwork for the statutory National Adaptation Programme involves:

- developing a more robust and comprehensive evidence base about the impacts and consequences of climate change for the UK;
- raising awareness of the need to take action now and help others to take action;
- working across Government at the national, regional and local level to embed adaptation into Government policies, programmes and systems; and
- measuring success and taking steps to ensure effective delivery.

2.8 The Defra ACC Programme team has taken a structured approach and organised its work by priority projects across the four workstreams (**Figure 4**). The team was established in 2008 with a budget of just over £2 million for the main programme activities and a further £2 million for research. It launched the Framework for its work in July 2008¹⁵ and by the end of 2008 involved a team of 27 staff. Further expansion of the budget and staff is planned, with the team expected to have up to 37 members of staff by December 2009. For 2009-2010 the Programme budget allocation is just under £2 million, and the research budget just under £7 million.

Providing the evidence base

2.9 The Government aims to develop the evidence base for the National Adaptation Programme required by the Climate Change Act 2008 by publishing updated projections of future climate change, the UK Climate Projections 2009, and through the work to develop the UK Climate Change Risk Assessment, which is also required under the Act. The Government's aim is to build on previous work to provide more robust and comprehensive evidence about the risks of climate change for different regions and sectors, to help prioritise government action on adaptation, and help individuals and organisations make effective decisions on how to adapt.

UK Climate Projections 2009

2.10 The June 2009 'UK Climate Projections 2009' (the Projections) provide probabilistic information on future climate change up to 2099 over both land and sea. The Projections update the last scenarios from 2002 and were funded by the UK Government at a cost of around £11 million. They were produced by a consortium of organisations including UKCIP, Met Office Hadley Centre, British Atmospheric Data Centre and Newcastle University.¹⁶

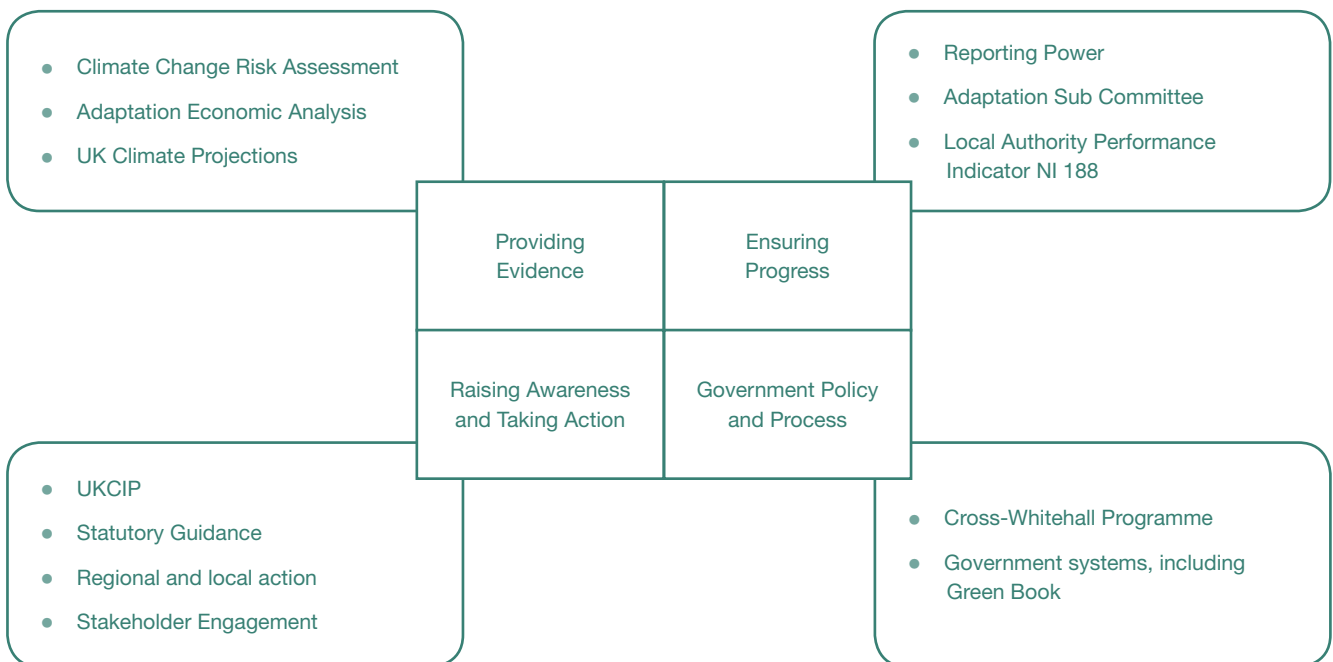
¹⁵ Department for Environment, Food and Rural Affairs (2008) *Adapting to Climate Change in England: A framework for action*.

¹⁶ Department for Environment, Food and Rural Affairs (2009) *Adapting to climate change: UK Climate Projections*.

2.11 For the first time the Projections explicitly account for the uncertainties in future climate change, by providing probabilities for different climate outcomes under three different emissions scenarios, based on the strength of evidence provided from current knowledge, climate modelling and expert judgment.¹⁷ These probabilities attempt to capture the scientific uncertainty associated with projecting future climate and give decision makers information on which climate changes are most consistent with current evidence and also what range of potential outcomes should be considered. Some decisions will need to focus on the most likely outcomes, but for others, particularly where large investments or critical national infrastructure is involved, the full range of possibilities is relevant. Data is also provided at much greater spatial resolution than previous scenarios.

Figure 4

The workstreams in the ACC Programme



Source: National Audit Office, based on information from the ACC Programme

¹⁷ Department for Environment, Food and Rural Affairs, 2009 *Adapting to climate change: UK Climate Projections*.

2.12 The ACC Programme hopes the Projections will be a catalyst for work on adaptation and used in risk assessment and decision-making, but they are much more complex to understand and use than previous scenarios. A scoping report for the UK Climate Change Risk Assessment, produced by consultants for the ACC Programme, suggested that providing information at such detailed spatial resolution with specified uncertainties might lead to decision makers seeing the Projections as more certain than they are.¹⁸

2.13 To help users understand the Projections, the ACC Programme and UKCIP are planning extensive training and support, including substantial web-based support and guidance, interfaces for using the data and a programme of national and regional training events after the launch.¹⁹ We found Departments were aware of the value of the Projections and had active plans to use them, were planning relevant training or seminars, or at least wanted to investigate potential uses. Departments that were at relatively early stages in their work on adaptation plan to use the Projections to develop scoping work on relevant risks – for example, the Department for Culture, Media and Sport (DCMS) has commissioned research to use the new Projections to identify the risks relevant to their remit. Departments such as Defra that are more advanced were able to give numerous examples of their policy teams' or sponsor bodies' plans to use the Projections.

The Climate Change Risk Assessment

2.14 The Climate Change Act 2008 requires the first Climate Change Risk Assessment (CCRA) to be reported within three years of the Act coming into force (i.e. by 26 January 2012), and thereafter for one to be undertaken every five years. The Government's aim is for the CCRA to identify, assess, and where possible monetise the key climate change risks and opportunities at UK, national and regional level to inform government policy and spending.²⁰ It will be accompanied by an associated economic analysis to improve understanding of the costs and benefits of adaptation measures; to give an overall indication of the scale of the challenge; and to help identify priority areas for action. The associated Adaptation Economic Analysis is not a requirement of the Act and so will report some six months after the CCRA. The bulk of the work for the CCRA and the Adaptation Economic Analysis will be contracted out to consultants and academic experts. This contract is currently under tender to be awarded by September 2009 and is expected to cost between £1-2 million.

18 Metroeconomica, AEA and Paul Watkiss Associates (2009) *Scoping Study for a National Climate Change Risk Assessment and Adaptation Economic Analysis: Final Report*.

19 See <http://ukclimateprojections.defra.gov.uk/> website for more information on the Projections, including training and support.

20 Department for Environment, Food and Rural Affairs (2009) *UK Climate Change Risk Assessment: Invitation to Tender*.

2.15 The CCRA will assess the potential impacts from climate change, using the latest Projections, across different sectors and regions, to identify the highest priority risks to the UK. It will assess the severity of the potential risks through combining understanding of these impacts across sectors with an assessment of their current and future vulnerability and capacity to adapt. The CCRA will not produce a detailed assessment of the risks in any one sector, project or locality, and therefore does not replace the need for others to undertake their own detailed risk assessment work on climate change impacts as they affect their own sectors.

2.16 The first CCRA needs to be delivered to a tight timescale and so the ACC Programme's aim is for it to develop an appropriate analytical framework, identify evidence gaps, prioritise research and create the platform on which future assessments can build. The ACC Programme considers that the first CCRA must develop understanding of the relationship between changes in climate and the resulting impacts at a sector level; account for the inherent uncertainty in predicting future climate change; combine and build on a wide range of existing research and methodologies; and attempt to quantify the costs and benefits of potential adaptation options.²¹ The ACC Programme considers that the CCRA and associated Adaptation Economic Analysis are challenging and complex undertakings, with both methodological and conceptual difficulties, and will involve difficult decisions on what work to prioritise for the first assessment. The ACC Programme emphasises that it will be the first in a rolling cycle of national risk assessments, rather than a definitive assessment of all risks.

2.17 The CCRA is being prepared with input from a large steering group, and will be subject to external scrutiny by the Adaptation Sub-Committee (ASC). The steering group for the CCRA includes a wide range of stakeholders including UK Government Departments and Agencies, Devolved Administrations, Regional Development Agencies, and industry. Under the Act the ASC is required to provide its formal advice on the CCRA six months before the CCRA's final publication. Defra plans to inform the ASC of the development of the CCRA as the work progresses, so the ASC can provide advice during its development.

21 Metroeconomica, AEA and Paul Watkiss Associates (2009) *Scoping Study for a National Climate Change Risk Assessment and Adaptation Economic Analysis: Final Report*.

Raising awareness, and helping others to take action

2.18 Developing the evidence base will only be effective if it is used properly and key organisations nationally, regionally and locally are aware of the need to assess climate change risks and adapt. Local and regional level action will be particularly important, due to the variation of impacts across the UK and local vulnerabilities. In addition to funding and launching the UK Climate Projections, the ACC Programme aims to raise awareness and help others to take action, through supporting:

- the work of the UK Climate Impacts Programme (UKCIP); and
- work at the regional and local level, primarily through its Local and Regional Partnership Board.

UK Climate Impacts Programme

2.19 UKCIP provides a range of tools and guidance to help others understand the possible impacts of climate change, including its collaborative work on the UK Climate Projections, an Adaptation Wizard to guide users through the first stages of thinking about adaptation, advice on risk-based decision making, and a database of adaptation case studies. UKCIP has worked with regional partnerships and sectors to consider their key adaptation challenges.

Work with Regional and Local Partners

2.20 The Local and Regional Partnership (LRAP) Board aims to facilitate action on climate change adaptation at a local and regional level by highlighting best practice, enhancing skills, providing toolkits and encouraging joint working between local and regional agencies. In 2008-2009, Defra provided £130,000 to the Board for projects to support local and regional adaptation delivery, and has committed a further £150,000 in 2009-2010, with additional funding in 2010-2011. Local Authorities will have a key role in adaptation as providers of frontline services to local communities. Therefore, a key priority for the LRAP Board is providing support to Local Authorities to deliver against the local government performance indicator for adaptation, NI 188, through developing guidance and facilitating sharing of best practice. NI 188 will be discussed further under paragraph 2.35 on ensuring and measuring progress.

2.21 Members of the LRAP Board working with local authorities on adaptation include amongst others, UKCIP, Environment Agency, Natural England, the Local Government Association and the Improvement and Development Agency for Local Government (IDeA). There are also a number of regional organisations with an interest, or role, in adaptation represented on the LRAP Board, including:

- Regional Climate Change Partnerships, independent regional stakeholder groups working on adaptation to which Defra now provides some funding (around £450,000 in 2008-2009).

- Government Offices, which represent central government policy regionally and have built up a network of adaptation leads regionally, with the aim of building adaptation knowledge and capacity.
- Regional Development Agencies, which are involved in the Regional Climate Change Partnerships and will be responsible for developing regional strategies, that will need to consider adaptation.
- Regional Improvement and Efficiency Partnerships (RIEPs), which have been given around £4 million by Defra and the Department for Communities and Local Government (CLG) to fund a climate change best practice programme, some of which may be spent on adaptation work. IDeA is the national coordinator for the programme, supporting the RIEPs and leading the development of nationally delivered projects under the programme.

Embedding adaptation in Government policy and process

2.22 The ACC Programme recognised at its launch that “there was a long way to go until all Government programmes routinely consider climate change risks at policy and delivery stages, and are planned accordingly”.²² The ACC Programme aims to embed adaptation into government processes and systems; ensure key government programmes are considering adaptation; and ensure that priorities for action are being addressed.

Embedding adaptation into government processes and systems

2.23 The ACC Programme has developed new guidance to help government address adaptation in policy and investment appraisal and decision making processes. This was published alongside the launch of the UK Climate Projections in June 2009 as supplementary guidance to HM Treasury’s *Green Book: Appraisal and Evaluation in Central Government*.

2.24 This supplementary guidance – *Accounting for the Effects of Climate Change* – provides general guidance, rather than detailed methodologies, for appraising the costs and benefits of measures to address climate change impacts. It includes advice to Departments on when it is particularly relevant to consider climate change risks and adaptation actions; how to identify the potential risks and generate options to address them; and how to appraise these different options and then monitor and evaluate outcomes. The ACC Programme plan to review Departments’ use of the guidance in 2010.

²² Department for Environment, Food and Rural Affairs (2008) *Adapting to Climate Change in England: A framework for action*.

2.25 The guidance gives some specific advice to Departments on how to design options to address risks despite the uncertainty associated with future climate change. These include incorporating flexibility into design, allowing for adjustment in future to cope with effects that are more or less severe than anticipated; increasing resilience through designing projects to tolerate a wider range of climate conditions; identifying measures that would be beneficial for current climate, or cost little to implement; and considering the benefits of delaying certain decisions until more information is available.

2.26 The ACC Programme has proposed other projects to embed adaptation into government systems, but these have not yet been progressed substantially. They plan to address:

- **Public Procurement**, working with the Office of Government Commerce (OGC) to produce guidance in early 2010 setting out why and how climate change adaptation should be incorporated within public procurement.
- **Making the Government estate resilient**, working with OGC and all Departments to assess climate change risks to the Government estate and what might be done to increase its resilience. The ACC Programme and OGC are currently considering how best to monitor Departments' progress on adapting their estates, and the most appropriate mechanism for doing so.

2.27 Other future work may include, for example, looking at the role of Impact Assessments and whether, and how, adaptation could be embedded within these.

Embedding adaptation in key Government programmes

2.28 The ACC Programme aims to work with government Departments to help them embed adaptation in their work, through the sharing of best practice and more formal monitoring of their progress.

2.29 Cross-sectoral, and therefore cross-departmental, issues are widely agreed to be important for adaptation, requiring effective partnership working and coordination both between Departments and with other bodies. For example, in policy areas such as critical national infrastructure, flooding, planning and emergency response there are multiple departmental and local responsibilities that interact and need to be coordinated. Our survey found that the cross-government approach of the ACC Programme is valued by Departments as important for sharing knowledge and best practice, and also for developing cross-departmental understanding of risks and policy responses.

2.30 In the first year of the ACC Programme there was no formal routine monitoring of adaptation work across Departments, as the focus was on raising awareness and understanding. The ACC Programme has published an update of progress in key priority areas, however, as part of its launch of the Projections,²³ and also has a section of its website that sets out action and priorities on adaptation for each Department.²⁴ There are now plans to improve the collation of information on Departments' work so that it can be reported systematically to the Programme Board. In June 2009 the government committed Departments to publishing high-level Departmental Adaptation Plans for spring 2010, to provide information on individual Departments' priorities and progress. The Adaptation Sub-Committee (ASC) has a statutory role to advise the ACC Programme on the CCRA and to monitor Government's progress in implementing the statutory National Adaptation Plan, with a statutory duty to report to Parliament every two years once the National Adaptation Plan is in place (from 2012).

Priorities for action

2.31 During 2008-2009, the ACC Programme has been working with Departments to identify risks where action needs to be taken now without waiting until the evidence base is further developed. Key priorities for the ACC Programme are to incorporate consideration of climate change risks in long term investment decisions. The ACC Programme is currently developing detailed criteria to help determine priorities in Departmental Adaptation Plans.

2.32 The ACC Programme has prioritised work to ensure that water, energy and transport infrastructure is resilient to the long term risks from climate change (i.e. over 20 to 90 years). A project on 'Infrastructure and Adaptation' started in 2009 with a two-year timeframe and a budget of £200,000 for the first year. It is a cross-government project, chaired by the Department for Transport (DfT) and managed by a member of Defra's ACC Programme team. Members include the joint DfT and the Department for Business, Innovation and Skills (BIS) chief scientist, and senior representatives of the Highways Agency and other Departments such as the Cabinet Office, DECC, BIS, CLG and Defra.

2.33 The project will focus on overcoming barriers to addressing long term climate impacts, including those around awareness, financing, regulation, design, engineering, and policy. The project will work alongside Cabinet Office work, which addresses contingency planning and risks from natural hazards over shorter timescales. A scoping study is currently under way to better understand the transport, energy and water sectors and the current regulatory and investment framework. Work will then focus on understanding the technical risks and operational implications to infrastructure from long term climate change, working with the engineering community to improve technical capacity, and examining how to overcome potential barriers to adaptation such as regulation and finance. The ACC Programme team will also be engaging with the Infrastructure Planning Commission on consideration of adaptation in planning decisions for major infrastructure.

²³ Department for Environment, Food and Rural Affairs (2009) *Adapting to climate change: UK Climate Projections*.

²⁴ Department for Environment, Food and Rural Affairs (2009) *Adaptation across Government*. Available at <http://www.defra.gov.uk/environment/climatechange/adapt/programme/across-government.htm>

Ensuring and measuring progress

2.34 Measuring progress on adaptation, particularly in outcome terms, is difficult: outcomes may not be seen and measurable for 30-50 years, and most of the current effort is around building adaptive capacity which is hard to define and measure. The ACC Programme aims to develop a suite of indicators for adaptation, but this work is at an early stage. It has incorporated an indicator for adaptation into the local government performance framework (NI 188); and it is developing a strategy for use of the new statutory Reporting Power, for requiring public bodies or 'statutory undertakers' (e.g. utility companies) to report on how they have assessed and are addressing the risks of climate change.

