



House of Commons
Environmental Audit
Committee

**Adapting to Climate
Change**

Sixth Report of Session 2009–10

*Report, together with formal minutes, oral and
written evidence*

*Ordered by the House of Commons
to be printed 16 March 2010*

HC 113

Published on 25 March 2010
by authority of the House of Commons
London: The Stationery Office Limited
£0.00

The Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

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Summary

Regardless of how successful we are in efforts to reduce emissions of greenhouse gases, climate change will affect people, business and public services in the future. In the UK, and in other developed countries, adaptation to climate change has been given only a fraction of the attention that has gone into reducing greenhouse gases. The need to adapt to climate change is poorly understood by the public, much of business and many in the public sector. The Government must build awareness and support for the wide-ranging and urgent programme of action that is needed. It must make it clear, that if we are to protect people, property and prosperity and safeguard the natural environment, adapting to climate change is at least as essential as cutting greenhouse gas emissions.

The Government recognises its work on adaptation is at an early stage. The capacity to manage climate change risks varies across Whitehall, but improvements are being made, with Defra and the Environment Agency demonstrating leadership. Over the last two years the Government has put in place a new policy framework that compares well with arrangements in other countries. The framework is helping to identify the main climate change risks the country faces. The challenge is to improve the understanding of these risks, and build capacity at all levels of government and in the private sector to tackle threats and exploit opportunities. Joint-working within and across sectors is needed to establish coherent plans and take efficient and effective action.

Climate change impacts will vary considerably from location to location and it is at the very local level that many decisions and actions need to be taken. Government departments and other public bodies should enable local communities to take action to address the risks they face.

Adapting to climate change is expensive. But if we do not take action now, adaptation is likely to become even more expensive, and we will impose greater burdens on future generations. The Government must address the question of how the costs of adaptation should be shared between current and future generations. The taxpayer will bear some of the costs but additional sources of predictable and sustainable funding are needed. Communities and individuals have been willing to pay, for example for flood defences when they have understood the reasons for action, and have been involved in deciding what should be done.

The Government, and the country as a whole, face difficult choices. There are trade-offs between policy objectives and adaptation actions. It is not possible to address all climate change risks. Decisions have to be taken on what and who should be protected from the impacts of climate change. Those who are worst affected by climate change, such as those who lose their homes, may need public support. The Government should make clear the limits of public liability: doing so will encourage people to take action to address the risks they face.

The planning system has a key role in adapting the built environment. New developments should only be approved if they are suited to future climates and do not increase risks to others. Developers should be required to make a greater contribution to improving the

general resilience, and thus the sustainability, of communities.

While the planning system addresses new homes, existing homes also need to be adapted so they are habitable and comfortable during hotter summers and better protected against the increasing risk of flooding. The Government should strengthen incentives for people to adapt their properties and should help them take action. Local agencies should be enabled to provide integrated retrofitting programmes covering adaptation, water efficiency and energy efficiency.

Since 2008, the Government has made good progress in laying the foundations for action on adaptation. The Government must build on current momentum and encourage and support all levels of government, business and the general public to respond to climate change risks. Uncertainty over the impacts of climate change is not a reason for inaction or delay. The country needs to respond flexibly to the risks we face. The Government will need to move quickly to strengthen its new policy framework if it does not lead to the urgent action that is now required. It is vital that we give much more attention to adaptation.

1 Introduction

Background

1. Changes in our climate are now unavoidable. Most of the changes that will happen over the next 30 to 40 years have already been determined by past and present emissions of greenhouse gases.¹ We have to adapt to the changing climate. The scale and nature of adaptation action will depend on the sensitivity of climate systems to emissions, future levels of greenhouse gas emissions, and the impacts of climate change on society, the environment, business and the economy.²

2. In the future the UK will experience warmer and wetter winters and hotter and drier summers. The incidence of extreme weather events will increase.³ Heat waves in the summer will affect people's health but there will be fewer deaths due to cold in the winter. Climate change will also affect biodiversity and the yields from crops.⁴ The impacts of climate change will vary across the country. Urban areas in the south are likely to need to plan for increased heat waves, while areas in the north could see enhanced opportunities for tourism.⁵ We are likely to experience knock-on effects from the impacts of climate change in other parts of the world, such as changes in the security and the supply of food and raw materials, political stability, and patterns of migration.⁶

3. Future changes in climate are likely to compound the already high cost of weather related disruption. During the floods in summer 2007, 13 people lost their lives and around 48,000 homes and 7,000 businesses were flooded.⁷ The floods caused more than £3 billion of insured damage and the total disruption to the economy was far greater.⁸

4. Adapting to climate change is the process of building the resilience of households, businesses, infrastructure, public services and vulnerable parts of our society. It is about preparing them for the impacts of climate change, and giving them the best chance to exploit any new opportunities that may arise. It includes:

- building adaptive capacity—creating the information and conditions (regulatory, institutional, managerial) needed to support adaptation; and
- delivering adaptation actions—taking specific steps to reduce vulnerability to threats arising from climate change and exploit opportunities.⁹