Measuring local government progress on adaptation

2.35 Unlike most indicators in the local government performance framework, NI 188 on adaptation is process-based rather than an outcome measure. It reports local authorities' self-assessment of their progress in identifying climate change risks and priorities through to developing and managing an adaptation action plan. All English local authorities have to report against the indicator, and 56 local authorities have included NI 188 in their Local Area Agreement and set themselves specific targets. The first results are expected in summer 2009. To learn lessons from the first year of its use, the ACC Programme has commissioned a review of the indicator and the self-assessment process to take place over summer 2009.

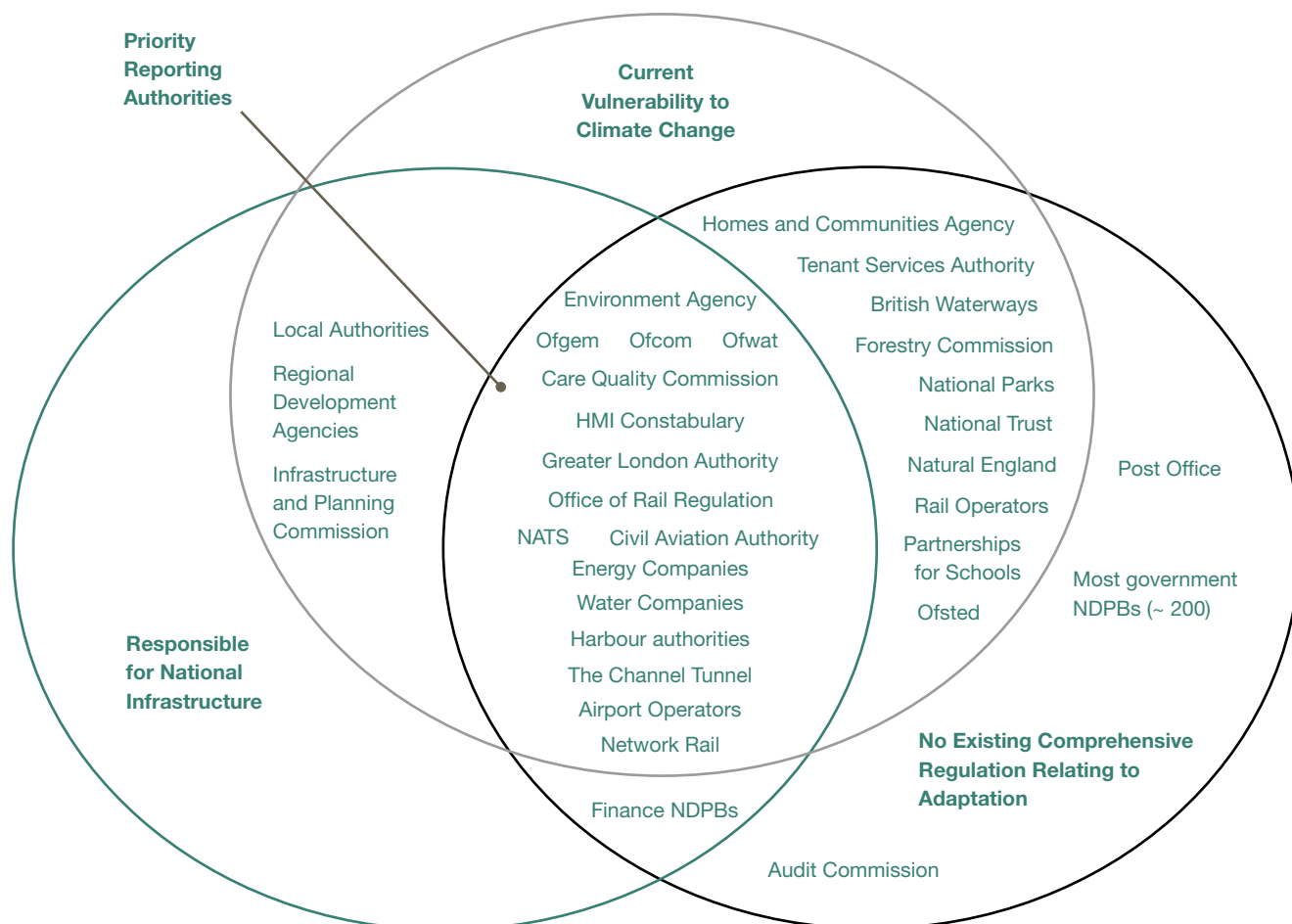
Use of the Reporting Power

2.36 The Reporting Power, established under the Climate Change Act 2008, gives the Government a lever to influence adaptation work across the public sector. The Climate Change Act 2008 gives the Secretary of State the power to direct public bodies and statutory undertakers, such as energy or water suppliers, to produce reports on their assessment of current and future predicted impacts of climate change on their functions; their proposals and policies for adapting to climate change; and their assessment of their progress. The Act committed the Government to lay before Parliament a strategy for the use of this power by 26 November 2009 and Government may also publish statutory guidance for those asked to report. The reporting authority must by law have regard to the statutory guidance when preparing its report and have regard to its own report in exercising its functions. The ACC Programme is currently consulting on its strategy for use of the Reporting Power, and draft statutory guidance.²⁵

²⁵ Department for Environment, Food and Rural Affairs (2009) *Adapting to Climate Change: ensuring progress in key sectors. Consultation on the Adaptation Reporting Power in the Climate Change Act 2008.*

2.37 The Government has proposed that 103 priority organisations should be asked to report in 2010, out of over a 100,000 reporting authorities potentially covered by the terms of the Act. The priority organisations include the Environment Agency, the Care Quality Commission, water, energy and sewage companies, regulators and transport bodies such as Network Rail, selected because of their responsibility for national infrastructure; vulnerability to the projected impacts of climate change; and in the absence of an existing regulatory framework to address adaptation (**Figure 5**).

Figure 5
Strategy for selecting who will be asked to report



Source: ACC Programme consultation on the Reporting Power¹

NOTES

¹ This diagram has been taken from the current ACC Programme consultation on the use of the Reporting Power. Department for Environment, Food and Rural Affairs (2009), *Adapting to Climate Change: ensuring progress in key sectors – Consultation on the Adaptation Reporting Power in the Climate Change Act 2008*. Available at: <http://www.defra.gov.uk/corporate/consult/climate-change-adapting/index.htm>.

2.38 In addition, the Government has proposed to invite selected organisations not covered by the Reporting Power to report. These are organisations which meet the Government's criteria and which the Government considers should publicly report their plans and progress in addressing adaptation. These include companies in the food sector, electronic communications companies, petroleum companies and government bodies such as Forestry Commission, Natural England and the Highways Agency.

2.39 The draft statutory guidance sets out generic guidelines as to how to undertake an assessment of the risks from climate change, and what types of responses might be appropriate. Given the diversity of bodies and sectors covered by the Reporting Power, it does not propose a 'one size fits all' approach to guidance. The first reports are expected to be returned in 2011.

2.40 The consultation proposes that the ACC Programme should analyse the quality of the reports, and that the Adaptation Sub-Committee might be given a role in analysing preparedness across each sector. The consultation does not set out criteria for analysing the reports and judging whether authorities are adequately having regard to their reports in the exercise of their functions. The ACC Programme is currently considering how to address this issue.

Part Three

Departments' current assessment of risks from climate change impacts

3.1 While the Adapting to Climate Change Programme is identifying priorities for cross-government action, Departments are individually responsible for identifying, assessing and addressing the risks from future climate change impacts to their business. Assessing the risks from future climate change impacts is not straightforward, as the projected climate changes are uncertain, will occur over long timescales and could have a number of direct and indirect impacts. This review asked Departments to identify and assess the significance of the most important risks to their objectives from climate change impacts and to report how they are responding to these risks. Responses to these risks can vary from actions to reduce vulnerability to specific climate change impacts through to actions that build capacity to adapt through research, raising awareness or publishing guidance. Summaries of the responses provided by each Department to the risks they identified are set out in Appendix 3.

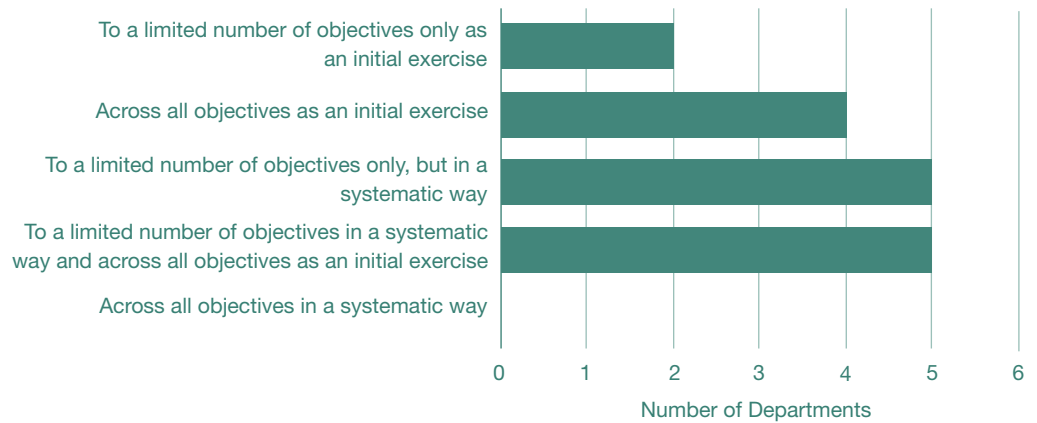
Risks to departmental objectives and responses

3.2 All Departments have begun to identify potential risks to their objectives, but most have at least initially focused their work on assessing risks to a limited number of their objectives (**Figure 6** overleaf). Six Departments have undertaken only an initial exercise so far, and for two of these it was only across a limited number of objectives. The Department for Work and Pensions (DWP) is a notable example of having undertaken a systematic approach to initial scoping work, having commissioned research to highlight potential risks across its objectives, which it now intends to build on to assess the significance of these risks.

3.3 Most of the Departments which were in a position to assess the significance of risks have concluded they are potentially significant to some of their objectives, whereas Defra considers climate change risks to be significant threats to all of its Departmental objectives (**Figure 7** overleaf). In general, Departments felt that climate change risks would become more significant in the medium to long term. Four Departments (BERR, DCMS, HM Treasury and DWP) had not yet determined the significance of the risks to their objectives. DCMS and DWP have research either under way or planned to address this and HM Treasury are conducting further internal work.

Figure 6

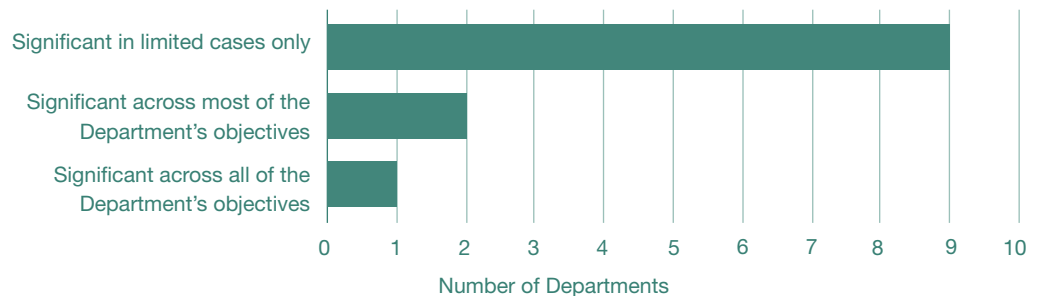
Departmental progress in assessing risk to objectives



Source: National Audit Office survey of government Departments

Figure 7

Departmental assessment of the significance of climate change risks to the delivery of objectives



Source: National Audit Office survey of government Departments

3.4 Departments identified a wide range of risks to their objectives arising from the impacts of climate change, and provided examples of their responses to date. These risks fall within five broad sectoral groups:

- **Business and the economy** – risks to economic performance of the UK.
- **Infrastructure** – risks to critical national infrastructure (including energy, water supplies and transport) and other large-scale infrastructure such as sports venues.
- **Agriculture, food security and the natural environment** – risks to biodiversity, agricultural services, the natural environment and the provision of reliable and affordable food supplies.
- **Homes and buildings (including government estate)** – risks to public and private buildings.
- **Public health** – risks to health and the provision of health services.

Flooding and coastal erosion give rise to a number of risks that cut across these groups. For example, risks relating to infrastructure, the costs of providing adequate flood defences, emergency planning and emergency services and risks to coastal communities. The risks and examples of actions taken so far are set out in **Figure 8** overleaf and Paragraphs 3.5 to 3.20.

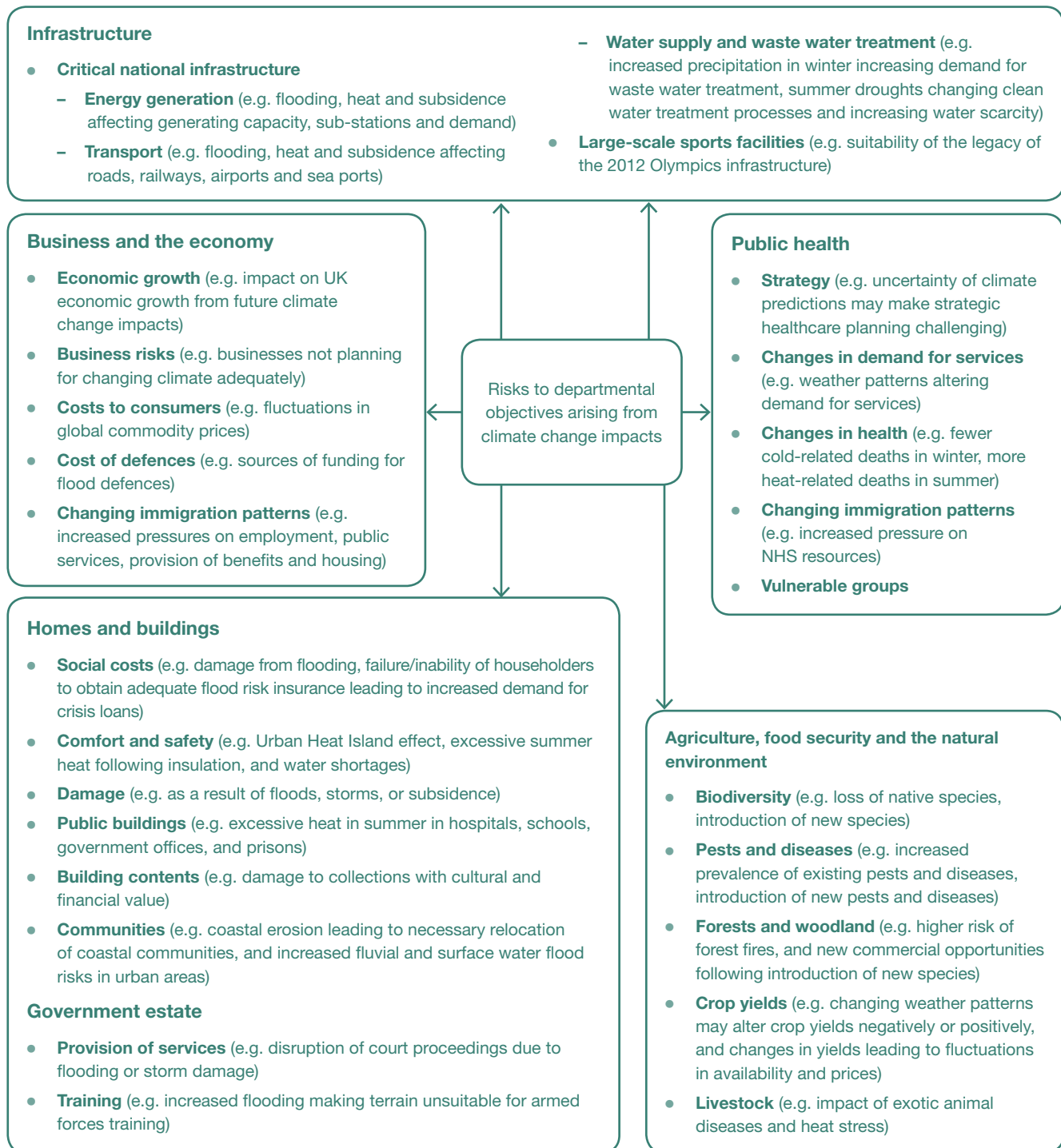
Flooding and coastal erosion

3.5 Most Departments identified at least one risk presented by flooding, highlighting the importance, and perhaps also past experience, of dealing with this particular type of event, which is likely to become more severe and frequent with climate change. Total government funding for providing flood and coastal erosion risk management over the three years of the 2008-2011 Spending Review is just over £2 billion.²⁶ The Environment Agency estimates that in 2009 one in six homes in England are currently at risk of flooding; and that the potential cost of providing adequate flood defences to current standards of protection is also likely to double to £1 billion per year by 2035, excluding inflation.²⁷ Both Defra and CLG highlighted the need for a public debate on the source of funding for such flood defences. DWP also identified the potential risk to the economy as a result of extreme weather if householders do not, or cannot, obtain adequate insurance and the potential for this to lead to an increase in demand for crisis loans. DWP intends to develop its initial adaptation scoping study to include plans to deal with this and other risks following the publication of the UK Climate Projections 2009.

²⁶ Department for Environment, Food and Rural Affairs (2009) *Adapting to climate change: UK Climate Projections*.

²⁷ Environment Agency (2009) *Investing for the future – Flood and coastal risk management in England – A long-term investment strategy*.

Figure 8
Climate change impacts and risks identified by Departments



Source: National Audit Office, based on survey of government Departments

3.6 Increasing resilience to current climate variability can be one approach to starting work on adapting to climate change. The drive to improve flood risk management has not only come from consideration of the need to adapt to future climate change, but also from addressing vulnerabilities exposed through recent flood events such as those of summer 2007. Many Departments referred to actions being taken to implement the recommendations of the Pitt Review, which sought to learn lessons from these floods.²⁸ The implications of future climate change are also being explicitly considered by the Environment Agency and local authorities in their long term flood and coastal risk management strategies. In a major project to examine the future of flood protection for London and the Thames Estuary until 2100, the Environment Agency is incorporating uncertainties by identifying thresholds (e.g. the extent of sea level rise), which if reached, would mean different decisions would need to be taken about how to upgrade the Thames Barrier and other flood defences.²⁹

3.7 CLG identified the risk that emergency services may not be adequately prepared to respond to the increased demand for their services as extreme weather events, such as flooding, become more frequent. CLG reported that fire and rescue services risk management processes should allow these services to identify risks such as those from climate change impacts, and provide equipment, personnel and training as appropriate. High volume pumping units funded by CLG through the Government's New Dimension programme are now available across the country to respond to major flooding incidents.

3.8 The impact of coastal erosion and sea-level rises were also identified as a particular risk for new and existing coastal communities by CLG. The Department identified various planning policies and guidance that have incorporated adaptation and are intended to mitigate against increased risks of flooding to communities. Defra, in collaboration with other Departments, has recently launched a consultation on Coastal Change Policy which is designed to seek the views of people who live and work in coastal communities on how communities can adapt to the challenges of coastal change and how Government proposes to support these communities in doing so.³⁰

Infrastructure

3.9 The potential scale of the impacts of climate change on critical national infrastructure, particularly relating to energy, transport and water, was highlighted during the floods of summer 2007. The response provided by DECC identified two ways in which climate change impacts present risks to its objectives. Firstly, increased rainfall and subsequent flooding may lead to interruption to, or in extreme cases the loss of, major electricity, gas or oil infrastructure. The energy sector has developed a methodology for identifying these risks and is now working with its regulator, Ofgem, on ways to mitigate them. The Department also recognises that there are potential risks to

²⁸ The Pitt Review (2007) *Learning Lessons from the 2007 Floods*.

²⁹ Environment Agency (2009) *Managing flood risk through London and the Thames estuary: TE2100 Consultation Document*.

³⁰ Department for Environment, Food and Rural Affairs (2009) *Consultation on coastal change policy*. Available at <http://www.defra.gov.uk/corporate/consult/coastal-change/index.htm>

energy generation from longer periods of higher temperatures and drier conditions and is working with the Energy Emergencies Executive Committee, a joint government and industry emergency planning body, to improve understanding of these risks and then manage their implications. Energy demand will also be affected by a changing climate, with potentially lower demand during milder winters but potentially higher summer demand for cooling. The Department stated that energy companies are reviewing the situation and that it will ensure these companies are aware of the latest Projections.

3.10 DfT identified several risks to national transport infrastructure arising from climate change impacts. Higher temperatures may cause roads, pavements and runways to melt, rail tracks to buckle, and passenger safety and comfort to be compromised. In response to these risks the Highways Agency has amended the specifications to which roads are built and maintained to ensure they can withstand higher temperatures. The Department is working with the rail industry to develop track specifications designed to withstand higher temperatures. Increased rainfall also presents risks to transport infrastructure including flooding of roads and rail tracks, subsidence of embankments and landslides on to roads and rail tracks. The Highways Agency and rail industry are looking at how they can improve the drainage of roads and rail tracks to reduce future risks of flooding.

3.11 For future planning of nationally significant infrastructure projects, National Policy Statements are required to consider the need to mitigate and adapt to climate change and will provide a decision making framework for the new Infrastructure Planning Commission. Departments are expected to publish the first tranche of National Policy Statements³¹ for public consultation and Parliamentary Scrutiny in autumn 2009 with the remaining four National Policy Statements being produced on a longer timeframe.³² The Infrastructure Planning Commission is expected to be ready to receive applications from the energy and transport sectors from 1 March 2010.³³

Public health

3.12 Most efforts in relation to public health focus on protecting the public from the effects of heat. In 2008 the Department of Health (DH) and the Health Protection Agency published analysis of the health effects of climate change and DH publishes national heat wave plans, the most recent of which was published in May 2009. DH considered it may face a challenge in balancing a response to the impacts of climate change with the provision of health services in relation to other risks. CLG has also identified the impact of high summer temperatures on the health and welfare of the occupants of homes and office buildings as one of the risks it needs to manage through Building Regulations.

³¹ The first tranche of National Policy Statements covers the nuclear power, renewable energy, electricity networks, fossil fuel generation, oil and gas infrastructure, ports, and national networks (road and rail) sectors.

³² The remaining four National Policy Statements cover the waste water, hazardous waste, airports and water supply sectors. The full timetable for National Policy Statements, and descriptions of those planned, can be found in Department for Communities and Local Government (2009) *Infrastructure Planning Commission Implementation Route Map – July 2009*.

³³ Ibid.

3.13 DH also referred to the impact of floods on public health. In response to the Pitt Review of the 2007 summer floods, DH and the Health Protection Agency have developed flooding guidance and are working towards implementing the recommendations of the Review.

Agriculture, food security and the natural environment

3.14 The agriculture and land management sector plays an important role in the economy of the UK, and uses three quarters of the UK's land area.³⁴ Defra and the Forestry Commission identified several threats to it from climate change, and the challenge of raising awareness of disease threats and increasing the resilience of the country's tree stocks. The Cabinet Office also identified the potential impact of climate change on crop yields and resulting food price and availability issues, which would have a widespread impact on the economy.

3.15 Defra reported that it may have to deal with changes in habitat space available for wildlife. Loss and changes to habitats could have negative impacts on biodiversity and ecosystems on both land and water. In particular, Defra identified that although understanding of the potential impacts of temperature changes and ocean acidification is still developing, the consequences could be significant. In response, the Department published a strategy intended to help conserve biodiversity in a changing climate. Protection of marine and coastal biodiversity will be covered in the Marine and Coastal Access Bill. Defra is also carrying out several research projects including modelling the impact of various climate scenarios on species, and a national assessment of the current state of all ecosystems across the UK. As custodians of significant amounts of land, the Ministry of Defence (MoD) also raised the potential impacts of climate change on its organisational commitments to protect biodiversity.

3.16 The Forestry Commission identified that climate change coupled with increased global trade in timber products could lead to catastrophic increases in pests and diseases that may threaten woodlands and forestry production. In response to this risk, the Commission has tasked Forest Research (the Commission's Research Agency) to undertake a review of the threats of pests and disease and identify alternative species of trees that could be used in commercial forestry production.

Homes and buildings

3.17 The risks posed to homes and buildings, their occupants and contents of significant cultural or financial importance include damage and associated costs of flooding and storm damage, comfort and safety issues as a result of increased summer temperatures, water scarcity and disruption to services. In response to the risks, CLG is focusing its efforts on incorporating adaptation into the planning system, building standards and requirements for social housing (including requiring builders to consider heat gains as well as heat losses for domestic buildings, and new water efficiency standards for homes).

³⁴ The Department for Environment, Food and Rural Affairs Farming website: <http://www.defra.gov.uk/farm/index.htm>

3.18 Most Departments responding to our survey referred to the impact of climate change on buildings within their specific remits, including social housing and public buildings, such as schools. For example, changes to weather patterns have the potential to affect many of the children's services provided by the Department for Children, Schools and Families (DCSF). In particular, the Department believes that increases in summer temperatures may lead to schools becoming overheated and new and refurbished schools will need to allow for resilience to overheating. The Ministry of Justice (MoJ) drew attention to the impact of flooding on its delivery of court proceedings. As a result, all new and refurbished courts are required to have floor levels that are above the height of the one in 200 year return flood risk level, plus an additional 20 per cent to account for climate change.

Business and the economy

3.19 HM Treasury believes that the long term implications of future climate change impacts are very significant for the UK, particularly when considering impacts as a result of climate change around the world, as set out in the Stern Review. However, it currently finds it difficult to judge the relative significance of climate change impacts compared to other potential long term impacts on the economy. The extent of the consequences of climate change impacts will depend on the extent of future climate change, whether adaptation measures are adopted and the costs of these measures. Other Departments identified a variety of specific risks relating to the economy ranging from impacts increasing energy costs, fluctuations in global prices for commodities to wide-ranging risks to the UK economy.

3.20 The Home Office has also identified risks relating to immigration to the UK, both legal and illegal, as a result of international climate change impacts making other parts of the world less habitable. The range of potential impacts includes increased pressure on public services and resources, illegal working, increased asylum claims, and the inability to return people to certain countries. The Home Office is working with the Government Office for Science on a Foresight project on global migration due to environmental change to better understand these risks and prepare for them.

Part Four

Departments' self-assessment of their capacity to assess and manage climate change risks

4.1 The ability of Departments to manage the delivery of their objectives in the long term will depend on their ability to identify, assess and manage the risks that arise from the impacts of future climate change. This review asked Departments to undertake a self-assessment of their current capacity to assess and manage climate change risks in April 2009, using a model based on established principles of effective risk management.³⁵ Departments were asked to score themselves against five levels of progress (**Figure 9**) in relation to their:

Leadership – the extent to which senior departmental management support and promote assessment and management of climate change risks;

Policy and strategy – the clarity of their departmental strategy for assessing and managing climate change risks;

People – the extent to which departmental staff are equipped and supported to manage climate change risks;

Partnerships – the development of arrangements for managing climate change risks with other organisations such as sponsored bodies, private finance contractual partners, suppliers, local/regional government, and other Departments; and

Processes – the extent to which Departments have implemented effective processes to deal with climate change risks in areas such as impact assessments, policy making, programme management and operations (e.g. estates management and procurement).

Figure 9

Levels of progress in developing capacity to assess and manage climate change risks



Source: National Audit Office model based on HM Treasury Risk Assessment Framework

³⁵ NAO developed this model based on HM Treasury's Risk Assessment Framework (HM Treasury (2004) *Risk Management Assessment Framework: A tool for Departments*).

Overview of results of Departments' self-assessments

4.2 Climate change adaptation, and consideration of climate change risks, is a relatively new issue for most Departments, and the vast majority of Departments assessed their capacity to identify and manage climate change risks across all themes as 'Getting Started', having 'Awareness and Understanding' or having 'Implementation Planned and in Progress'. No Departments assessed their capacity as 'Embedded and Improving' across all themes, which means that climate change risks are not yet being managed strategically and consistently throughout any Department. Departments' assessments may in part reflect their awareness of the scale of the challenge in truly embedding the management of climate change risks in their activities.

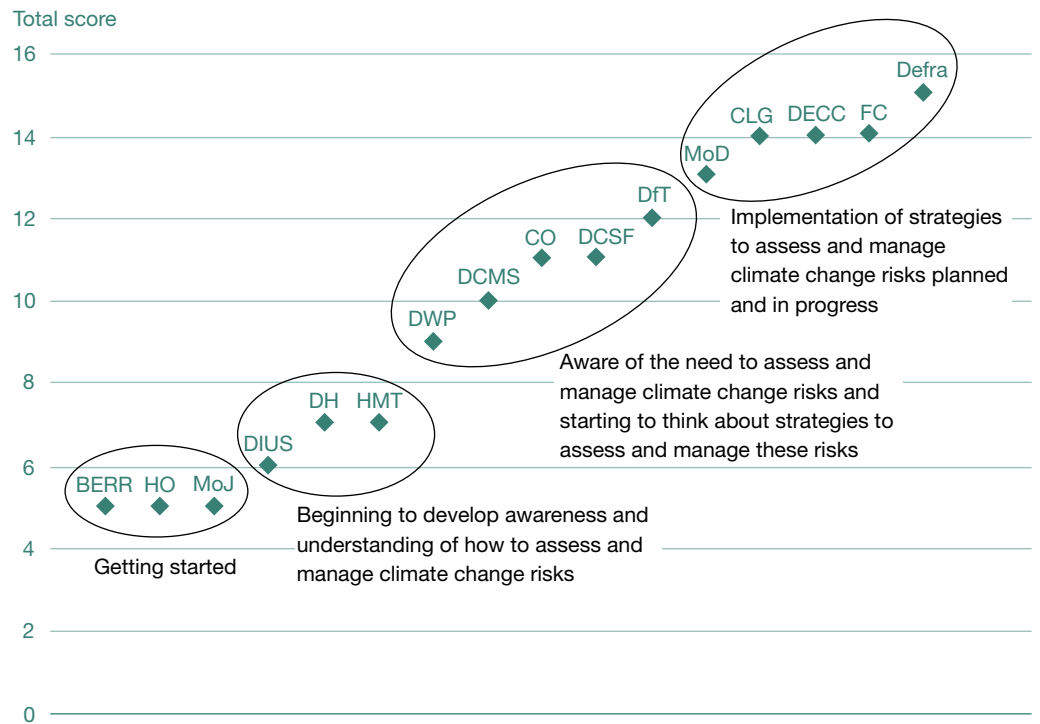
4.3 Departments can be broadly grouped into four categories by converting their self-assessment responses into an indicative score which reflects their overall capacity to assess and manage climate change risks (**Figure 10**).

4.4 CLG, Defra, DECC, MoD and the Forestry Commission, which have scored themselves at the higher end of the self-assessment, have all already been affected by more obvious or pressing priorities associated with long term climate change, or extreme weather events and are aware of the need to build their capacity for addressing climate change impacts. For example, both Defra and CLG have dealt with flood risk management and surface water flooding in recent years and implications for investment, planning, emergency services and recovery. Defra in particular has an inherent focus on environmental risk and has the lead role for the ACC Programme. DECC has overall responsibility in Government for climate change mitigation and international negotiations on climate change, both mitigation and adaptation. The Forestry Commission has to plan on long timescales to manage and maintain forests and so climate change adaptation is a current operational issue. The MoD sees international climate change as a major risk to security (an international issue beyond the remit of this report), but also recognises that its large and complex estate and operational functions could be affected by climate change risks.

4.5 The Departments which have scored themselves as 'Getting Started' in building capacity to assess and manage climate change risks include BERR, whose principle focus has been on climate change mitigation policies, and has recently been affected by organisational change. The Home Office and MoJ, who also score themselves as 'Getting Started' have only experienced minor impacts to date from climate change (either mitigation or adaptation). Both Home Office and MoJ acknowledge that climate change related impacts are likely to become more significant considerations for them in the future. The MoJ also highlighted that its assessment was an overall assessment for the Department as a whole, and some parts, such as Her Majesty's Court Service which has already implemented some measures to manage risks from future climate change (as highlighted in Paragraph 3.18), would rate themselves individually as more advanced.

Figure 10

Departmental self-assessment of current capacity to assess and manage climate change risks



Source: National Audit Office survey of government Departments

NOTES

The relative position of different Departments reflects their own self-assessments, which have not been subject to independent validation. Departments' self-assessments may not be fully consistent or comparable if they have reached different interpretations of the meaning of the self-assessment framework.

The Department for Business, Enterprise and Regulatory Reform (BERR) and the Department for Innovation, Universities and Skills (DIUS) responded to our survey as separate Departments and so are reported separately, although both are now part of the newly formed Department for Business, Innovation and Skills (BIS).

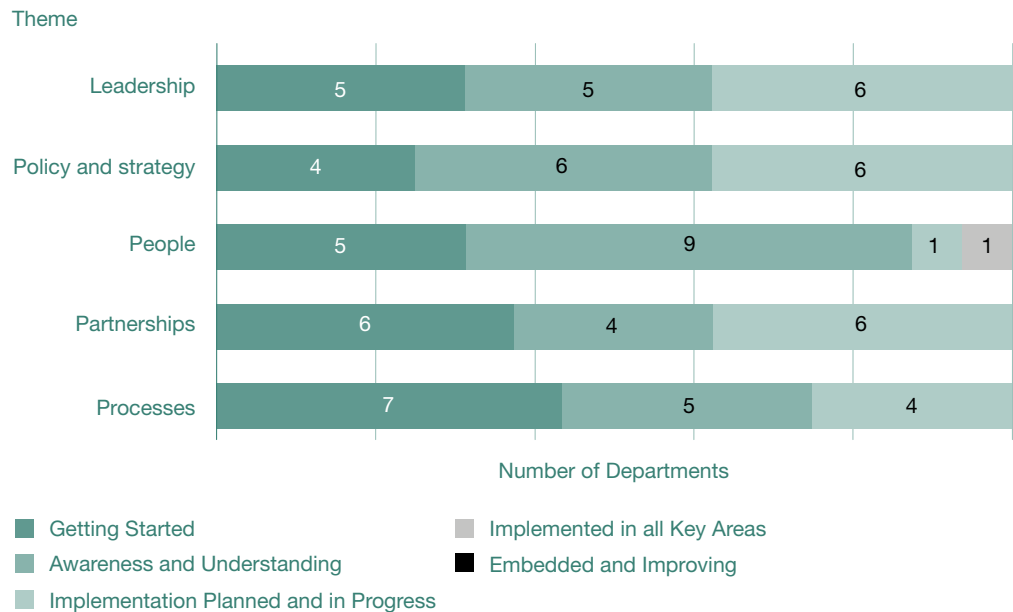
The acronyms used in this Figure to represent different Departments are set out at the beginning of Appendix 3.

4.6 Departments in the second and third categories have identified a wide range of different activity and risk assessment work underpinning their self-assessment scores. For example, DfT is keenly aware that transport networks may be vulnerable to future climate change, is chairing a cross-government project on ‘Adaptation and Infrastructure’ and is working to embed adaptation into its transport planning. DH in contrast has scored itself lower and states that it has yet to develop a strategic approach to adaptation. However, the Department considers that climate change could have significant implications for public health, has undertaken research to develop understanding of these implications, and has measures in place to respond to extreme events such as heat waves, which may become more frequent in future. Appendix 3 contains a summary of each individual Department’s self-assessment of the risks and their capacity to deal with them.

Trends across the five themes

4.7 Departments have scored themselves higher on ‘Leadership’ and ‘Policy and Strategy’ than ‘Processes’ and ‘People’ (**Figure 11**). This may be a recognition that leadership and direction must be tackled first, before changes to people’s skills and processes can be driven through an organisation.

Figure 11
Self-assessment across five themes



Source: National Audit Office survey of government Departments

Leadership

4.8 Establishing clear leadership on climate change risks should help a Department assess for itself its priorities and whether it is effectively identifying, assessing and managing risks to its objectives from future climate change.

4.9 Some Departments reported that they had established strategic leadership but for the majority, those in leadership positions are just starting to think about climate change risks or their strategic approach ('Getting Started' or building 'Awareness and Understanding') (see Figure 11). Even though some Departments such as Defra and CLG assessed their leadership on climate change risks as relatively strong, no Department could yet state that senior leaders were ensuring a consistent and thorough approach to managing climate change risks across the Department.

4.10 The Boards of the majority of Departments have not yet formally considered how to approach work on climate change risks and adaptation nor incorporated consideration of climate change risks in their formal risk management arrangements. This had not prevented these Departments from identifying some relevant risks or having undertaken relevant work. Those Boards that had considered how to approach work on climate change risks, and had arrangements for considering these risks at Board level, tended to be those that scored well across the self-assessment framework as a whole, including Defra, CLG and the Forestry Commission. CLG's Executive Board has established a clear structure to manage and report back on the Department's climate change mitigation and adaptation activities. A Climate Change and Sustainable Development Programme Board, chaired by a Director, reports to the Executive Board's Delivery Sub-Committee. The Executive Board was recently briefed on the UK Climate Projections 2009 and Departmental adaptation activities. The Forestry Commission has established a Climate Change Strategy Group, chaired by the Director General, to coordinate and lead the Commission's work on climate change adaptation. Some Departments considered some risks relating to the current climate at Board level, such as DH's consideration of responses to flooding, heat waves or potential disease outbreaks, which will increase resilience to future climate change as well.