1 Defra, *Adapting to climate change: UK Climate Projections*, 2009

2 UKCIP, Defra and the Environment Agency, *Climate adaptation: Risk, uncertainty and decision-making—UKCIP Technical report*, 2003

3 Defra, *Adapting to climate change: UK Climate Projections*, 2009, pp ii, 1

4 Defra, *Adapting to climate change in England: A framework for action*, 2008, pp 14–15

5 Defra, *Adapting to climate change: UK Climate Projections*, 2009, p 22

6 National Audit Office, *Adapting to climate change*, 2009, para 1.6

7 Defra, *Adapting to climate change in England: A framework for action*, 2008, p 8

8 Ev 187

9 HM Treasury, *Stern Review: The economics of climate change*, 2006, p 405

5. Adaptation requires an on-going and wide ranging programme of action in areas such as agriculture, the natural environment, public health, the built environment and flood management.¹⁰ The country needs to invest in resilient infrastructure.¹¹ We need to improve the condition of existing habitats to increase the resilience of the natural environment.¹² People need to change their behaviour, for example by consuming less water.¹³ Plans on how to respond to extreme weather events need to be regularly reviewed. Homes and other buildings have to be designed or adapted so that they are habitable and comfortable during hotter summers and better protected against the increasing risk of flooding.¹⁴

6. Some adaptation will occur as organisations and people respond to market or environmental changes.¹⁵ But uncertainty over the impacts of climate change, and the long-term planning and investment needed to address some impacts, can deter organisations and individuals from taking action. The Government can help address barriers to adaptation by raising awareness, providing good quality information and assisting organisations and individuals to act.¹⁶ Adaptation is a flexible and dynamic process. Organisations and individuals may need to change their responses to climate change as new information on risks and impacts emerges.¹⁷

Scope of this inquiry

7. In this inquiry we examined the extent to which the Government is embedding climate change adaptation, and management of risks from future climate change impacts, into government programmes, policies and decision making, and into those of the wider public and private sectors.¹⁸ We examined how well the Government is tackling the key questions on adaptation, including:

- How well have we understood and quantified the risks from climate change, and do we know enough to decide what risks we should accept, and what risks we should seek to mitigate?
- How can we create the conditions for the urgent and wide-ranging action that is required on adaptation?
- What is the correct balance between encouraging and supporting action to tackle climate risks, and requiring or mandating individual departments, wider public sector bodies and private sector organisations to take action?

10 National Audit Office, *Adapting to climate change*, 2009, Figure 8

11 Ev 120

12 Natural England, *The Natural Environment, Adapting to climate change*, 2008, p 7

13 Defra, *Adapting to climate change: UK Climate Projections*, 2009, p 36

14 Defra, *Adapting to climate change: UK Climate Projections*, 2009, p 38

15 HM Treasury, *Stern Review: The economics of climate change*, 2006, p 403

16 Defra, *Adapting to climate change: Analysing the Role of Government*, 2010, pp 17–19, 58

17 Defra, *Adapting to climate change: Analysing the Role of Government*, 2010, p 65

18 Adaptation is a devolved issue, and this inquiry covered government policy and programmes for England and the UK for reserved matters.

- How do we ensure that adaptation is adequately resourced now, given the wider pressures on budgets and the natural tendency of organisations and individuals to focus on activities that deliver immediate benefits?
- How do we define the public liability for climate change in a way that assists those hardest hit by the impacts but simultaneously controls costs, and encourages people and organisations to take responsibility for addressing the risks they face?
- How should the burden of adapting to climate change be shared between the current population, and future generations? It is clear we should bear the cost of reducing greenhouse gas emissions, as past emissions and current emissions impact negatively on future generations. For adaptation, there is a genuine dilemma over how to apportion the responsibility fairly across generations.

8. We would like to thank all those who gave evidence to our inquiry,¹⁹ and in particular Dr Merylyn Hedger our specialist adviser. The Royal Commission for Environmental Pollution has been conducting a study on *Adapting Institutions to Climate Change*. The Commission will publish its report on 30 March 2010.

¹⁹ Those who gave evidence are listed on pages 42 to 43

2 The Government's response to the adaptation challenge

The Climate Change Act 2008 and the policy framework

9. Adaptation to climate change has received much less attention than mitigation.²⁰ The Secretary of State for the Environment, Food and Rural Affairs told us that:

Trying to stop climate change getting worse has for very understandable reasons received a great deal of attention and learning to live with the climate change that is coming anyway has not, although I think that is beginning to change, both because of the adaptation provisions of the Climate Change Act and the framework that has been put in place [...]²¹

Professor Robert Watson, the Department for Environment, Food and Rural Affairs' (Defra) Chief Scientific Adviser, said that it had only been in the last three to four years that adaptation had become a major political issue within the international community.²²