4.11 Departments' responses showed growing awareness of the need to consider adaptation issues. Seven Departments reported that the most senior staff member with responsibility for adaptation sat on the Board, highlighting the potential for it to move up these Departments' agendas if needed.

Policy and strategy

4.12 Climate change risks can be relevant to specific policy areas within Departments and to operational teams such as estates and procurement. A strategic approach to assessing and managing climate change risks is important so that work across the Department can be coordinated and important decisions can be made in the context of climate change, progress can be monitored and it can be communicated to others.

4.13 The majority of Departments have accepted the need for a strategic approach to identifying and managing climate change risks, but some reported that they had developed, and were implementing, strategies to assess and manage climate change risks. The majority of Departments reported that they were either at the 'Awareness and Understanding' stage or 'Getting Started' in terms of developing policies and strategies for climate change risks (Figure 11). Many reported that developing a strategy was complicated by their uncertainty over the precise nature, timing and location of climate change impacts and the long timescales of climate change compared to short to medium term planning and policy horizons. Some also noted that financial and resource pressures could act as barriers to dealing with climate change risks.

4.14 Only two of the Departments that stated they were planning and implementing policies and strategies – Forestry Commission and MoD – had an overarching strategy for their Departments' work on climate change adaptation. Of the Departments at an earlier stage in thinking about strategic approaches to adaptation, DWP was notable for having a clear and agreed position on the next steps for the Department, having commissioned a scoping report to identify the potential risks from climate change to the Departments' objectives.

4.15 Even in the absence of overarching strategies, Departments have been developing their awareness of climate change risks to specific policy areas, and in some cases responses to those risks. Only MoJ has not identified any policy areas that need to assess and manage climate change risks, but has recognised these risks in relation to its estates.

4.16 The majority of Departments also identified operational teams that needed to assess and manage climate change risks, principally their Estates teams, but some also cited their Procurement teams. CLG, Defra, MoD and MoJ, have established specific estates requirements to address climate change risks, with MoJ, for example, concerned to ensure the resilience of its courts and prisons estates to a changing climate.

4.17 In June 2009, alongside its launch of the new UK Climate Projections 2009, the Government announced a new requirement that Departments produce high-level Adaptation Plans by spring 2010.

People

4.18 Departments need staff who understand climate change risks and have suitable skills and training to take forward their work on assessing and managing climate change risks. Requirements will vary from Department to Department and within Departments, depending on the significance of climate change risks to their business, the existing level of awareness of the issues and the current extent of work on adaptation.

4.19 Most Departments recognise that they need to address their staff capacity and resources to take forward adaptation work. The MoD in particular identified the need to increase capacity and skills in connection with addressing impacts on infrastructure and incorporating adaptation issues into major contracts. Departments have started to think about their staff requirements and their training and skills needs and have started to put staff in place to work on adaptation. However, most have not yet implemented training programmes for staff on climate change risks, nor do they have substantial guidance in place, meaning that understanding of climate change risks is likely to be patchy.

4.20 Most, but not all Departments highlighted some form of coordination on climate change risks within their Department, aiming to help staff make better progress on identifying and managing climate change risks. Defra, with its leading role for the ACC Programme, has scored itself significantly ahead of all other Departments and highlighted its adaptation network, facilitating knowledge sharing on climate change risks across the Department. CLG and DfT were also making good use of internal teams, steering groups or networks for adaptation, while others highlighted that existing climate change mitigation or sustainable development structures could, or indeed already had been, extended to include adaptation.

4.21 Many Departments expect to need to train their staff on the new UK Climate Projections 2009. The Forestry Commission is planning to roll out a training package on climate change for all public facing staff in 2009-2010, which will include coverage of the Projections. On a smaller scale, a number of Departments are planning to hold briefings or seminars on the Projections or include adaptation in more general courses on climate change or sustainable development.

4.22 Giving staff specific objectives on climate change adaptation is another indication of commitment to taking forward, and monitoring, work on adaptation and about half of Departments stated that some staff had adaptation built into their objectives in some way.

Partnerships

4.23 Climate change risks are likely to have impacts across different sectors and require national, regional and local engagement, with responses specific to local situations. So partnership working will be key to effective adaptation.

4.24 Departments are clearly aware of the importance of working in partnership, and some were able to identify ways in which they were working with key partners on climate change risks. Departments identified more than 20 agencies and other bodies which they sponsor, or work closely with, that share responsibilities for assessing and managing climate change risks. Bodies identified ranged from regulators and inspectors (e.g. Ofgem, Ofcom, Postwatch, Office of Rail Regulation, Audit Commission), Executive Agencies (e.g. Environment Agency, Natural England, Highways Agency, Infrastructure Planning Commission, Homes and Communities Agency, UK Border Agency),

Government Offices, Regional Development Agencies, other Departments and local authorities. A few Departments reported specific mechanisms for working with, and monitoring, their sponsored bodies on adaptation either through involvement in steering groups, allocating funding for adaptation, commenting on strategies or joint projects.

4.25 Some Departments reported that they are beginning to discuss specific contractual arrangements with their procurement partners regarding climate change risks. In particular, MoD and DWP have discussed adaptation with their Estates providers and MoD intends to include adaptation as a key part of specifications and management of its next generation of Estates contracts. The ACC Programme team and OGC will be developing guidance to incorporate climate change adaptation into public procurement decisions which will be relevant for government Departments and may help procurement teams incorporate climate change risks into contractual arrangements where appropriate.

Processes

4.26 To embed a systematic approach to addressing climate change risks, Departments need their systems and processes for policy making and impact assessment, programme management, budgeting and for their operations including estates and procurement, to identify relevant risks and to provide tools for incorporating consideration and management of those risks.

4.27 Most Departments scored themselves at the 'Getting Started' stage for Processes, and although they may be identifying areas where processes need to incorporate climate change risks, have not yet made substantial changes. This is one of the thematic areas where least progress has been made, which may be expected as changes to processes would tend to follow on from leadership and establishing strategies. Some Departments have, however, made changes to specific processes that relate to particular aspects of their remit. For example, the Cabinet Office has built climate and weather related risks into the processes for considering short term risks to critical national infrastructure and national security strategy. Ten Departments reported they had included consideration of climate change risks using existing processes in their appraisals of key policies and the associated impact assessments.

4.28 Some Departments highlighted that they were waiting for further guidance planned from Defra – in the form of UK Climate Projections 2009 and amendments to government guidance on policy appraisal (supplementary guidance to the HM Treasury Green Book, discussed in Paragraph 2.23 – 2.25) before developing guidance for policy staff on how to assess and manage climate change risks. These were launched in June 2009 so Departments can assess how they might change their own processes accordingly.

Appendix One

Methodology

1 The methodology for this briefing was designed to provide the EAC with an overview of domestic climate change adaptation policy in England, including the implications of the Climate Change Act 2008, the cross-government Adapting to Climate Change Programme and the current capacity across government Departments to adapt to climate change.

Survey of Departments

2 We surveyed each Department represented on the cross-government Adapting to Climate Change Programme to gather information on each Department's:

- key risks to objectives from future climate change, and any policy responses to date;
- assessment of the significance of these 'climate change risks';
- views on barriers and particular challenges for adaptation; and
- score against the self-assessment framework to indicate capacity to assess and manage climate change risks.

The self-assessment framework used, and the methodology behind its development, is set out in Appendix 2.

3 We used this information to present an overview of Departments' current assessment of the risks from future climate change impacts, and key policy responses to date. We also analysed the information across Departments to present an overview of their current capacity to assess and manage climate change risks. We produced a summary for each Department on key risks to their objectives from future climate change impacts and the results of their self-assessment. We also clarified information from our departmental survey with the individual Departments by phone where necessary, but did not validate the information Departments' provided, or the self-assessment scores awarded.

Review of policy literature

4 We reviewed a variety of literature including departmental reports and consultation documents, publications from the UK Climate Impacts Programme and other key stakeholders. Our literature review provided background to current scientific evidence on future climate change and potential consequences, recommended approaches to domestic climate change adaptation, and government policy. Our aim was to gain an overview of the domestic climate change adaptation policy landscape, rather than an analysis of the detailed impacts and policy responses in any one area such as flooding or coastal erosion.

Interviews with the ACC Programme

5 We conducted semi-structured interviews with a number of policy officials in the Adapting to Climate Change team in the Department for Environment, Food and Rural Affairs. The interviews enabled us to gather further information on the work of the cross-government Adapting to Climate Change Programme, including its overall aim, priorities and views on its key challenges.

Stakeholder views

6 During the scoping and fieldwork stages of this review, we consulted stakeholders from:

- UK Climate Impacts Programme.
- Environment Agency.
- Greater London Authority.
- Royal Commission on Environmental Pollution.

Appendix Two

NAO self-assessment framework for assessing and managing climate change risks

1 We asked Departments to complete a self-assessment of their capacity to assess and manage climate change risks. We developed the NAO self-assessment framework following a review of literature and guidance for organisations on how to adapt to climate change. We developed our framework around five themes for effective management of climate change risks – Leadership, Policy and Strategy, People, Partnerships and Processes, using the HM Treasury Risk Management Assessment Framework (HM Treasury Framework)³⁶ as a starting point. We adapted the HM Treasury Framework to specifically reflect effective management of risks from climate change impacts.

2 Departments were asked to score themselves against five levels of progress for each of the five themes. The overall question for each theme, and the self-assessment grid Departments were asked to score themselves against, is set out below. Departments were also given examples of what each level might mean in practice to aid their self-assessment.

3 The information presented in this briefing reflects Departments' own independent self-assessments of their progress in assessing and managing climate change risks, and has not been subject to independent validation by the NAO or through peer comparison by Departments. The self-assessment focuses on the capability and processes required to assess and manage climate change risks, and did not seek to evaluate the adequacy of individual Departments' policy responses to risks, nor make judgements about the appropriate level of progress for each Department depending on their remit and the risks faced. Departments' self-assessments may not be fully consistent if they have reached different interpretations of the meaning of the NAO self-assessment framework.

³⁶ HM Treasury (2004) *Risk Management Assessment Framework – a tool for Departments*.

Leadership

Overall question: To what extent do senior management support and promote management of climate change risks in your Department?

Getting Started	Awareness & Understanding	Implementation Planned and in Progress	Implemented in all Key Areas	Embedded and Improving
An appropriately senior level of management is starting to think about the risks future climate change impacts may pose to achieving Departmental objectives.	An appropriately senior level of management is aware of the need to assess and manage climate change risks to Departmental objectives and has made resources available to do this.	An appropriately senior level of management is taking the lead so that strategic approaches for addressing climate change risks are being implemented.	An appropriately senior level of management is ensuring that climate change risk management is being applied consistently and thoroughly across the Department.	An appropriately senior level of management is driving further integration of effective climate change risk management across the Department at all levels, and is reviewing the effectiveness and efficiency of current arrangements.

Policy and Strategy

Overall question: How clear and developed is your Department's strategy for assessing and managing climate change risks?

Getting Started	Awareness & Understanding	Implementation Planned and in Progress	Implemented in all Key Areas	Embedded and Improving
The Department is thinking about what policies and strategies might be needed to assess and manage climate change risks.	The Department has accepted the need for a strategy and related policies to assess and manage climate change risks. Work may have been started to develop a strategic approach to assessing climate change risks across Departmental objectives.	The Department has developed a strategy to assess and manage climate change risks. The strategy has been communicated to key staff and is being implemented in priority areas. Action plans are being developed to respond to priority risks where necessary.	The Department's strategy for assessing and managing climate change risks is effectively communicated, implemented and monitored across the Department. Action plans to respond to priority risks are being embedded into normal business planning.	Effective assessment and management of climate change risk is an inherent feature of Department policies and processes and is being integrated with normal risk management. The Department is reviewing its climate change risk management strategies and updating where necessary.

People

Overall question: To what extent are people in your Department equipped and supported to manage climate change risks?

Getting Started	Awareness & Understanding	Implementation Planned and in Progress	Implemented in all Key Areas	Embedded and Improving
The Department is scoping who might need to assess and manage climate change risks. It is also putting in place the personnel requirements needed to take forward initial work on climate change adaptation.	Key people are aware of the need to assess and manage climate change risks, and are involved in developing the Department's strategy. They understand basic climate change risk management and adaptation concepts.	There is suitable guidance for staff available to implement strategies for assessing and managing climate change risks. A training programme is being implemented.	There is a network of key people across the Department, with the skills to assess and manage climate change risks. The Department is making progress in promoting a culture of climate change risk management.	All relevant staff have the skills and knowledge to manage climate change risks effectively. People are generally empowered to be innovative in managing climate change risks. There are opportunities to enhance their climate change risk management skills.

Partnerships

Overall question: How developed and effective are arrangements for managing climate change risks with your Department's partners?

By partners, we mean other organisations which significantly influence or manage the delivery of the Department's objectives such as sponsored bodies, contractual partners for PFI, suppliers, local and regional government or other Departments.

Getting Started	Awareness & Understanding	Implementation Planned and in Progress	Implemented in all Key Areas	Embedded and Improving
The Department is starting to identify the different partners, and types of partnership arrangements, that will need to play a significant part in assessing and managing climate change risks.	The Department has identified the key partners and types of partnership arrangements that will need to include arrangements for climate change risks. The Department is aware of the need to agree approaches to assessing and managing climate change risks with these partners.	The Department is developing and agreeing approaches for assessing and managing climate change risks with its partners.	Climate change risks are being managed consistently in partnership arrangements in key areas and across organisational boundaries.	The Department has established sound climate change risk management arrangements with its partners. The Department is monitoring the effectiveness of these risk management arrangements and is identifying areas for improvement.

Processes

Overall question: To what extent do your Department's processes incorporate effective management of climate change risks? We are referring widely to the processes in place throughout the Department, including those for policy making and impact assessment, programme management, operations including estates and procurement, and service delivery.

Getting Started	Awareness & Understanding	Implementation Planned and in Progress	Implemented in all Key Areas	Embedded and Improving
The Department has started to identify which parts of its business need to incorporate procedures for assessing and managing climate change risks into their processes. It is also identifying the extent to which climate change risks have already been considered on an ad-hoc basis.	The Department has identified the parts of its business which need to incorporate procedures for assessing and managing climate change risks. Some standalone procedures to assess climate change risks are being developed. The Department is identifying existing sources of tools and best practice.	Recommended procedures for assessing and managing climate change risks are being developed for all key processes in key areas. Appropriate professional advice and tools are being adapted to Departmental needs.	Recommended procedures for climate change risk management are implemented in all key areas and embedded into key processes. Appropriate guidance and tools are available.	Climate change risk management is an integral part of the Department's core processes (policy, planning, delivery etc.) and integrated with normal risk management. Data are collected to monitor and improve climate change risk management performance.

Appendix Three

Departments' assessments of climate change risks

1 This Appendix contains a summary for each Department represented on the Programme Board of the cross-government Adapting to Climate Change Programme of their views of the key risks to their objectives from future climate change impacts and any policy responses they have in hand; and their self-assessment of their capacity against the NAO's framework for managing climate change risks. We clarified information provided by individual Departments where necessary. We have not validated the information provided, nor the self-assessment scores awarded. These summaries should therefore be interpreted as summaries of Departments' views and self-assessments, as at the time of our survey in April 2009.

2 The summaries are in alphabetical order:

● Cabinet Office (CO)	52
● Department for Business, Enterprise and Regulatory Reform (BERR)	54
● Department for Children, Schools and Families (DCSF)	56
● Department for Communities and Local Government (CLG)	58
● Department for Culture, Media and Sport (DCMS)	62
● Department for Environment, Food and Rural Affairs (Defra)	65
● Department for Innovation, Universities and Skills (DIUS)	70
● Department for Transport (DfT)	72
● Department for Work and Pensions (DWP)	76
● Department of Energy and Climate Change (DECC)	78
● Department of Health (DH)	81
● Forestry Commission (FC)	84
● Her Majesty's Treasury (HMT)	87
● Home Office (HO)	90
● Ministry of Defence (MoD)	92
● Ministry of Justice (MoJ)	95

3 BERR and DIUS are being treated as separate Departments for the purposes of this briefing, although both are now part of the newly formed Department for Business, Innovation and Skills (BIS).

Cabinet Office

1 The Cabinet Office has the overarching purpose of ‘making government work better’ and has identified that two of its strategic objectives could be significantly affected by climate change:

- Build an effective UK intelligence community in support of UK national interests; and the capabilities to deal with disruptive challenges to the UK.
- Improve outcomes for the most excluded people in society, and enable a thriving third sector.

Key risks to departmental objectives from future climate change

2 The Cabinet Office is charged with building capabilities to deal with disruptive challenges to the UK, and the profile of many of these challenges may be influenced significantly by climate change. Climate change has been identified as a priority area within the National Security Strategy. The risks associated with climate change, however, are just part of a much wider portfolio of risks that are also influenced by economic, political and demographic factors.

3 In the short term, climate and extreme weather-related risks are included in the Cabinet Office’s national risk assessment process and latest National Risk Register, which forms the basis for decisions on contingency and emergency planning.

4 The risks associated with climate change might have a disproportionate effect on the most excluded people in society, as well as the third sector, but this may not be the most significant challenge in these areas over the coming years. The economic climate is likely to have a much more significant impact than climate change in the short to medium term.

5 To summarise, the Cabinet Office has identified potential risks to a limited number of its objectives, but in a systematic way. It is taking account of these risks in devising strategies relating to National Security and resilience. The key risks that it has identified are set out below.

Risk	Response to risk
Climate change will be a wide-ranging driver of global insecurity.	National Security Strategy
Rising sea and river levels and other impacts of climate change will increase the incidence and severity of civil emergencies.	National Security Strategy (and the work of the Adapting to Climate Change Programme and government Departments to increase resilience).

Self-assessment against climate change risk assessment framework

The Cabinet Office's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of the Cabinet Office's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership		✓			
Policy & Strategy		✓			
People		✓			
Partnerships		✓			
Processes			✓		

Leadership

A Cabinet Office Board member has specific responsibility for adaptation. The Board has not yet considered how the Cabinet Office should lead and manage its work on domestic climate change adaptation. But the Cabinet Office is currently working on incorporating climate change risks into its strategy, and is also in the process of reviewing, revising and updating its business continuity arrangements.

Policy and Strategy

The Cabinet Office has a strategy that recognises climate change as a key driver of national security, has related policies to assess and manage climate change risk, and is contributing to a clear and agreed government-wide plan for taking this work forward. The National Risk Assessment considers a number of risks when deciding on priorities. Risks that are likely to be affected by climate change through, for example, increased severity or frequency, are considered among these.

People

The Cabinet Office considers that key people are aware of the need to assess and manage climate change risks and are involved in developing

strategy. Those taking forward work on adaptation have been identified. The Cabinet Office has identified sources for information on climate change to inform its strategic policy making. It has not identified training needs for key staff on adaptation and managing climate change risks.

Partnerships

As part of work on protecting Critical National Infrastructure from natural hazards, in its contribution to cross-departmental work on adaptation, and in its work on the National Security Strategy, the Cabinet Office has identified the need to work with others to identify and manage cross-sectoral climate change risks.

Processes

The National Risk Assessment and National Security Strategy processes include climate change considerations. In connection with its work on protecting Critical National Infrastructure from natural hazards the Cabinet Office has examined its processes for planning new infrastructure, to identify where climate change risks need to be taken into account. It has also agreed a National Risk Assessment methodology to provide guidance to help staff assess and manage climate change risks.

Department for Business, Enterprise and Regulatory Reform (now part of the Department for Business, Innovation and Skills)

1 The Department for Business, Enterprise and Regulatory Reform (BERR) has identified three of its objectives that could be significantly affected by climate change:

- Promoting the creation and growth of business and a strong enterprise economy across all regions.
- Ensuring that Government acts as an effective and intelligent shareholder, and provides a source of excellent corporate finance expertise.
- Providing the professional support, capability and infrastructure to enable its objectives and programmes to be successfully delivered.

Key risks to departmental objectives from future climate change

2 BERR has started to identify potential risks, but as an initial exercise for a limited number of its objectives. It is not yet in a position to assess the extent of climate change risk impacts across all objectives.

3 Although BERR has not carried out a comparison of climate change risks with the other risks that it has to manage, it does have a strategic risk register in respect of its own operations. The key adaptation risks identified, and the Department’s responses, are set out in the table below.

Risk	Response to risk
<p>There could be negative effects on business performance caused by extreme weather events. Businesses may not account for climate change risk in their business plans and, aside from issues around business continuity, their ability to develop new products, processes and technologies may be hindered.</p>	<p>In terms of flooding, BERR has a Headquarters Flood Plan in place. As lead Department for the telecommunications industry, activity is focused on Sir Michael Pitt’s Review into the 2007 floods and the Department is working with industry to highlight the recommendations which will impact upon them. The Natural Hazards Team established within the Cabinet Office Civil Contingencies Secretariat in May 2009 will be coordinating efforts to identify and counter the risks to national infrastructure from natural hazards. BERR will be working with this team and telecommunications companies to consider how to address the Pitt Review’s recommendations.</p>
<p>Climate change adaptation risks may not be taken account of within Government-owned businesses through the Shareholder Executive.</p>	<p>No substantive action has yet been taken by the Shareholder Executive in terms of those government-owned businesses for which they have responsibility (such as Royal Mail), but the issue is being raised at Director level with a view to perhaps reflecting a climate change objective in performance targets.</p>
<p>Severe changes in weather patterns may adversely affect the smooth running of the Department and delivery of its service to business (for example, security of energy supply and internal infrastructure).</p>	<p>A Headquarters Business Continuity Plan is in place.</p>

Self-assessment against climate change risk assessment framework

BERR's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of BERR's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership	✓				
Policy & Strategy	✓				
People	✓				
Partnerships	✓				
Processes	✓				

Leadership

Senior management is just beginning to think about adapting to the risks of climate change. The focus so far has been on embedding Sustainable Development within the business planning process and internal operations. Sustainable Development has been discussed at Board level where a decision to appoint a series of Sustainable Development Champions within BERR, including at Board level, was endorsed.

Policy and Strategy

While there is no plan dedicated to climate change adaptation risks at present, BERR is considering how to incorporate this into its future Greenhouse Gas Reduction Plan. Adaptation is also a feature of BERR's Sustainable Construction Strategy. There are six specific targets or deliverables contained in it, of which one relates to adaptation, and all of which are being measured by Defra and CLG (where appropriate).

People

The Sustainable Development team within the Low Carbon Business Opportunities Unit has recently been appointed the lead in taking forward

domestic climate change adaptation. Its role is largely to coordinate and manage stakeholders, and not necessarily to set milestones or objectives for others' business plans.

Partnerships

BERR is in an early stage of working with partners to develop effective arrangements in assessing and managing climate change risks. It needs to overcome the complexities of working with all Regional Development Agencies, perhaps by working through one designated Agency. BERR plans to raise the issue with its regulators at Director level, with a view to perhaps reflecting a climate change objective in performance targets.

Processes

BERR's internal guidance for considering key policy and impact assessments refers to current Government guidelines on Impact Assessments and does not explicitly consider future climate change risks. BERR contributed to the development, led by Defra, of additional supplementary guidance for the HM Treasury Green Book, encouraging government Departments to address adaptation issues in their appraisal of policy and investment decisions.

Department for Children, Schools and Families

1 The Department for Children, Schools and Families (DCSF) has identified two strategic objectives that could be significantly affected by climate change:

- secure the wellbeing and health of children and young people, and safeguard the young and vulnerable.
- achieve world class standards in education.

Key risks to departmental objectives from future climate change

2 To provide an early focus, DCSF has identified potential risks to a limited number of objectives. Its major challenge is to ensure that the buildings in which children learn, or are cared for, are comfortable in a changed climate. Building simulations which might demonstrate how to achieve this are under development. CLG leads the government on the issues of building regulations and planning guidance.

Risk

Climate change may damage the health of children and young people.

Existing schools and children's settings may become overheated.

The design of new and refurbished schools and children's settings (e.g. children's centres) may not allow resilience to overheating.

There may be more incidence of flooding in existing schools and children's settings.

Designs for new and refurbished schools and children's settings may not allow resilience to flooding.

Rising temperatures might require changes in the school calendar, and in exam dates.

Response to risk

There is a joint DCSF and Department of Health group dealing with children's health issues. The Health Protection Agency and DCSF's Design Team are liaising on design and premises issues.

Guidance on managing risks, and designing settings to prevent them, has been issued jointly by DCSF and the Health Protection Agency.

DCSF is working with Defra, CLG and Third Sector organisations such as the Chartered Institute of Building Services Engineers and the University of Exeter's Centre for Energy and the Environment, with funding from the Defra Climate Change Adaptation Strategic Evidence Fund to support new research, guidance and demonstration of architectural interventions to ameliorate summertime overheating in schools.

Local Authorities are in the lead. Some action has been taken, especially in areas that have recently experienced flood damage, for example, Hull.

Defra, CLG and Third Sector organisations are in the lead – for example, the Construction Industry Research and Information Association (CIRIA) has published guidance on sustainable water management for schools. The Environment Agency requires drainage strategies for new schools.

No specific response, although the Department believes that changes could be made without affecting educational outcomes.

Self-assessment against climate change risk assessment framework

DCSF's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DCSF's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy		✓			
People		✓			
Partnerships		✓			
Processes		✓			

Leadership

DCSF does not have a separate lead for climate change adaptation. Leadership roles are assigned to those responsible for specific areas of the business. For issues around adaptation of school buildings, the Director responsible for school capital spend will be the lead. Responsibility for considering changes to school term times lies with the Pupil Wellbeing, Health and Safety Unit, while for changes to exam times it lies with the Exams Delivery Unit. The Sustainable Development Unit in the Department coordinates delivery of Sustainable Development Action Plan commitments, and work on adaptation is covered within associated delivery plans.

Policy and Strategy

DCSF does not currently have a clear and agreed plan for assessing and managing climate change risks, but it has identified a key area that could suffer impact: school buildings and other buildings for children and young people.

People

Adaptation is now considered a major current issue. There was a recent presentation to the DCSF Board by the Defra Climate Projections 2009 team. Staff responsibilities are connected to the Sustainable Development Delivery Plan. In terms of training, DCSF has previously responded positively to offers of briefing when UK Climate Projections are published.

Partnerships

DCSF's key partner is Partnerships for Schools, an NDPB set up to deliver the Building Schools for the Future (BSF) programme. Partnerships for Schools works closely with the DCSF's policy unit to ensure that any actionable developments relating to climate change are amalgamated into the BSF programme. From 1 October 2009, Partnerships for Schools will be responsible for the management and delivery of all government school building and refurbishment programmes. DCSF will continue to work with Partnerships for Schools to ensure that climate change issues are fed through to all these programmes.

Processes

A new website on Making Policy includes detailed information on how to assess the impact of climate change.

Department for Communities and Local Government

1 The Department for Communities and Local Government (CLG) identified that all of its six strategic objectives could be significantly affected by climate change:

- Provide support for local government that empowers individuals and communities and delivers high quality services efficiently.
- Improve the supply, environmental performance and quality of housing that is more responsive to the needs of individuals, communities and the economy.
- Build prosperous communities by improving the economic performance of cities, sub-regions and local areas, promoting regeneration and tackling deprivation.
- Develop communities that are cohesive, active and resilient to extremism.
- Provide a more efficient, effective and transparent planning system that supports and facilitates sustainable development, including the Government's objectives in relation to housing growth, infrastructure delivery, economic development and climate change.
- Ensure safer communities by providing the framework for the Fire and Rescue Service and other agencies to prevent and respond to emergencies.

Key risks to departmental objectives from future climate change

2 CLG has identified the potential risks from climate change to a limited number of its objectives in a systematic way, and across all of its objectives as an initial exercise. Although climate change risks are more likely to impact on the delivery of CLG's objectives over the medium to long term, the Department takes account of climate change risks when making shorter term policy decisions (such as the development of new planning policies) to minimise any longer term impacts.

3 An example would be flooding and the planning system, where the focus on river and sea flooding needs to be developed to address surface water flooding. This is being done with Defra and the Environment Agency, for example, through the draft Floods and Water Bill.

Risk	Response to risk
<p>Probable faster rates of coastal erosion and sea-level rises may lead to increased and new risks of coastal changes and flood risks within the lifetime of existing communities and new developments.</p>	<p>Relevant planning policies and guidance, such as the supplement to Planning Policy Statement 1 (PPS 1), PPS 25: Development and Flooding, and the emerging PPS on coastal change.</p>
<p>Increased volumes and intensity of rainfall may increase river and surface water flood risks.</p>	<p>Periodic reviews of the Building Regulations and the Code for Sustainable Homes.</p> <p>Publication of PPS 25: Development and Flooding, in December 2006. Good practice guidance published in June 2008.</p>
<p>Changes in weather and rainfall patterns, alongside growing demand pressures from new developments and population growth, may increase risks to water supply and extend water stress, adding to water use pressures particularly in already water stressed areas.</p>	<p>CLG is working with Defra and the Environment Agency on action to follow up the Pitt Review and new responsibilities for local authorities.</p> <p>Periodic reviews of the Building Regulations and the Code for Sustainable Homes.</p>
<p>Higher summer temperatures may damage the health and welfare of occupants in buildings with higher levels of insulation.</p>	<p>CLG has laid regulations that will introduce, on 1 October 2009, for the first time, water efficiency standards for all new homes into the Building Regulations and is working to raise standards further through the use of the Code for Sustainable Homes for public funded housing – and where appropriate under local planning policies. The Department is also liaising with Defra where appropriate on wider policies to manage water demand.</p>
<p>More frequent extreme weather events may mean that the emergency services are not adequately prepared to respond to the frequency and scale of increased demand for their services.</p>	<p>Although high levels of insulation do not necessarily automatically lead to this problem, CLG has already made it a requirement in Building Regulations to consider heat gains as well as heat losses in domestic buildings. The latest climate projections will also be considered as part of the planned review of Building Regulations.</p>
<p>Climate impacts increase pressures on local services and local funding streams.</p>	<p>Combating this risk is being built into the emergency services' processes, while awaiting the next set of UK Climate Projections.</p> <p>Fire and rescue services can identify risks such as those from climate change impacts as part of their 'Integrated Risk Management' processes, and provide equipment, personnel and training as appropriate.</p> <p>High volume pumping units funded by CLG through the Government's New Dimension programme are now available across the country to respond to major flooding incidents.</p>
<p>Climate impacts increase pressures on local services and local funding streams.</p>	<p>Local authorities would normally be expected to address climate change impacts from general funding streams. Where specific new measures are required by Government, new burdens procedures would apply, and if necessary extra funding would be made available.</p>

Self-assessment against climate change risk assessment framework

CLG’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of CLG’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy			✓		
People		✓			
Partnerships			✓		
Processes			✓		

Leadership

The most senior individual with responsibility for climate change adaptation is the Director General of Housing and Planning, who sits on CLG’s Board. Although the Department does not regularly consider climate change risks at the Board level, the Board has considered how the Department should lead and manage its work on climate change adaptation. Decisions taken so far include the establishment of a Climate Change and Sustainable Development (CCSD) Programme Board to manage adaptation and mitigation activities. The Director General chairs a group of CLG directors and others from DECC, Defra, the Sustainable Development Commission and the Environment Agency, which considers strategic climate change issues for the Department. The CLG Board has been briefed on the 2009 UK Climate Projections.

Policy and Strategy

CLG has identified the following policy areas where climate change risks in particular need to be assessed and managed: planning for new development in relation to flooding and coastal erosion; standards for new buildings; retrofit of existing buildings; fire and resilience; and regeneration. The CCSD programme reports on actions, issues and risks, with appropriate programme documentation being developed. Priorities for CLG’s operations include the requirement for all new buildings on CLG’s estate to fully consider climate change adaptation and resilience, and consideration of future flood risks and rainwater harvesting when selecting properties or specifying new projects.

People

CLG's work on climate change overall is coordinated by a programme management team, located in the Climate Change and Sustainable Development Division. A separate team within the Division is responsible for coordinating activities on climate change adaptation. One of the Division's responsibilities is to put in place and manage an effective programme management system so that senior management has assurance that the Department is able to deliver its carbon budget, climate change and sustainable development policy commitments. Staff have received training on past climate change projections, and CLG has organised a briefing session on the 2009 UK Climate Projections.

Partnerships

Planning policies cut across many sectors and, as the Department responsible for the planning system, CLG works with partners in other sectors in developing planning policies to address climate change risks. Key CLG partners include the Homes and Communities Agency, whose first corporate plan needs to take proper account of climate change issues, the Audit Commission on the Comprehensive Area Assessment process, the Infrastructure Planning Commission, and Defra and the Environment Agency on water, flooding and coastal erosion risks.

Processes

CLG has included climate change risks in key policy appraisals and impact assessments. New policy proposals such as planning policy statements need to produce an Impact Assessment which should consider the environmental impacts – and by association how to respond to the impacts of climate change. Issues relating to climate change have been considered as part of recent work on Building Regulations, for instance around conservation of fuel and power, and around water efficiency. The latest Climate Projections will also be considered as part of the ongoing programme of review of Building Regulations to ensure these remain robust and buildings sustainable.

Department for Culture, Media and Sport

1 The Department for Culture, Media and Sport (DCMS) has identified three strategic objectives that could be significantly affected by climate change:

- Supporting talent and excellence in culture, media and sport.
- Realising the economic benefits of the Department's sectors.
- Delivering a successful and inspirational Olympic and Paralympic Games in 2012 that provide for a sustainable legacy and get more children and young people taking part in high quality physical education and sport.

Key risks to departmental objectives from future climate change

2 DCMS is not yet in a position to make a full assessment of the risks that climate change will pose to its objectives. It is commissioning research that will set out the risks to all its sectors. In the main, the Department shares risk through the bodies it sponsors. It has identified two key adaptation risks, as set out in the table below.

Risk

Meeting the demands of the changing climate may reduce the opportunities to encourage excellence in culture, media and sport by requiring funding to be diverted into adapting infrastructure to cope with new demands. For example, coastal erosion and extreme weather events (flooding and drought) will have a potential effect on tourism, as well as heritage assets, museum, gallery and library collections, sports facilities and the built environment.

2012 Olympic Games staging, and especially legacy, may be negatively affected if planning and implementation does not take climate change impacts into consideration sufficiently.

Response to risk

DCMS has commissioned research which will set out the risks to all sectors. Its response is predominately indirect, sharing the risk through the bodies which it sponsors. The Department has been working with Defra to contribute to policy development on coastal erosion and flooding.

DCMS drives the London 2012 sustainability agenda as coordinator and secretariat of the Cross-2012 Programme Sustainability Group, which reports to the Olympic Board on achievements and challenges, including those concerning climate change.

Self-assessment against climate change risk assessment framework

DCMS's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DCMS's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership		✓			
Policy & Strategy		✓			
People		✓			
Partnerships			✓		
Processes	✓				

Leadership

DCMS's Chief Analyst, who is on the Departmental Board, is the most senior official with specific responsibility for adaptation. The Board will consider how DCMS should lead and manage its work on domestic climate change adaptation, including examination of risks and opportunities indicated by the research results, in September 2009.

Policy and Strategy

DCMS is committed to continuing certification to the international environmental standard ISO14001, which covers all its operational aspects. This standard is reflected in Sustainable Operations on the Government Estate (SOGE) targets for reducing carbon and other greenhouse gases. The Department is also implementing a sustainable procurement action plan and is encouraging its agencies and NDPBs to put similar initiatives in place. The Department's Sustainable Development Action Plan, published in August 2008, supports a coordinated approach between all these initiatives, covering the period 2008-2011. The document also illustrates the ways in which

the Department encourages its sectors and those who take part in related activities to do so with regard to sustainability.

People

DCMS is currently reassessing priorities and staff resources in relation to sustainable development and climate change. DCMS's London 2012 sustainability team is not responsible for identifying or directly managing climate change risks, but is responsible for ensuring that risk is managed by the relevant London 2012 delivery agencies.

Partnerships

The Government Olympic Executive for the 2012 London Olympic and Paralympic Games is working in partnership with the London Organising Committee and the Olympic Delivery Authority, and has a sustainability plan in place (published in November 2007, with an update in December 2008) encouraging sustainable development and adaptation to climate change. DCMS provides leadership and supports the independent endeavours of all these bodies.