10. In 1997, the Government established the UK Climate Impacts Programme (UKCIP) to help organisations to generate the information they needed to plan their own response to climate change impacts.²³ Some organisations and sectors, such as the Environment Agency and the water industry, responded and reflected adaptation in their plans and procedures, but elsewhere progress on adaptation has been slow.²⁴ UKCIP told us that despite the UK being ahead of many developed countries, there was not yet sufficient understanding or appreciation of the need for adaptation.²⁵ Consumer Focus believed that the public remained unaware of some of the main ways climate change would affect their way of life and how they might have to adapt.²⁶

11. The Climate Change Act 2008 established a statutory framework for adaptation. It requires the Government to undertake a Climate Change Risk Assessment by 2012 and then set out a statutory National Adaptation Programme.²⁷ The Act established the Adaptation Sub-Committee of the Committee on Climate Change as a source of independent expertise and scrutiny on adaptation.²⁸ The Act also enables the Government to require public bodies and statutory undertakers, such as energy and water companies, to report on how they are adapting to climate change.²⁹ In 2009, the Government decided that

20 Q 242

21 Q 267

22 Q 280 [Professor Watson]

23 Ev 27

24 Ev 18, Ev 29 and Ev 93

25 Ev 30

26 Ev 147

27 National Audit Office, *Adapting to climate change*, 2009, para 5

28 National Audit Office, *Adapting to climate change*, 2009, para 12

29 National Audit Office, *Adapting to climate change*, 2009, para 11

departments should report publicly on how they were assessing and managing the risks from climate change to their policies, programmes, and estates. The first Departmental Adaptation Plans are due to be published shortly. They will inform the Climate Change Risk Assessment.³⁰

12. The cross-government Adapting to Climate Change Programme was created in 2008, to drive forward work in government and the wider public sector on adaptation in England and the UK for reserved matters.³¹ Within the Programme work is still at an early stage.³² However, the Environment Agency told us that the “[...] profile of adaptation policy has progressed significantly over the last two years, due largely to the statutory provisions in the Climate Change Act and the work of the Government’s Adapting to Climate Change Programme.”³³ In 2009, the Partnership for European Environmental Research compared national adaptation strategies in Europe. They concluded, that “[...] the United Kingdom [is] a frontrunner country in many respects [with] a comprehensive approach, strong scientific and technical support, attention to legal framework, implementation and review.”³⁴ The Tyndall Centre for Climate Change Research said the Government’s policy framework was “[...] encouraging on paper but [...] it is early days and we will need to see how it will develop in practice”.³⁵

13. The Climate Change Act 2008 and the establishment of the Adapting to Climate Change Programme should bring about a step change in the level of attention adaptation receives. The Government should establish a coherent approach to adaptation across all levels of government and enable and encourage businesses and private individuals to adapt where necessary. **The UK’s adaptation policy framework compares well with arrangements put in place in other countries. The Climate Change Act 2008 has, however, introduced a complicated assessment and reporting regime. Its complexity has been increased by the introduction of Departmental Adaptation Plans. It remains to be seen if this regime will improve the current low levels of awareness and understanding of adaptation. The Government must act quickly to revise the regime if it does not lead to the urgent action that the public and private sectors need to take on adaptation.**

14. The Adaptation Sub-Committee told us that “Many aspects of society today assume an unchanged climate”.³⁶ If the UK is to adapt we need to first understand the main threats and opportunities that climate change could bring, and then decide what climate change risks to bear, and what risks to mitigate. The Stern Review on the Economics of Climate Change concluded that more quantitative information was needed on the costs and benefits of taking adaptation action across the economy.³⁷ The Climate Change Risk

30 Ev 121

31 National Audit Office, *Adapting to climate change*, 2009, para 6

32 Ev 116

33 Ev 82

34 Partnership for European Environmental Research, *Europe Adapts to Climate Change: Comparing National Adaptation Strategies*, 2009, p 19

35 Q 222 [Dr Rayner]

36 Ev 109

37 HM Treasury, *Stern Review: The economics of climate change*, 2006, p 410

Assessment aims to fill this gap by assessing the risks and opportunities from current and future climate change.³⁸ An Adaptation Economic Analysis, which aims to identify the overall costs and benefits of adaptation to the UK economy, is being undertaken alongside the first Climate Change Risk Assessment.³⁹ The Government says the Climate Change Risk Assessment and the Adaptation Economic Analysis will enable it to:

- compare the risks of a changing climate with the other pressures it faces;
- prioritise adaptation policy geographically and by sector; and
- support the case for resources for adaptation.⁴⁰

15. In addition to the direct impacts of climate change, the UK is also likely to experience knock-on effects from the impacts of climate change in other parts of the world.⁴¹ The Government has commissioned some research on these impacts, including detailed research on the impacts of environmental change on migration.⁴² In line with its obligations under the United Nations Framework Convention on Climate Change, the UK is also assisting developing countries to address the impacts of climate change.⁴³

16. Responding to climate change impacts, such as threats to water quality and the increased risk of surface water flooding, requires cross-agency and cross-sector working. For example, in areas such as critical national infrastructure, flooding and planning there are multiple departmental and local responsibilities that interact.⁴⁴ Water UK argued that interdependencies between organisations, agencies and government bodies should be addressed by the Climate Change Risk Assessment.⁴⁵

17. The Climate Change Risk Assessment and the Adaptation Economic Analysis can generate much of the information the Government needs to give a higher priority to adaptation. They need to be supplemented with good quality evidence on the knock-on effects on the UK from the impacts of climate change overseas. **To maximise the value of the first and subsequent Climate Change Risk Assessments, the Government must:**

- **ensure that departments address the high-level priority risks identified in the risk assessments and integrate action within and across sectors;**
- **encourage and support other public sector bodies, the private sector and private individuals, to consider the threats and opportunities and act accordingly; and**

38 National Audit Office, *Adapting to climate change*, 2009, paras 2.14–2.15

39 Defra, UK Climate Change Risk Assessment and economic analysis – www.defra.gov.uk

40 Defra, UK Climate Change Risk Assessment and economic analysis – www.defra.gov.uk

41 National Audit Office, *Adapting to climate change*, 2009, p 13

42 Q 252, Q 269 and Government Office for Science, Welcome to Foresight Project on Global Environmental Migration – www.foresight.gov.uk

43 United Nations Framework Convention on Climate Change 1992, Article 4.8 – www.unfccc.int/2860.php

44 National Audit Office, *Adapting to climate change*, 2009, para 2.29

45 Ev 18

- **establish an efficient and effective adaptation programme that balances investing proactively now to address some risks, with building capacity to deal with consequences of climate change as they arise.**

The Government's adaptation objectives and assessing progress

18. The current climate change Public Service Agreement says that “As a complement to our mitigation efforts, the UK will develop a robust approach to domestic adaptation to climate change, shared across government, and encourage adaptation to climate change internationally.” Of the Public Service Agreement’s six indicators, the one that addresses adaptation focuses on sustainable abstraction of water in the UK.⁴⁶ Defra has said that both adaptation and mitigation “[...] are being addressed with the wider sustainable development agenda (i.e. social, economic, and environmental well-being) in mind”.⁴⁷ Adaptation can either maintain the status quo, or be part of a wider process of development to enhance the well-being of society.⁴⁸

19. Decision makers in government departments and the wider public sector cannot ignore the impacts of climate change. **The climate change Public Service Agreement for 2008–09 to 2010–11 refers to adaptation but focuses on mitigation. Given the scale, urgency and cross-departmental nature of the challenge, adaptation must feature more strongly in the Government’s next statement of its key priority outcomes.**

20. The absence of a commonly agreed target or metric for adaptation hinders decision making.⁴⁹ The National Audit Office (NAO) reported that measuring progress on adaptation is difficult as outcomes may not be seen and measurable for 30 to 50 years, and most of the current effort is around building adaptive capacity which is hard to define and measure.⁵⁰ The Government aims to develop a suite of indicators for adaptation, but work is at an early stage and there is little established evaluation practice to draw on.⁵¹ Work commissioned by the Government to identify the impacts and lessons from extreme weather events, such as the Pitt Review covering the 2007 floods, has provided some evidence.⁵²

21. The absence of clear objectives for adaptation, and metrics for measuring progress, makes it difficult for the Government to articulate what successful adaptation would look like. **The Government should draw on the Climate Change Risk Assessment and lessons learnt from extreme weather events to establish clear objectives and metrics for adaptation, and a baseline against which the UK’s progress in adapting can be measured. The Government’s objectives and metrics should make clear that adapting to**

46 HM Government, *PSA Delivery Agreement 27: Lead the global effort to avoid dangerous climate change*, 2007, paras 1.2, 2.1

47 Ev 126

48 Adger NW et al, *Are there social limits to adaptation to climate change?* *Climatic Change*, Vol. 93(3) (2009), pp 335–354

49 Ev 110

50 National Audit Office, *Adapting to climate change*, 2009, para 2.34

51 Ev 124

52 Sir Michael Pitt, *The Pitt Review: Learning lessons from the 2007 floods*, 2008

climate change protects people, property and prosperity, and safeguards the natural environment.

22. The Adaptation Sub-Committee 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 from all national authorities.⁵³ Lord Krebs, the Chairman of the Sub-Committee, told us that its top priority in the longer-term “[...] is to assess and advise on the state of preparedness of the UK to adapt to climate change.”⁵⁴

23. As an expert and independent body with a UK-wide remit, the Adaptation Sub-Committee has a key role to play in assisting the Government design and deliver an effective adaptation programme.⁵⁵ **In advising the Government, the Adaptation Sub-Committee of the Committee on Climate Change should assess whether the main risks identified in the Climate Change Risk Assessment are being addressed by departments, other public bodies and the private sector. We recommend that the Government ask the Sub-Committee’s advice on:**

- **priorities for future research on matters relating to adaptation;**
- **approaches for measuring and assessing progress on adaptation; and**
- **any lessons to be drawn from the different approaches to adaptation being taken in Northern Ireland, Scotland and Wales.**

24. **Central and all levels of sub-national government need to publicise better and more often the importance and benefits of acting on adaptation.** Doing so, will frame the context for those taking decisions on adaptation. It will also build understanding and support for the action the country needs to take, and the significant resources the country needs to invest, to manage climate impacts that will occur regardless of how successful we are at reducing emissions of greenhouse gases.