Processes

DCMS has no current plans for new infrastructure, but has a cross-cutting role promoting better public building and the use of public space, with its Secretary of State holding the role of cross-government Design Champion. DCMS sponsors the Commission for Architecture and the Built Environment (CABE), which promotes high standards in architecture and the design and maintenance of the built environment. CABE has launched an online resource for local government leaders to help mitigate and adapt to climate change.³⁷ Focusing on the town and city scale, the site provides expert advice and best practice on energy, waste, water, transport, green infrastructure, public space, and leadership. DCMS also sponsors English Heritage, the Government's statutory advisers on the historic environment. As part of English Heritage's response to the issue, it has developed 'Climate Change And Your Home', an interactive web portal designed specifically to help those who own or manage traditionally constructed houses understand more about the potential impacts of climate change and ways to save energy.

³⁷ <http://www.sustainablecities.org.uk>

Department for Environment, Food and Rural Affairs

1 The Department for Environment, Food and Rural Affairs (Defra) leads on the cross-government Public Service Agreement to secure a healthy natural environment for everyone's well being, health and prosperity, now and in the future. Defra believes the strategic objectives that could be significantly affected by climate change are:

- A healthy, resilient, productive and diverse natural environment.
- An economy and a society that are resilient to environmental risk.
- Championing sustainable development.
- A thriving farming and food sector with an improving net environmental impact.
- A sustainable, secure and healthy food supply.
- Socially and economically sustainable rural communities.

2 Defra also coordinates the cross-Whitehall Adapting to Climate Change programme, leading projects that will help all Departments adapt to climate change, including, for example, the launch of the UK Climate Projections 2009, the National Climate Change Risk Assessment and Economic Analysis, and a project on adaptation and infrastructure. This work is covered in Part 2 of this briefing.

Key risks to departmental objectives from future climate change

3 Defra has started to identify potential risks to its objectives from the impacts of climate change. It has identified potential risks to a limited number of objectives in a systematic way, and across all objectives as an initial exercise. It believes that climate change risks are potentially significant across all objectives, and in the medium to long term are among the most significant risks to achieving its objectives.

4 Key outcomes – for example, on flooding, plant disease and exotic animal disease – are very sensitive to climate related change, and many of Defra's policy areas are about dealing with environmental risk. Climate change can cause the basic risk profiles to change, and so is a significant consideration in this area of work.

5 Key risks to Defra's objectives from the impacts of climate change, and a summary of responses, are set out in the table overleaf:

Risk	Response to risk
<p>The changing climate may cause variations in the habitat space available for wildlife, which could have negative impacts on biodiversity and essential ecosystems, for both the terrestrial and marine environments. The potential impacts of temperature changes and ocean acidification in the marine environment are poorly understood, but could be major.</p>	<p>Defra has published the England Biodiversity Strategy Climate Change Adaptation Principles – Conserving biodiversity in a changing climate. The Marine and Coastal Access Bill is designed to include flexibility for adaptation needed due to climate change.</p> <p>Research activities include: modelling changes to 32 species under various climate scenarios; exploring how land use in the UK could change over the next 50 years; an initiative to produce the world’s first National Ecosystems Assessment that will provide the evidence foundation of the ecosystems approach to policy that Defra is leading across Whitehall; the Marine Climate Change Impacts Partnership; and a five-year research programme on ocean acidification, costing £10 million.</p>
<p>Faster rates of coastal erosion, and continuing sea-level rise and tidal surge could have negative impacts on coastal communities and habitats.</p>	<p>The Government is developing an adaptation toolkit to assist communities in adapting to change where constructing defences is not the most appropriate means of managing flood and coastal erosion risk. Up to £28 million of Defra’s Comprehensive Spending Review settlement for 2008-2011 has been made available to support the adaptation toolkit.</p>
<p>Changing weather patterns, particularly increased intense precipitation at particular times, could cause more frequent and more serious flooding, with significant impacts on society, the economy and our environment.</p>	<p>Defra has national policy responsibility for flood and coastal erosion risk management and provides funding through grant-in-aid to the Environment Agency which supervises all matters relating to flood defence.</p> <p>Defra is undertaking a wide range of activities on flooding including:</p> <ul style="list-style-type: none"> • Action in response to Sir Michael Pitt’s Review of the 2007 summer floods. • The Draft Floods and Water Management Bill, which will give the Environment Agency a strategic overview role for all types of flooding in England.
<p>Changing weather patterns, particularly more frequent periods of dry, hot weather, may cause more frequent droughts, with impacts on water availability and water quality, which is also adversely affected by heavy precipitation and run-off, affecting the environment, society and the economy.</p>	<p>The Environment Agency has recently published its Long Term Investment Strategy for managing flood risk over the next 25 years.</p> <p>The Agency is also developing a tidal risk management plan for London and the Thames Estuary with its Thames Estuary 2100 project.</p> <p>Implementation of the Government’s Water Strategy ‘Future Water’ including:</p> <ul style="list-style-type: none"> • the first 25-year water resource management plan moving towards universal water meters in water stress areas by 2030, with the aim of reducing water usage to 130 litres per person per day.

Risk	Response to risk
<p>Changing weather patterns could alter crop yields and the types of crop which can be grown. There could be positive and negative impacts, depending on the sector, location, and period of time under consideration. There could also be a variety of other impacts on agriculture such as exotic animal disease, increased heat stress in livestock, increased pests and pathogens, ecosystem changes and loss of biodiversity to increased damage from storm, flood or drought.</p> <p>Decisions made on how to adapt to the changing climate might run counter to the objectives for sustainable development – for example, an adaptation action might lead to further environmental degradation, or have a disproportionate impact on a disadvantaged group.</p>	<p>Defra’s actions include:</p> <ul style="list-style-type: none"> • funding Farming Futures, which helps farmers to plan how to adapt to climate change; and • establishing a specific team to work on adapting to climate change in agriculture with a specific Agriculture and Climate Change workstream in the Farming for the Future Programme. <p>Addressing climate change is one of the four key priorities in Defra’s Sustainable Development strategy. Defra’s role is to ensure that options are genuinely sustainable – taking account of wider social, environmental and economic objectives, including the changing climate.</p>

Self-assessment against climate change risk assessment framework

Defra’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of Defra’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy			✓		
People				✓	
Partnerships			✓		
Processes		✓			

Leadership

Defra has 12 cross-cutting Board programmes, one of which is Defra’s work in leading the cross-Whitehall Adapting to Climate Change programme.

The Senior Responsible Owner for each programme is responsible for adaptation, integrating climate change risks into the programme for which they are responsible (as with all other risks) and escalating discussion of the risks to the Management Board in quarterly reports and, where necessary, monthly exception

reporting. The Director General for the Natural Environment Group chairs the cross-Whitehall Adapting to Climate Change Programme Board and sits on Defra’s Management Board.

There is no single person in Defra with specific responsibility for domestic climate change adaptation through all of Defra policy. The Department states that for adaptation to be effective, it needs to be mainstreamed and an issue for all policy areas and therefore responsibility rests with the Management Board collectively.

Policy and Strategy

Policy areas where adaptation and climate change risks are considered include biodiversity, marine, water availability and quality, flooding and coastal erosion and farming for the future. Initial risk assessments have been undertaken in several key policy areas, priority risks have been identified, and strategies and action plans are in place to address these risks.

Defra does not have an overarching strategy for its work on adaptation, but individual policy areas have strategies for addressing climate change risk and have set related milestones and objectives. Defra has acknowledged that there may be potential to ensure greater consistency on how risks are identified and managed.

The Estates Division was highlighted as an operational part of Defra that needed to manage climate change risks. The Division follows relevant guidance regarding flood risk and new development. Climate change adaptation is addressed by the Estates Division as part of a broad sustainability strategy. Defra's next Sustainable Development Action Plan will set out how it will systematically use a climate change risk assessment methodology across the Defra estate, and a timetable for implementation.

People

A Defra Adaptation Group at Director level meets every 12 weeks, chaired by the Senior Reporting Officer of the Adapting to Climate Change programme.

There is also a working level Defra Adaptation Network that meets on a more informal basis to discuss issues related to adaptation, and share information and best practice.

Each programme within Defra sets its own milestones and objectives, and several of these relate to adaptation. The teams and resources dedicated to adaptation across Defra have also grown in the last year. Training needs for staff have been identified, and the Projections in Practice Programme will hold events for all Defra staff from autumn 2009.

Partnerships

Key partners for Defra are as follows:

The Environment Agency – an Executive Agency sponsored by Defra, whose principal aim is to protect and enhance the environment and in doing so to make a contribution towards the objective of achieving sustainable development. The Agency has a broad range of functions covering areas such as pollution, waste management, water quality, fisheries and flood risk management.

Natural England – an independent statutory Non-Departmental Public Body, whose purpose is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Forestry Commission – the government Department responsible for the protection and expansion of Britain's forests and woodlands.

The Environment Agency, Natural England and Forestry Commission are all members of the Director-level Defra Adaptation Group and Network and members of the Farming for the Future project group. Defra has provided scrutiny of, and comment on, both Natural England's and the Environment Agency's corporate plans and strategy to ensure adaptation action is appropriately covered.

The **UK Climate Impacts Programme** (UKCIP) which helps coordinate scientific research into the impacts of climate change, and helps organisations adapt to unavoidable impacts. Defra contributes around £900,000 a year to UKCIP, and has a contractual arrangement with them for delivery of specific products.

The Met Office Hadley Centre which produces information about our future climate, including the new UK Climate Projections launched in June 2009, has been jointly funded by Defra, DECC and MoD (although funding arrangements are currently being restructured).

Government Offices which represent central government in the regions. An example given by Defra of the Government Offices' importance is their role in taking forward and encouraging regional action to implement the Farming for the Future programme.

Defra has identified the following sectors where it will be particularly important to work with others to identify and manage cross-sectoral risks: land-use planning with CLG, and infrastructure planning with the new Infrastructure Planning Commission.

Processes

Since April 2009, business cases for new activities in Defra or continuation for existing activities have been required to set out explicitly how climate change will impact upon the outcomes the activity will deliver.

A note has been commissioned on incorporating climate change adaptation into policy work for Defra's assurance account managers to use as they work with business areas. This work will also consider what Defra might need in terms of detailed guidance and/or prompts.

Defra has a policy cycle providing a common framework for policy making within Defra and effective management of risk is one of the main themes. Climate change is one of many policy risks mentioned in the supporting guidance, but it is not a specific section or prompt in the policy cycle framework. This may be an area for future enhancement of the guidance.

Specific Impact Assessments in Defra have considered climate change risks – for example, the Impact Assessments under the Floods and Water Bill considered the increasing risks from climate change, as part of the evidence on why action must be taken.

Defra does not currently have guidance or tools to help staff assess and manage climate change risks, but the Projections in Practice training programme will address this when it is rolled out in autumn 2009.

Department for Innovation, Universities and Skills (now part of the Department for Business, Innovation and Skills)

1 The Department for Innovation, Universities and Skills (DIUS) has identified three of its objectives that could be significantly affected by climate change:

- Accelerating the commercial exploitation of creativity and knowledge, through innovation and research, to create wealth, grow the economy, build successful businesses, and improve quality of life.
- Encouraging better use of science in Government, fostering public service innovation, and supporting other Government objectives.

- Strengthening the capacity, quality and reputation of the further and higher education systems and institutions to support national economic and social needs.

Key risks to departmental objectives from future climate change

2 DIUS believes that the risks from climate change are more significant in some areas of its work than in others – for example, they form a key part of its research and innovation activities. The Department has started to identify potential risks to a limited number of objectives only, but in a systematic way.

Risk	Response to risk
The changing climate could affect teaching patterns across the further and higher education sectors – for example, hotter summers.	None to date
The changing climate could disrupt science research – for example, hotter summers, or flooding.	The Government Office for Science recently completed work on the risks from flooding, and it will be examining food security in the future.

Self-assessment against climate change risk assessment framework

DIUS’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DIUS’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership	✓				
Policy & Strategy		✓			
People	✓				
Partnerships	✓				
Processes	✓				

Leadership

The Director of Innovation, who is on the DIUS Departmental Board, is the most senior official dealing with specific responsibility for adaptation. The Board has not considered how the Department should lead and manage its work on domestic climate change adaptation. No specific risks have been identified to be considered at Board level.

Policy and Strategy

DIUS has no specific plan for assessing and managing climate change risks. The operational parts of the Department that need to assess and manage climate change risks are:

- Further education colleges and universities.
- DIUS family estates, which is coordinated by the estates team in BERR on behalf of DIUS.

People

DIUS has a Sustainable Development Steering Group and a Sustainable Development Network, whose remit will be to consider the necessary actions on adaptation. No staff areas have responsibility for identifying and managing climate change risks written into their objectives. The Department is considering how it might offer suitable training in partnership with the Sustainable Development Commission.

Partnerships

Key partnerships will be with the Higher Education Funding Council for England (HEFCE) and the Learning and Skills Council. DIUS also sponsors bodies that are doing important work on the low carbon economy and climate change research, adaptation and mitigation such as the UK Commission for Employment and Skills, the Sector Skills Councils, the Technology Strategy Board, the Research Councils, and the National Endowment for Science, Technology and the Arts. It is also responsible for sponsorship of the Further and Higher Education system.

Processes

DIUS delivery partners have flagship programmes which specifically examine climate change issues. An example is the Living with Environmental Change programme, to which the leading contributor is the Natural Environment Research Council which is investing £237 million in the Comprehensive Spending Review period. The programme will provide an interdisciplinary research and policy partnership programme to increase resilience to – and reduce the costs of – environmental change. Eighteen targeted programmes involving a range of public bodies to address different aspects of climate change impact were announced on 8 June 2009.

Research activity is being designed to ameliorate expected shortfalls in water, food and energy resources, and to improve human health and make the economy more resilient to change.

DIUS has not yet reviewed its processes for planning new infrastructure to identify where climate change risks need to be taken into account.

Department for Transport

1 The Department for Transport (DfT) has identified three strategic objectives that could be significantly affected by climate change:

- Supporting national economic competitiveness and growth, by delivering reliable and efficient transport networks.
- Contributing to better safety, security and health, and longer life-expectancy through reducing the risk of death, injury or illness arising from transport, and promoting travel modes that are beneficial to health.
- Improving quality of life for transport users and non-transport users and promoting a healthy natural environment.

Key risks to departmental objectives from future climate change

2 DfT believes that the risks from climate change are significant to three of its five objectives. Nevertheless, it looks to embed adaptation into future transport planning rather than trying to 'rank' it in comparison with cross-cutting, wider risks. Its current assessment of climate change risk recognises that the reliable and efficient operation of transport networks may be vulnerable to a changing and/or changed climate. The Department recognises that transport also has interdependencies with other critical infrastructure such as energy and telecommunications.

Risk

Increased temperatures causing: roads, pavements and runways to melt; rail tracks to buckle; passenger safety and comfort to be compromised; and access routes (e.g. to ports and airports) to be cut off.

Increased rainfall causing: flooding of roads, rails and underground systems, (e.g. London Underground) subsidence of embankments; landslides onto roads and rail tracks; threats to passenger safety; and access routes (e.g. to ports and airports) cut off.

Response to risk

The Highways Agency has produced an Adaptation Strategy which, among other things, amends the specifications to which roads are built, resurfaced and maintained, so they are resilient to increased temperatures.

DfT is working closely with the rail industry in their work on adaptation, including looking at track specifications designed to withstand greater temperatures. Through DfT's Local Transport Planning Guidance, the Department is encouraging local authorities to take these risks into consideration when planning maintenance and new transport infrastructure in their areas.

DfT is in communication with the Greater London Authority (GLA), whose Adaptation Strategy seeks to address the risks of rising temperatures in the underground network.

The Highways Agency and rail industry are looking at improved drainage systems in order to be more resilient to increased rainfall. The Pitt Review of the 2007 floods is being used to learn lessons and determine how to deal with future major flood risks and events.

As above, DfT is encouraging local authorities to take these risks into consideration by including adaptation in the next round of Local Transport Planning Guidance.

Risk	Response to risk
<p>Increase in storms, rising sea levels, increase in coastal erosion and flooding, and storm surges causing: rail lines, power lines and trees to blow down; aircraft to be unable to take-off or land; closure or non-operation of ports; flooding in estuaries such as the Thames; and permanent or temporary inundation of coastal roads and railways.</p>	<p>Some ports could consider raising quaysides in preparation for an increased number of storm surges.</p> <p>The GLA's Adaptation Strategy looks at the risk and impacts of flooding in London caused by higher tides and the potential risk of storm surges.</p> <p>DfT is encouraging local authorities to identify the impacts on local transport infrastructure, which is especially relevant for those with a coastline.</p> <p>DfT is working closely with the rail industry in their evolving work on adaptation, including measures to protect or adapt sections of track which run parallel to the coast.</p>
<p>Extreme weather (e.g. heat waves, flooding and storm surges) causing loss of one or more transport modes leading to a breakdown of sections of the transport network and secondary disruption.</p>	<p>DfT is considering measures across all transport sectors so that the network can adapt to the risk of an increase in extreme weather events. This includes: the above mentioned Highways Agency strategy; Local Transport Planning Guidance; work with the rail industry; communications with the GLA regarding their strategy and approach; and sea ports could look to increase the height of sea walls.</p>

Self-assessment against climate change risk assessment framework

DfT's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DfT's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy			✓		
People		✓			
Partnerships		✓			
Processes		✓			

Leadership

The Board holds discussions on climate change mitigation and is aware of adaptation, but has not received a specific paper on it. However, Defra has presented to the DfT Executive Committee on UK Climate Projections and the

Department's senior management discussed adaptation at an away-day in June 2009. Mitigation risks have been considered at Board level and EU climate change measures are on programme risk registers. There are generic climate change risks on the Board's risk register.

Policy and Strategy

DfT's estate is being adapted through a joint project with Defra, and the operational parts of each transport sector are to be assessed and managed via the reporting power under the Climate Change Act. This requires reporting authorities to report on the risks posed to them and the adaptation measures they propose or already have in place.

All transport sectors are potentially affected, including roads, rail, aviation and ports. London's transport networks are a particular risk, given their vulnerability and their critical role in the overall operation of the UK. DfT has produced a carbon reduction strategy 'Low Carbon Transport: A Greener Future' (July 2009) as part of the Government's wider UK Low Carbon Transition Plan, to help mitigate transport emissions, and is working with Defra on adaptation via the Adapting to Climate Change Programme.

The Highways Agency has already used UK Climate Projections to identify threats and hazards to the UK's strategic road network (motorways and trunk roads) in its adaptation strategy. Network Rail has also used the data to inform adaptation decision-making.

People

Work on adaptation is being led by DfT's Environment Policy and Delivery Division and headed by the Director of Environment and International. A dedicated member of staff coordinates and manages the day-to-day work, including an internal steering group which has been established as a means of communicating the work to different divisions. DfT is currently working to achieve the milestones set out in the Climate Change Act through involvement in the cross-government Adapting to Climate Change Programme.