Limits to adaptation

25. There are economic, financial, technological and behavioural limits to adaptation.⁵⁶ The Grantham Institute for Climate Change at Imperial College noted that future greenhouse gas emissions could lead to climate change that may be beyond the capacity of natural and human systems to adapt to without major dislocations to society, the economy and the environment.⁵⁷ The Tyndall Centre warned that global warming of considerably more than 2°C would make adaptation much harder. They also pointed out that some adaptive actions are unsustainable (referred to as mal-adaptation) as they can increase greenhouse gas emissions or exacerbate impacts on another area, sector or social group.⁵⁸ One of the main costs arising from climate change may be the loss of land as sea levels rise.

53 National Audit Office, *Adapting to climate change*, 2009, para 2.4

54 Q 248 [Lord Krebs]

55 Ev 109

56 Q 274 [Professor Watson]

57 Ev 193

58 Ev 97

The Institution of Civil Engineers and a think tank of the Royal Institute of British Architects have said that the country needs to establish a long-term view of whether coastal and estuarine cities, such as Hull and Portsmouth, can be and should be defended and possibly helped to grow, or whether they, and some of their inhabitants, will need to retreat from rivers and the sea.⁵⁹

26. Adaptation has significant financial and non-financial costs, and there are limits to what the country can adapt to. **Adaptation requires the Government, and the country as a whole, to make hard choices about who and what to protect from the impacts of climate change. Given its limits and costs, adaptation is not an alternative to mitigation but a complementary partner. The Government must maintain its efforts to control emissions of greenhouse gases.**

Providing evidence and advice on adaptation

27. Decision makers are faced by uncertainty about how much the climate will change, and the impacts of that change on society, the environment, business and the economy.⁶⁰ One of the four themes of the Adapting to Climate Change Programme is to develop a more robust and comprehensive evidence base on the impacts and consequences of climate change.⁶¹ Defra told us that the Programme planned to spend a total of £7 million on research in 2009–10. The Adapting to Climate Change Programme's main investment to date has been £11 million spent over a number of years on the latest UK Climate Projections, released in summer 2009.⁶² For the first time, the projections explicitly account for the uncertainties in future climate change by providing probabilities for different climate outcomes. The projections do not provide direct information on the impacts and consequences of changing weather.⁶³

28. The Environment Agency, Water UK, the Royal Society for the Protection of Birds and the Local Government Association welcomed the new projections, and the Tyndall Centre told us they were looked on by other countries as best practice.⁶⁴ UKCIP, who have been promoting the projections, believed that they would in time aid sophisticated risk-based decision-making but currently they presented considerable complexity for many stakeholders.⁶⁵ UKCIP and others are developing ways to make the projections easier to use.⁶⁶ The Met Office faces a significant challenge in providing detailed climate projections at a local level.⁶⁷ The Grantham Institute thought that, because of the uncertainty in

59 Institution of Civil Engineers and Building Futures, *Facing up to sea level risk: Retreat? Defend? Attack? The Future of our Coastal and Estuarine Cities*, 2010

60 UKCIP, Defra and the Environment Agency, *Climate adaptation: Risk, uncertainty and decision-making—UKCIP Technical report*, 2003

61 Ev 117

62 Ev 125

63 National Audit Office, *Adapting to climate change*, 2009, para 2.11, and Ev 30

64 Ev 83, Ev 158, Ev 179 and Q 29, Q 227

65 Ev 30

66 Ev 35

67 Ev 196

regional projections, it was best to focus on building resilience and to keep adaptation plans as flexible as possible.⁶⁸

29. Defra and HM Treasury highlight the importance of taking a flexible approach to adaptation in the *Accounting for the Effects of Climate Change* supplement to the *Green Book: Project Appraisal and Evaluation in Central Government*. The supplement explains how the Environment Agency has built flexibility into its strategy to manage the flood risk to the Thames Estuary until 2100. The strategy identifies options to cope with different degrees of sea level rise, and the thresholds at which they will be required. Small incremental changes will be implemented first, leaving major irreversible decisions for the future when better information might be available.⁶⁹

30. The Government has made good progress in developing climate projections for the UK. The projections are a powerful tool in managing climate risks. But uncertainty in the projections, adds to uncertainty over how society and the economy will develop and respond to climate change. **The Government has been right to invest in improving the evidence base for adaptation, and should continue to do so to help organisations take informed decisions. Uncertainty over the impacts of climate change should not stop or delay action to address risks. A flexible approach to adaptation, which can be revised as knowledge about the nature and scale of climate change impacts develops, is essential.**

31. UKCIP has been the main source of publicly funded advice on adaptation. It has 20 staff and an annual budget of £1 million.⁷⁰ UKCIP was involved in establishing regional climate change partnerships: stakeholder groups that aim to raise awareness, build capacity and stimulate action in the regions.⁷¹ In 2009–10, Defra gave £405,000 to these Partnerships. It plans to provide the same funding in 2010–11, but beyond then funding is uncertain.⁷² The main source of advice for businesses and public sector organisations on reducing emissions of greenhouse gases is the Carbon Trust. During 2008–09, the Carbon Trust received grants totalling £81 million from Whitehall departments.⁷³

32. Local authorities have made critical comparisons between the level of support they can access on adaptation and the level of support they are given on reducing emissions of greenhouse gases through the Carbon Trust and the Energy Saving Trust.⁷⁴ UKCIP's Director, Dr Chris West, acknowledged that "[...] there is a knowledge gap that could be addressed by funding something like ourselves magnified many times and we could engage with every local authority. At the moment we engage with [...] those willing to learn about the process".⁷⁵ The Local Government Information Unit told us that local authorities

68 Ev 192

69 HM Treasury and Defra, *Accounting for the Effects of Climate Change, Supplementary Green Book Guidance*, 2009

70 Ev 27

71 Ev 28 and Ev 125

72 Ev 28 and Ev 125

73 Carbon Trust, *Driving action now and in the future: Annual report and accounts 2008–09*, 2009, p 70. Figure of £81 million excludes grant funding provided by the devolved administrations and grants provided so that the Carbon Trust could make interest-free loans.

74 Ev 29

75 Q 48

needed “A new national source of information and support for adaptation”.⁷⁶ This call has been echoed by a Planning and Climate Change Coalition of 30 organisations.⁷⁷ They proposed that support on adaptation should be part of a service which also covers climate change mitigation.⁷⁸

33. The Secretary of State for the Environment, Food and Rural Affairs told us that the Government needed to think about the best way of meeting the increased demand for guidance, practical examples and manuals. He identified architects and builders as two groups the Government needed to engage.⁷⁹

34. The resources of organisations advising on adaptation are limited, compared to organisations that advise on mitigation. Consequently, **progress on adaptation is hampered by a shortage of advice, particularly for local authorities. We recommend that, as a matter of urgency, the Government improve the provision and use of specialist adaptation advice and target that advice on the sectors and organisations that most need it.** The Government should reinforce action on both adaptation and mitigation by integrating the provision of advice on both aspects of climate change. Integration would help synergies rather than conflicts to develop. We therefore welcome the Department for Communities and Local Government announcement in March 2010 that it is providing £10 million to improve the skills and capacity of local authorities to deal with both aspects of climate change.⁸⁰

Funding adaptation and assisting those worst affected by climate change

35. Some adaptation actions, such as investing in new infrastructure, are costly.⁸¹ Some costs, like adapting offices, factories and homes and paying for insurance, fall to businesses and private individuals. The taxpayer will also have to meet higher costs. For example, the Environment Agency has predicted that, to maintain current levels of protection from river and sea flooding, real terms spending on flood defences in England will need to increase from its current level of around £600 million per annum to around £1 billion in 2035.⁸² If the country does not invest adequately in flood protection there will be an increased risk of flooding. The insurance industry may also review its existing commitment to provide flood cover as a standard feature of household and small business policies where the risk of flooding is no greater than once in 75 years.⁸³ The Environment Agency also reports that

76 Ev 38

77 The Planning and Climate Change Coalition includes third sector organisations and providers of planning services. A full list of its members is provided in the Coalition’s *Position Statement*, 2009, p 2 – www.tcpa.org.uk

78 Planning and Climate Change Coalition, *Position Statement*, 2009, pp 9–12 – www.tcpa.org.uk

79 Q 297

80 HC Deb, 9 March 2010, col 7WS

81 Ev 197

82 Ev 96 and Environment Agency, *Investing for the future. Flood and coastal risk management in England—a long term investment strategy*, 2009, p 4

83 Ev 187 and Defra, *Adapting to Climate Change: Analysing the Role of Government*, 2010, section 3.1.3

from around 2035 to the end of the century in the region of £7 billion may need to be invested in the Thames estuary's tidal defences.⁸⁴

36. The Greater London Authority (GLA) suggested that public sector organisations might be able to use related programmes, such as those to improve the attractiveness of the urban environment, to support activities that deliver both the programme's aims and action on adaptation.⁸⁵ They also said that the Government should help lever in private sector funding, for example to cover the upfront costs of ensuring homes are suited to future climates, but they noted that there was little creative thinking on the financing of adaptation.⁸⁶ The Government requires energy suppliers to assist customers on low incomes to improve the energy efficiency of their homes.⁸⁷ We reported in 2008 on how Kirklees Council had helped local people install renewable technology by making loans that homeowners repay if and when properties are sold.⁸⁸ Similar approaches could be taken to fund the cost of adapting homes.