Most staff in the Environment Policy and Delivery Division have climate change mitigation and/or adaptation as the primary focus of their job objectives. Some staff in other divisions have climate change included in their objectives but in varying degrees based on progress in this subject area and staff capacity within their teams.

Partnerships

DfT works with: the Highways Agency on their adaptation strategy; local authorities, providing funding and guidance for future transport planning; the rail industry, especially Network Rail, providing funding and support; the Rail Safety Standards Board (RSSB), providing funding for research, which this year includes climate change adaptation; and the Office of the Rail Regulator (ORR), all of whom attend a regular forum set up by DfT for the rail industry and relevant stakeholders.

DfT's Director for Environment and International is the official chairperson of a new project board for a Government critical infrastructure and adaptation project. This project examines linkages between transport, energy and water infrastructure.

The Department sits on a steering group for a project on coastal erosion and flooding, which is examining how coastlines can be protected or adapted to the impacts of sea level rises and increased erosion, flood and storm damage.

Processes

DfT has recently undertaken a refresh of its transport appraisal system, New Approach To Appraisal (NATA) – see 'NATA Refresh: Appraisal for a Sustainable Transport System' (DfT, April 2009). NATA provides guidance software and data to support the analysis of the impacts of new transport proposals on the economy, environment and social welfare. It ensures that transport proposals are assessed for their impact on climate change. However, NATA does not currently include an assessment of the risks to the transport systems under appraisal from future climate change impacts. DfT uses Defra's climate change guidance, and will continue to do so as progress is made to take greater account of both mitigation and adaptation in the transport planning process.

Processes for funding rail infrastructure (via five-yearly High Level Output Specifications) are planned to include climate change adaptation from 2014, following research to quantify risks before then. Limited planning has already occurred in the area of drainage (relating to flood risk) which will be implemented in the current five-year period (2009-2014).

Department for Work and Pensions

1 The Department for Work and Pensions (DWP) has identified four strategic objectives that could be significantly affected by climate change:

- Reduce the number of children living in poverty.
- Maximise employment opportunities for all.
- Improve health and safety outcomes.
- Promote independence and well-being in later life, continuing to tackle pensioner poverty and implementing pension reform.

Key risks to departmental objectives from future climate change

2 During 2007, DWP commissioned the Meteorological Office to undertake a review of the impacts of climate change on its assets and operations. The review concluded that the Department did not have a clear picture of the current or future risks posed by weather sensitivity to its policies and services to customers. DWP intends to build upon this review to explore the risks in more detail, and to address those found to be most significant. The Department also plans to consider how climate change might affect risks that have already been identified. It has, for example, established that its business continuity plans need to address severe weather events, as these become more frequent.

Risk

The changing climate means hotter, drier summers and warmer, wetter winters. This might require a re-examination of thresholds for cold weather payments, and perhaps the introduction of a cooling-related hot weather payment.

The impacts of extreme regional weather, and potential increase in people failing to take out adequate insurance cover, might lead to an increase in demand for crisis loans.

Climate change might have a disproportionate impact on the vulnerable, who make up a large proportion of DWP's customers.

Response to risk

Following the initial scoping study, DWP awaits the publication of revised UK Climate Projections. Further work will then include the development of plans to address the risks.

As above.

As above.

Self-assessment against climate change risk assessment framework

DWP's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DWP's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership		✓			
Policy & Strategy		✓			
People		✓			
Partnerships		✓			
Processes	✓				

Leadership

There is ministerial level responsibility for Sustainable Development. DWP's Sustainable Development team manages the adaptation work, but responsibility for implementation across departmental policy rests with the relevant corporate area or business.

Policy and Strategy

DWP is waiting for the next set of UK Climate Projections before agreeing a plan. But initial scoping work has been undertaken, based on a specially commissioned report from the Meteorological Office.

People

The Director of Commercial Strategy and Development represents DWP on the Adapting to Climate Change Programme. Area Representatives across the organisation liaise with the Sustainable Development team.

Partnerships

All of DWP's executive agencies are represented on the Sustainable Development Delivery Group, who will be planning the programme of work. The Health and Safety Executive and the Child Maintenance and Enforcement Commission will also be given the opportunity to take part in this work. Telereal Trillium manages the Department's estate, and DWP has shared its scoping work with them, with a view to making adaptation integral to the future planning of estates.

Processes

The Department recognises that this is a key area for development. Business Continuity arrangements need to incorporate climate change, and the Department plans to tackle this as a matter of priority.

Department of Energy and Climate Change

1 The Department of Energy and Climate Change (DECC) has overall responsibility in Government for climate change mitigation and international negotiations on climate change, both mitigation and adaptation. DECC is working with the Department for International Development (DfID) on international climate change adaptation. Because this briefing is focused on domestic adaptation, this summary focuses on DECC's work to assess and manage risks to its objectives from future climate change impacts in England, and not its work on international climate change adaptation, nor its efforts to mitigate future climate change through policies to reduce greenhouse gas emissions. DECC leads on the cross-cutting Public Service Agreement 27 (PSA 27) to 'lead the global effort to avoid dangerous climate change' and works closely with Defra over its delivery. DECC reports to the Climate Change and Energy Delivery and Strategy High-level Board (DASH) on progress against PSA 27 regarding climate change mitigation. The cross-government Adapting to Climate Change Programme Board also reports to the DASH Board on adaptation.

2 DECC has identified that its three strategic objectives could be significantly affected by climate change:

- Climate change tackled internationally and through domestic action to reduce greenhouse gas emissions.
- To ensure the reliable supply and efficient use of clean, safe and competitively-priced energy.
- To manage energy liabilities effectively and responsibly.

Key risks to departmental objectives from future climate change

3 DECC has identified potential risks to a number of its objectives, and considers that climate change risks are significant in limited cases. In relation to domestic climate change adaptation, DECC considers the main risk it manages to be those to the domestic energy supply. Climate change risks have the potential to disrupt the continuity of energy supplies by creating consequences that are not covered by traditional risk management standards. Two particular examples would be flood risk affecting entire energy facilities, or the effects of sustained high temperatures on equipment ratings and reliability. DECC also recognises that its short term priority must be to ensure adequate capacity for, and supply of, oil, gas and electricity.

Risk	Response to risk
Increased severity of rainfall may increase the incidence of flooding and lead to the loss of a major electricity substation or gas/oil facility.	Considerable work has been done with the energy sector to identify risks and solutions. The sector has used existing UK Climate Projections for assessing future requirements.
Sustained very high temperatures, especially if coupled with very dry conditions, would cause electricity equipment to be downrated, leading to higher generation constraint costs and possibly equipment failure.	Sector companies are reviewing the possible consequences. DECC is working with the Energy Emergencies Executive Committee, a joint government and industry emergency planning body, to improve understanding of these risks and then manage their implications. DECC will also ensure that sector companies are aware of the new UK Climate Projections 2009.
Patterns of demand for energy could change, with an increased requirement for energy in the summer for cooling.	DECC is working with National Grid on their long term planning/outlook documents for industry, therefore, is considering this in partnership.
Clear experience of real climate change will provide a significant and positive impetus to adaptation measures.	No decision has yet been made on how to respond.

Self-assessment against climate change risk assessment framework

DECC's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DECC's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy			✓		
People			✓		
Partnerships			✓		
Processes		✓			

Leadership

Managing the risks of climate change, both domestically and globally, is core to the Department's mission, with leadership on efforts to mitigate climate change through reducing greenhouse gas emissions. DECC's main focus is therefore on mitigation measures. DECC's leadership is aware of the likely impacts of climate change and therefore the importance of adapting to climate change. The Chair of the cross-government Delivery Board for PSA 27 is on the DECC Management Board, and Board members attended briefings on the UK Climate Change Projections 2009. At a working level, adaptation issues are managed by policy leads.

Policy and Strategy

DECC has prioritised energy supply as the key area that needs to adapt to the risks from future climate change impacts and recognises that it needs to implement a more strategic approach to adaptation across its other policy objectives. The Energy Resilience team is working with the newly established Natural Hazards team in the Cabinet Office to mitigate risks to energy supplies from Natural Hazards. The Energy Resilience team is prioritising work on flood risks and the UK Climate Projections. DECC has a small estate (one building in London and two floors in Aberdeen) and its London building is managed by Defra under a contract that incorporates climate change considerations.

People

Energy Resilience staff have adaptation to flood risks written into their targets. DECC's staff are (by the nature of DECC's remit) keenly aware of climate change and the associated risks. Training events and talks are run to raise awareness, and specific events have been planned on climate change adaptation, for example, for the launch of the UK Climate Change Projections. DECC has not identified the need for coordination more widely across the Department on adaptation work.

Partnerships

DECC works in partnership with all key Departments through its chairmanship of the PSA 27 Delivery Board, and with other institutions such as the Carbon Trust, Energy Saving Trust and the Met Office Hadley Centre through its work on climate change mitigation. DECC's key partner within the energy sector for managing climate change risks is Ofgem, which has responsibility for the assessment and approval of energy companies' adaptation investment proposals. Companies in the energy sector and associated trade bodies also need to think about climate change risks, and DECC expects to work with others to address flood risks.

Processes

Risks to energy supply from future climate change impacts are captured as part of high level processes and management information such as Business Continuity Plans and risk registers. DECC also has processes to manage incidents and emergencies that could result in significant disruption to energy supplies, including a 24/7 emergency rota manned by trained personnel, that allow DECC to respond quickly to events, including those from natural hazards.

As a relatively new Department, DECC does not yet have more developed tools to integrate climate change risks into policy making, but is looking to update its processes following the publication of the UK Climate Change Projections.

Department of Health

1 The Department of Health (DH) identified that all three of its strategic objectives could be significantly affected by climate change:

- Better health and well-being for all: helping people stay healthy and well; empowering people to live independently; and tackling health inequalities.
- Better care for all: the best possible health and social care that offers safe and effective care, when and where people need it; and empowering people in their choices.
- Better value for all: delivering affordable, efficient and sustainable services; contributing to the wider economy and the nation.

Key risks to departmental objectives from future climate change

2 DH believes that it faces a small number of risks, but that these are significant. Its work to identify the impacts of climate change on health includes an adaptation assessment, and it is identifying vulnerable groups at which to direct future adaptation work. Key areas for health planning and monitoring purposes include: changes in infrastructure; plans and guidelines for weather related events; responses to flooding; and strengthening public health programmes. It has identified two main adaptation risks, as set out in the table below.

Risk	Response to risk
<p>Changing weather scenarios and extreme weather events such as heatwaves and flooding; varying health effects of migrating populations; and uncertainty of predictions making it harder to take strategic healthcare planning and delivery decisions.</p>	<p>National heatwave plans, which have been in place since 2004, with the latest published in May 2009.</p> <p>Department of Health and Health Protection Agency flooding guidance and the implementation of recommendations from the Pitt Review of the 2007 floods.</p>
<p>Failure to adequately embrace climate change adaptation requirements, such that healthcare services struggle to meet the needs of the population.</p>	<p>Two reports on the likely impact of climate change on the health of the population (2002 and 2008).</p> <p>Providers of NHS services are responsible for assessing the risks of climate change and taking appropriate action. Each organisation is likely to face unique circumstances and is responsible for meeting the requirements of the Climate Change Act and associated legislation. The Department has provided material including Emergency Preparedness Guidance, Heatwave Guidance, and a DVD of the Impact of the 2007 Floods.</p>

Self-assessment against climate change risk assessment framework

DH's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of DH's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership	✓				
Policy & Strategy	✓				
People		✓			
Partnerships	✓				
Processes		✓			

Leadership

Work on strategic adaptation to the risks of climate change is just beginning, and the Health Protection Agency is taking a greater lead in climate change and health issues. Climate change risks to DH's policy and expenditure programme are kept under active review within the framework of the Department's Risk Policy, and these are escalated for Board attention as appropriate.

DH has held in-house staff awareness-raising events on climate change risks and adaptation, the Government's Global Health Strategy and the Department's sustainable development strategy. These events have been accompanied by intranet pages, newspaper articles and pamphlets.

DH is supporting the development of programmes for the workforce, equipping them to take action on both reducing carbon emissions and on preparing for climate change. This includes:

Policy and Strategy

DH has no specific climate change adaptation plan. It has, however, contributed to the cross-Government Adaptation Policy Framework, with a webpage of actions being planned and taken within the Department.

- The development of an awareness, advocacy and action package on climate change, which will be delivered initially to all public health trainees, but over time across the NHS.
- Pump priming for the establishment of a new public health workforce initiative, which was launched in December 2008. Pilot networks have been established in the South West and North West, supported by a national network, Climate Connection.
- Ongoing explorations with the NHS Core Learning Unit about the development of a 'green' module for the NHS.

People

The Environment Hazards team within the Health Improvement & Protection Directorate coordinates a Climate Change Policy Forum, bringing together policy teams across the Department that are specifically affected by climate change. Objectives for staff within this team include reviewing the joint Department of Health/Health Protection Agency Climate Change Impact Assessment Report (2008) in the light of the 2009 UK Climate Projections.

DH is currently working with UKCIP to determine who should be trained to use their new climate projections.

Partnerships

DH's most prominent partnership is with the Health Protection Agency, which is co-author (with DH) of the Climate Change Impact Assessment Report, and provides emergency planning for extreme weather events, scientific advice and support. It is also taking a more prominent lead in climate change adaptation, and is in the process of recruiting climate change posts.

Additional key partnerships identified by the Department are with: other government Departments such as Defra for the cross-Government adaptation policy framework and Climate Change Act's National Climate Change Risk Assessment; DECC for aspects of international adaptation (DH leads on international work with the World Health Organisation); DWP for their work with vulnerable populations and addressing the potential increase in health inequalities because of climate change; private sector partners through the NHS capital development building programme; suppliers; and other independent providers of health services.

DH has identified the following areas where it will need to identify and manage cross-sectoral climate change risks: other government departments such as Defra, DECC, DWP, CLG and BERR through taking forward government policy on climate change; local authorities to implement Local Area Agreements; and various institutions for identifying and monitoring adaptation indicators.

Processes

DH does not include climate change risks when considering key policy and impact assessments. Some tools and guidance are in place, such as DH's guidance for adaptation and mitigation action in 'The health impact of climate change: promoting sustainable communities, 2008'.

Forestry Commission

1 The Forestry Commission is responsible for protecting, expanding and promoting the sustainable management of woodland, and increasing its value to society and the environment. Forestry is a devolved matter and so the structure of the Forestry Commission reflects differing responsibilities at both national and devolved levels. Forestry Commission Great Britain (FCGB) provides advice and support to the UK Government and to the devolved administrations in Scotland and Wales. Forestry Commission England remains part of the Forestry Commission, serving as the forestry Department of the Westminster Parliament, advising on, and implementing forestry policies in England. Through the executive agency, Forest Enterprise England, it also manages the public forest estate in England to deliver public benefits.

2 This annex focuses on the work of Forestry Commission England ('the Commission'), mirroring the scope of the Adapting to Climate Change Programme. Work at a Great Britain level is included only where particularly relevant to work in England, for example in providing strategic leadership and direction.

3 The Commission does not have specific Departmental Strategic Objectives. However, the Strategy for England's Trees, Woods and Forests sets the direction for forestry in England through the following aims:

- Provide a resource of trees, woods and forests in places where they can contribute most in terms of environmental, economic and social benefits.
- Ensure existing and newly planted trees, woods and forests are resilient to the impacts of climate change and contribute to the way in which biodiversity adapts to climate change.
- Protect and enhance environmental resources and the cultural and amenity values of trees and woodland.
- Increase the contribution that trees, woods and forests make to the quality of life of those living and working in, or visiting, England.
- To improve the competitiveness of woodland businesses and promote the development of new or improved markets for sustainable woodland products and ecosystem services where this will deliver identifiable public benefits, nationally or locally, including the reduction of carbon emissions.

Key risks to departmental objectives from future climate change

4 The Commission has started to identify potential risks to a limited number of objectives in a systematic way, and across all objectives as an initial exercise. It believes that climate change presents a significant risk to many of its objectives, and that the risks of climate change are viewed as an important and increasing priority as they may jeopardise the Commission's delivery function in the long term. It also sees a potential conflict between the need for climate change adaptation and some aspects of biodiversity and landscape policies that seek to maintain the status quo.

Risk	Response to risk
Climate change may have both negative and positive impacts on the suitability and productivity of individual species for commercial timber production.	Systems for choosing species now include climate change projections, and a climate change action plan for the public forest estate is being drafted. The Commission’s research agency, Forest Research, is exploring alternative species for commercial forestry that are likely to be resilient to climate change, and the balance of research funding has been shifted towards climate change issues. Draft climate change guidelines that underpin the UK Forestry Standard include a section on adaptation.
The increased frequency and severity of extreme climatic events (e.g. windstorms and extended summer droughts) could have a catastrophic impact on commercial plantation forests and native woodland habitats.	Support systems are available to aid wind hazard management. Forest Research is considering whether changes are necessary to the decision support system in response to likely indirect impacts of climate change. The new UK Climate Projections will enable more detailed risk assessments of the impacts of extreme climatic events to be made.
A hotter and drier climate will probably lead to an enhanced risk of forest fires.	The Commission is working with the UK Fire and Rescue Service and other interested stakeholders to improve outdoor fire monitoring and inform developing adaptation strategies. Fire management plans are already in place in Forestry Commission woodland.
The impacts of climate change will affect the range and distribution of native woodland flora and fauna.	Working with Natural England, a framework for managing frontier species in light of climate change projects has been developed.
The impacts of climate change, coupled with increased global trade, are likely to increase the risk of catastrophic pest and disease outbreaks, threatening semi-natural woodlands and production forestry.	Forest Research has been commissioned to review future pest disease threats. It is also investigating alternative species for commercial forestry to mitigate the likely future disease threat.
Climate change will present opportunities for tree and woodland resources to help society adapt to climate change by altering the physical environment of towns and cities, and providing a recreational resource able to absorb large numbers of visitors.	There has been a re-focusing of efforts towards the urban environment, in part to contribute to climate change adaptation through increased canopy cover. A number of initiatives have also been established to retain and plant large canopy trees to ensure that such a resource remains in place.

Self-assessment against climate change risk assessment framework

The Commission’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of Forestry Commission England’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership			✓		
Policy & Strategy			✓		
People		✓			
Partnerships			✓		
Processes			✓		

Leadership

In 2006 the Commission's Executive Board appointed a climate change policy lead, and climate change is one of four principal delivery areas. The Commission believes that climate change is embedded as a priority within its businesses and corporate planning processes. Climate change risks are discussed at Board level frequently and in an ad hoc manner.