37. Defra and the Environment Agency want to reduce the proportion of flood defence work funded by central government.⁸⁹ Options include contributions from: local authorities, who have a power to promote the economic, social or environmental well-being of their areas; businesses, who benefit from improved protection; developers, especially where improved protection enables new development to go ahead; and local people.⁹⁰ Contributions from local people are particularly important where a small number of homes need protection. In the last couple of years the Environment Agency has helped small groups of property owners to develop and jointly fund flood defence schemes.⁹¹

38. We address the overall role of the spatial planning system on adaptation in paragraphs 79 to 82 of this Report. In this section we focus on how the system can be used to increase the contributions that developers make. *The Pitt Review: Learning Lessons from the 2007 floods* recommended that developers should make a full contribution to the costs of building and maintaining any necessary flood defences.⁹² Under the Town and Country Planning Act 1990, planning authorities have been able to require developers to make contributions to new infrastructure related to a proposed development.⁹³ Research has shown that planning authorities make differing use of planning obligations to finance infrastructure, including environmental infrastructure.⁹⁴ The authorities best able to secure contributions had “[...] clear policies in place and better experience in the process”.⁹⁵ The

84 Environment Agency, *Thames Estuary 2100 plan*, 2009, Chapter 5

85 Q 152

86 Q 135 and Ev 70

87 Department of Energy and Climate Change, *Carbon Emissions Reduction Target (CERT)*, decc.gov.uk

88 Environmental Audit Committee, *Eight Report of Session 2007–08, Climate change and local, regional and devolved Government*, HC 225, para 52

89 Q 162

90 Q175 and Environment Agency, *Investing for the future. Flood and coastal risk management in England—a long term investment strategy*, 2009

91 Q 175

92 Sir Michael Pitt, *The Pitt Review: Learning lessons from the 2007 floods*, 2008, p 68

93 Department for Communities and Local Government, *Community Infrastructure Levy*, 2008, p 7

94 Ev 54

95 Ev 54

Department for Communities and Local Government reported in 2008 that local authorities tend to only negotiate planning obligations alongside consent for larger developments, partly because the time and costs involved do not always make it worthwhile negotiating obligations on smaller developments. Planning obligations were entered into on 14% of permissions for housing developments in 2005–06.⁹⁶ To reduce surface water flood risk, the Flood and Water Management Bill proposes that developers should no longer have an automatic right to connect to the sewerage system.⁹⁷ Instead, developers will need to provide sustainable urban drainage systems for most new developments.⁹⁸

39. The low level of planning obligations on new housing developments was one of the reasons for the Government introducing the Community Infrastructure Levy.⁹⁹ From April 2010, local authorities can, if they wish, charge the Levy on most types of new developments.¹⁰⁰ The Government has said the proceeds of the Levy will be “[...] spent on local and sub-regional infrastructure to support development” including transport, schools, parks, health centres and flood defences.¹⁰¹ The Town and Country Planning Association was concerned that the Levy will not be used to support adaptation measures.¹⁰²

40. Adapting to climate change is costly. The Government risks delaying action or encouraging an inadequate response unless additional, predictable and sustainable sources of funding and support are found. New sources of funding and support must be available by the time the National Adaptation Plan is put in place in 2012.

41. Government and other public bodies must engage local communities on adaptation. Localising decision making ensures schemes address local priorities, and thus increases the contributions local people and businesses are willing to make to adaptation. Local communities should be helped and encouraged to design and undertake their own adaptation schemes where public funds are not available.

42. The Government should increase the contributions that developers make to adapting the built environment. New developments benefit from established infrastructure, such as flood defences, and can reduce the wider resilience of the built environment. The Government should encourage all local authorities to use income from the new Community Infrastructure Levy to fund adaptation work. It should also encourage all local authorities to use planning obligations to require developers to take adaptation measures that benefit their new developments and the wider community.

96 Department for Communities and Local Government, *Community Infrastructure Levy: Detailed proposals and draft regulations for the introduction of the Community Infrastructure Levy: Consultation*, 2009, para 1.25

97 House of Commons Library, Research Paper, *Flood and Water Management Bill: Bill 9 of 2009–10*, 2009, pp 1–3

98 Sustainable Urban Drainage reduces the volume of water entering the drainage system during heavy rain and can therefore reduce flood risk. It includes measures such as permeable surfaces on car parks, soakaways and green roofs, para 6.1

99 Department for Communities and Local Government, *Community Infrastructure Levy*, 2008, p 6

100 Department for Communities and Local Government, *Community Infrastructure Levy* – www.communities.gov.uk

101 Department for Communities and Local Government, *Community Infrastructure Levy: Detailed proposals and draft regulations for the introduction of the Community Infrastructure Levy: Consultation*, 2009, paras 2.21 to 2.25

102 Ev 54

43. The Government should make use of public/private partnerships to fund large-scale programmes, such as the retrofitting of homes to improve their resilience to climate change and their energy and water efficiency. The Government and local authorities should develop other innovative options for helping homeowners meet the cost of retrofitting their properties.