Policy and Strategy

The Commission has a clear and agreed plan for taking forward its work on assessing and managing climate change risks. In 2009 it intends to draft a climate change action plan for the public forest estate. The Commission has also identified grant-aid and forestry regulations as policy areas that need to assess and manage climate change risks as a priority.

People

The Commission's work on climate change adaptation is coordinated at the UK and regional levels. At the GB level, activities are coordinated by the Climate Change Strategy Group, chaired by the Director General. In England, a group of policy specialists work together informally with specific initiatives and project documentation requiring sign-off by the Executive Board.

Partnerships

The Commission has published a Delivery Plan for the Strategy for England's Trees, Woods and Forests which details adaptation-related actions that have been agreed by approximately thirty organisations. The Commission works closely with Natural England, the Environment Agency and industry representative bodies. It also works closely with the Department for Communities and Local Government and the UK Fire and Rescue Services in relation to forest fire risks.

Processes

Policy appraisals and impact assessments for open habitats, the public forest estates, the UK Forestry Standards, and ancient and native woodland practice guidance have included the risks posed by climate change. In looking at the impact of climate change on re-stocking forests and woods, the Commission has identified areas where risks need to be taken into account. Assessment and management of risks utilises the Ecological Site Classification decision support system for species selection. The Commission is developing other tools to help create woodland in locations where it can contribute most to landscape scale adaptation.

Her Majesty's Treasury

1 The Treasury has identified two of its objectives that could be significantly affected by climate change:

- Ensuring high and sustainable levels of economic growth, well-being and prosperity for all.
- Maintaining sound public finances.

Key risks to departmental objectives from future climate change

2 The Treasury has started to assess climate change risks across all its objectives as an initial exercise, but recognises that there will be more to do in terms of identifying risks and deciding how to respond to them. It believes that the long term implications of significant climate change are very significant for the UK, particularly when considering impacts as a result of climate change around the world, as set out in the Stern Review.

However, it currently finds it difficult to judge the relative significance of domestic climate change impacts in the UK compared to other potential long term impacts.

3 Current problems include uncertainty over the total economic impact compared to other pressures, and difficulty in judging the extent to which autonomous adaptation – without government intervention – could reduce these impacts. There is also limited evidence available on the potential public finance impacts.

4 Two key risks, and the Treasury's responses, are set out in the table below. In addition to risks resulting from domestic climate change impacts, the Treasury also highlighted that there are risks associated with UK international policy such as disaster relief. Consideration of these is outside of the scope of this briefing, which focuses on domestic climate change impacts and risks.

Risk

Changing climate affects UK economic growth and welfare. The impact could be positive or negative depending on the scale of change and cost of adaptation measures, and the exact nature of impacts will vary by sector and location. There may also be impacts as a result of changes such as fluctuations in global commodity prices affecting UK inflation.

The changing climate imposes new or increased costs on the UK public sector – for example, for flood defences, health services or costs of response to extreme events.

Response to risk

The Treasury has been working with Defra to develop supplementary guidance on adaptation for the Green Book which was published in June 2009.

However, to a large extent the Treasury is awaiting the UK Climate Change Risk Assessment and Economic Analysis in order to inform further consideration of climate change risks and policy development.

Some decisions have already been made as a result of exposure to the current climate, but the Treasury recognises that there is more to do. It expects that spending pressures arising from climate change would be considered as part of the usual processes for the control and review of public spending, including in future Spending Reviews.

Examples of existing decisions on public spending influenced by climate change include provision of additional resources for flood and coastal erosion in the last Comprehensive Spending Review; and collaboration with the insurance industry to ensure flood insurance continues to be as widely available as possible.

Self-assessment against climate change risk assessment framework

The Treasury’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of HM Treasury’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership		✓			
Policy & Strategy		✓			
People	✓				
Partnerships	✓				
Processes	✓				

Leadership

Policy responsibility falls within the remit of the Energy, Environment and Agriculture team, along with other aspects of the environment, energy and climate change agenda, and flood risk management. The Director, Environment is therefore responsible for adaptation, but is not on the Treasury’s Board.

Climate change risks have not been considered at Board level. However, a Senior Civil Service level Environment Steering Group within Treasury has identified the need for a workstream on adaptation to consider further issues arising from assessments so far.

Policy and Strategy

The Treasury does not have a clear and agreed plan for taking forward its work on assessing and managing climate change risks. Particular policy areas that need to assess and manage climate change risks are the Energy, Environment and Agriculture team including those involved with Defra spending control (including policy responsibility for floods). No priority operational issues arising from climate change impacts have been identified at the present time.

People

Work on domestic climate change adaptation is coordinated within the Energy, Agriculture and Environment team. Taking forward work on adaptation is likely to be part of the forward objectives of the team in 2009-10.

In terms of training needs, a seminar is planned on the new UK Climate Projections and the supplementary guidance for the Green Book on adaptation, to make Treasury teams aware of climate change impacts and how they should consider them in policy making. In addition, an internal training course on environmental policy is being developed, and the Treasury is considering whether and how to expand it to cover adaptation issues.

Partnerships

The Treasury does not believe any of the public bodies it sponsors has a particularly important role in assessing and managing climate change risks. The Office of Government Commerce (OGC), an independent Office of the Treasury, has a role to play and is working closely with Defra to see how the Government can lead by example in adapting to the impacts of climate change. The Treasury has not identified any areas where it needs to work with others to identify and manage cross-sectoral climate change risks.

Processes

In terms of processes for policy analysis, the Treasury identified future climate impacts as an issue in supporting analysis for the 2007 Comprehensive Spending Review. Particular work for the Review included an assessment of future flood risk and resulted in additional resources being allocated to flood defences. Supplementary guidance for the Green Book will be relevant to the development and appraisal of business cases across all Departments, including the Treasury itself.

Home Office

1 The Home Office has identified ‘*Securing our borders and controlling immigration for the benefit of our country*’ as an objective that could be significantly affected by climate change.

immigration and the possibility of increased migration, both legal and illegal, to the UK as a result of international climate change. The Department will decide how to respond to this risk once it has undertaken an analysis of impact and likelihood.

Key risks to departmental objectives from future climate change

2 The Home Office undertook an initial exercise to identify potential risks across its objectives. The key risk identified relates to

Risk	Response to risk
Rising sea levels and other climate-related changes could make other parts of the world less habitable, leading to increased migration to the UK, both legal and illegal. The range of potential impacts includes increased pressure on services and resources, illegal working, increased asylum claims, and the inability to return people to certain countries. There could also be knock-on effects on crime (to be considered in more detail, but not thought serious enough currently to represent a major risk to the Home Office’s objectives on reducing crime).	None as yet.

Self-assessment against climate change risk assessment framework

The Home Office’s assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of the Home Office’s self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership	✓				
Policy & Strategy	✓				
People	✓				
Partnerships	✓				
Processes	✓				

Leadership

The most senior individual with specific responsibility for adaptation within the Department does not sit on the Home Office Board. The Board has not considered how the Home Office should lead and manage its work on domestic climate change adaptation, although Sustainable Development is dealt with at Board level. The risk of adverse migration flows is considered by the Board on a quarterly basis, but it is not currently specifically linked to a climate change cause. Once the likelihood and impact of climate change in relation to this and other risks have been assessed, recommendations on Board discussion will be considered.

Policy and Strategy

The Home Office does not yet have a clear and agreed plan for assessing and managing climate change risks, but has identified migration as a potential key risk area. The UK Border Agency has started work with the Government Office for Science, on a Foresight project to look at global migration due to environmental change. The main aim of this project will be to use science and technology, as well as other disciplines, to help understand how to manage and prevent the multiple global impacts of this migration over the next five decades. Once the Home Office has established what the potential impacts are likely to be, it will be able to fully identify particular operational parts of the organisation that need to assess and manage climate change risks as a priority.

People

Initial work is being coordinated in the Shared Services Directorate. Staff from across the Home Office's business areas have been included in this work. Staff working within areas that have been identified as being affected by climate change risks do not have responsibility for identifying or managing climate change risks written into their objectives. Key staff will undertake training on Defra's climate projection models and make use of software analysis tools offered by Defra, when they become available.

Partnerships

Home Office Headquarters works closely with the UK Border Agency, and has already involved the Agency in discussions about the risks that climate change poses to immigration. The Department has not identified any significant areas where it will need to work with others to identify and manage cross-sectoral climate change risks.

Processes

The Home Office has not yet considered climate change risks in its impact assessments and key policy appraisals. It does not have any specific planning considerations for infrastructure but intends to develop these. The Department plans to use available tools from Defra, and to use any centrally provided guidance.

Ministry of Defence

1 The Ministry of Defence's (MoD's) principal objectives are to defend the UK and its interests, and to strengthen international peace and stability. The MoD has a Strategy on Climate Change³⁸ that covers the adaptation of Defence policy planning, equipment and estate. Because this report is focused on domestic adaptation, this annex focuses on the section of the strategy concerned with adaptation of the built elements of the Defence estate. It does not address MoD's work in relation to global threats to security which may arise from climate change, or work to adapt their equipment. The strategic objectives for the Defence estate that could be affected by climate change are to:

- have an estate of the right quality, that efficiently and effectively meets military need and raises the quality of life for users.
- develop Defence communities where civilian and military personnel and their families wish to live and work, both now and in the future.
- integrate the Government's overarching objectives for sustainable development, whilst ensuring the delivery of Defence capability.
- manage and develop the estate in line with best practice, and foster a culture of continuous development and improvement.
- deliver improvements to the Defence estate in a sustainable manner, improving its fitness for purpose and condition.
- improve health, safety and environmental performance.

Key risks to departmental objectives from future climate change

2 The MoD has identified potential risks to a limited number of objectives in a systematic way, and across all objectives as an initial exercise. It considers that risks from climate change are likely to be significant across most of its objectives for the estate, and its support of military requirements. Climate change has the capacity to affect living and working conditions, the ability to provide facilities for routine and pre-deployment training, the health and safety of contractors, and business continuity. The MoD believes that the following risks are most significant.

Risk	Response to risk
<p>Changing weather patterns (especially more frequent extreme weather events and long term changed trends) could affect the efficiency of infrastructure, investment programmes, working conditions and military training provision (e.g. flooding, terrain unable to support vehicles, and IT affected by heatwaves).</p>	<p>MoD is developing a Climate Impacts Risk Assessment Method to maintain the operational capacity of the estate by identifying the effects of climate change so that they can be managed. This is using existing UK Climate Projections, but new projections will be incorporated when they are available. MoD is due to complete development of the Method by the end of 2009, and the methodology will be available for roll-out to key sites on the estate from 2010.</p>
<p>Faster rates of coastal erosion and continuing sea-level rise could diminish the ability to provide coastal training ranges, port infrastructure and associated training areas. There is an opportunity to develop more efficient sites, able to take advantage of infrastructure that can cope with new risks.</p>	<p>Work has been undertaken on some coastal erosion and flood issues. Others will be addressed using the Risk Assessment Method. MoD is engaging in consultation on the Draft Floods and Water Bill.</p>
<p>Infrastructure may not be of sufficient quality to cope with new extremes of temperature and prolonged weather events, and with increased demand for military aid to civilian authorities as a consequence of climate changes.</p>	<p>Transport implications will be included as part of the Risk Assessment Method. The possibility of aid to civilian communities is built into departmental contingency planning.</p>
<p>Changes to the habitat space available for wildlife could lead to impacts on the MoD's legislative commitments to biodiversity. The historic estate will be at increased risk of degradation from higher humidity, storm damage, subsidence, etc.</p>	<p>MoD is engaging with appropriate authorities for its responses to this risk. Its existing estate management mechanisms are able to integrate adaptation management needs as they are identified and agreed.</p>
<p>Responding to the changes in risks and emergency events may draw resources away from planning longer term improvements.</p>	<p>The possible impact of this risk is so uncertain that it will be dealt with as a business continuity matter.</p>

Self-assessment against climate change risk assessment framework

The MoD's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of the MoD's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership		✓			
Policy & Strategy			✓		
People		✓			
Partnerships			✓		
Processes			✓		

Leadership

The 2nd Permanent Under Secretary, who sits on the Defence Board, is the overall Sustainable Development Champion, and chairs the Defence Environment and Safety Board (DESB), which is a sub-committee of the Defence Board.

The DESB's responsibilities include climate change adaptation. Climate change and the adaptation of the defence estate is considered as a risk alongside all other Sustainable Development and Defence risks. The initial scoping of issues and Climate Impact Risk Assessment Method development work has been undertaken by Defence Estates (on behalf of the Department). The wider MoD Climate Change Strategy is signed by the Secretary of State, Chief of Defence Staff and Permanent Under Secretary.

Policy and Strategy

MoD has identified in its Climate Change Strategy the three business areas that need to address climate change adaptation risks – Estates, Policy Planning and Equipment. Policy development is most advanced in the area of estates adaptation.

People

A central team – the Climate Change Policy Review Group – coordinates adaptation work across the Department, and actions are set and reported against in the annual MoD Sustainable Development Report and Action Plan. As part of this focus, specialist staff in Defence Estates are developing the estate Climate Impacts Risk Assessment Method. A draft set of sustainable development competencies is being compiled, which includes climate change. These competencies will be the basis of objective setting for a wider pool of staff.

MoD has identified training needs for staff, and has included climate change adaptation in the generic training packages that Defence Estates has rolled out. The Risk Assessment Method project outputs will provide materials to aid implementation.

Partnerships

Key partners are the Meteorological Office, which supports the MoD in planning its exercises and operations, and key contractors with whom climate change risks and adaptation are discussed regularly. Adaptation issues will form a key part of the specifications and management of the Next Generation of Estate Contracts (currently being designed).

MoD will also need to work with other organisations which have interests in aspects of its estates management (e.g. in relation to biodiversity, heritage, water and construction).

Processes

MoD's Sustainability Environmental Assessment Tools Handbook requires consideration of climate change effects and, along with the Risk Assessment Method, provides guidance to help staff assess and manage climate change risks.

Ministry of Justice

1 The Ministry of Justice (MoJ) was created in May 2007, bringing together responsibility for the justice system – the courts, tribunals, prisons and probation services. MoJ identified three strategic objectives that could be significantly affected by climate change:

- Deliver fair and simple routes to civil and family justice.
- Protect the public and reduce reoffending.
- Provide a more effective, transparent and responsive criminal justice system for victims and the public.

Key risks to departmental objectives from future climate change

2 MoJ, with contributions from its agencies Her Majesty's Land Registry and The National Archives, believe that climate change risks are significant in relation to a small number of its objectives, as set out in the table below. It recognises that the scale and diversity of its estate is its most significant challenge.

Risk	Response to risk
<p>Departmental buildings may become unfit for purpose if subjected to flooding, storm damage or subsidence. This could lead to unusable prisons, courts, tribunals and probation centres.</p>	<p>All new and refurbished courts are required to have floor levels above the 1:200 year flood risk level plus the global warming allowance of 20 per cent.</p>
<p>There may be disruption to business efficiency in courts, tribunals, prisons and probation centres as increased and prolonged temperatures lead to poorer building performance and poorer working conditions, affecting court efficiency and concentration. This could lead to more case adjournments, delays in bringing cases to court, and increased waiting times. In turn, there might be civil unrest, increasing crime rates and prison riots, creating additional pressures on these frontline services.</p>	<p>Using more natural ventilation, shading and natural cooling linked to a Building Management System in existing and new courtrooms, offices and prisons.</p> <p>Improving performance against Sustainable Operations on the Government Estate (SOGE) targets has focused more on mitigation than adaptation, but ensures action to reduce energy consumption, to rollout an environmental management system, and to reduce vehicle emissions.</p>
<p>Localised flooding may disrupt business efficiency in courts, tribunals, prisons, and probation centres, by preventing accessibility and disrupting transport networks.</p>	<p>Upgrading of existing courts to increase high security, terrorist/civil unrest capacity. New high security court provision is planned as a contingency if and when required.</p>
<p>There could be substantial disruption to new prison and court building programmes from flooding, subsidence and storm damage, which would affect expansion of prison places and court buildings, leaving insufficient spaces for an expanding offending population.</p>	<p>Courts, tribunals, prisons, and probation centres have localised travel plans identifying access routes to all public buildings.</p> <p>All new and refurbished courts are required to have floor levels above the 1:200 year flood risk level plus the global warming allowance of 20 per cent.</p>
<p>Flooding, storm damage and subsidence may jeopardise the protection of, and accessibility to, historic paper records. Biodiversity sites could also be adversely affected.</p>	<p>Flood prevention and mitigation forms part of disaster planning, and business continuity and major incident plans are in place in key areas.</p> <p>A biodiversity action plan is in place to safeguard biodiversity on the estate.</p> <p>Research has commenced into the various effects of rising temperature and humidity on records and archives and mitigation techniques.</p>

Self-assessment against climate change risk assessment framework

The MoJ's assessment of its progress in managing climate change risks, under the five themes of Leadership, Policy & Strategy, People, Partnerships and Processes is summarised in the table below and set out in more detail in the following narrative.

A summary of MoJ's self-assessment

	Level 1 Getting Started	Level 2 Awareness & Understanding	Level 3 Implementation Planned and in Progress	Level 4 Implemented in all Key Areas	Level 5 Embedded & Improving
Leadership	✓				
Policy & Strategy	✓				
People	✓				
Partnerships	✓				
Processes	✓				

Leadership

The Director General (Finance and Commercial) is the most senior individual responsible for adaptation. No specific risks are considered regularly at Departmental Board level and, while some business areas have begun work on the risks posed by adaptation, a view across the Department as a whole has not yet been taken. MoJ has recently established an Estates Adaptation and Climate Change Steering Group, which is in the process of agreeing its terms of reference and composition.

Policy and Strategy

MoJ has no formal organisation-wide plan for assessing and managing climate change risks, although some core business areas have made progress.

People

In the areas of MoJ where climate change risks are relevant, staff objectives often do not cover the management of these risks. Two core business areas have identified the need for training in how to identify and manage climate change risks, but no training activities have yet been arranged.

Partnerships

MoJ has begun to identify partners, such as landlords and other building occupiers, with whom it needs to work. Individual core businesses will need to assess the climate change risk to their operations. Some have already commenced this work, while other areas have not yet begun.

Processes

MoJ has not considered climate change risks in policy appraisals and impact assessments to date. Similarly, it has not planned infrastructure changes or developed tools and guidance to assess and manage climate change risks, although it intends to use the new UK Climate Projections and associated training to determine the way forward.

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