44. Climate change will bring greater incidence of heat waves, increased flooding and, as we have recently reported,¹⁰³ is likely to reduce air quality.¹⁰⁴ These changes will harm peoples' homes, livelihoods and health. For the Tyndall Centre, deciding what the public liability is for the impacts of climate change is probably the most difficult question that the Government needs to tackle on adaptation.¹⁰⁵

45. The risk of coastal erosion will increase as climate change causes sea levels to rise, and coastal storms to be more severe and frequent.¹⁰⁶ In June 2009, the Government consulted on how coastal communities can successfully adapt to the impact of coastal change. The Government's proposals included local authorities providing financial assistance of up to £6,000 for demolition and removal costs for householders who experience complete loss of a home as a result of coastal erosion.¹⁰⁷ The Government is seeking to strike a balance between individuals taking responsibility for their investment decisions, and ensuring that practical assistance is made available to homeowners. It intends the scheme to be a "[...] temporary measure [...] whilst understanding of the risks associated with coastal erosion improves."¹⁰⁸ Defra estimates that over the next 20 years, 200 homes are likely to be made unsafe to live in due to coastal erosion and an additional 2,000 could become at risk during this period.¹⁰⁹ The Chairman of the Environment Agency told us that he would continue to press ministers to consider a sale and leaseback arrangement for people who were at risk of losing properties to coastal erosion.¹¹⁰ The Tyndall Centre warned that the Government needed to get the mechanisms for consultation and compensation right for coastal change, otherwise:

[...] public liability issues are going to cascade and be in other areas where 20 or 30 years from now we will know that the weather we are facing, the events, the excess mortality associated with heat waves, is down to human-induced climate change [...] There is an onus on central Government to directly deal with these risks where people were unaware of them.¹¹¹

46. The numbers of people suffering major loss from climate change will grow and there will be increasing calls for the public sector to provide financial compensation. It is right that the public sector should help people suffering major loss from a changing climate that

103 Environmental Audit Committee, Fifth Report of Session 2009–10, *Air Quality*, HC 229-I, para 7

104 Defra, *Adapting to climate change: UK Climate Projections*, 2009, p 15

105 Q 240

106 Defra, *Consultation on coastal change*, 2009, para 1.3

107 Defra, *Consultation on coastal change*, 2009, para 3.24

108 Defra, *Consultation on coastal change*, 2009, para 3.28

109 Defra, *Coastal erosion assistance package impact assessment*, 2009 – www.defra.gov.uk

110 Q 201

111 Q 219 and Q 240

the country as a whole has contributed to. But the Government should also limit a potentially huge liability for the taxpayer. The debate on financial compensation has focused on those who are losing their homes from coastal erosion. Rather than approaching each new group afresh, **we recommend the Government should establish broad principles to underpin decisions on assistance for communities badly affected by climate change, including what compensation should be paid to individuals who suffer major loss. Clear principles, informed by a public consultation, would help cap taxpayer liability and reduce the uncertainty faced by those suffering major loss about what help they will receive. Clarifying the limits on public liability will make clear who bears what risk and should encourage action by those who are at risk from future climate change impacts.**

3 The risks to government objectives and its capacity to respond

47. Adapting to climate change is a cross-government issue that requires action across a broad range of policy areas, including: business and the economy; infrastructure; agriculture, food security and the natural environment; homes, buildings and communities; flooding and coastal erosion.¹¹² The Adapting to Climate Change Programme works with government departments to help them embed adaptation into their work and policies, through the sharing of best practice, developing cross-departmental understanding and monitoring of progress.¹¹³

The impact of climate change on departments' objectives and programmes

48. Assessing the risks from climate change to departmental objectives and programmes is not straightforward as projected changes are uncertain, will occur over long timescales and could have a number of direct and indirect consequences.¹¹⁴ In response to a 2009 National Audit Office survey for this Committee, 10 departments reported they had undertaken a systematic assessment of the risks of climate change to some of their objectives, and the other six had undertaken a limited assessment for some or all of their objectives. Eleven of the 16 departments identified that climate change risks are potentially significant to some of their policy objectives, whereas Defra considered climate change risks to be a significant threat to all of its objectives.¹¹⁵ The Tyndall Centre told us that in addition to identifying risks to their own objectives, departments should consider the extent to which their objectives and programmes are contributing to greater vulnerability in their own or in other sectors.¹¹⁶ Water UK argued that policy makers, regulators and others needed to recognise the links between adaptation and mitigation and to promote 'win win' policies. For example, cutting water consumption will reduce the energy needed to abstract and provide water, and increase the volume of water that is available for the natural environment.¹¹⁷ A 2010 report by the Government Office for Science argued for the development of a coherent climate change adaptation and mitigation strategy for the use of land in the UK.¹¹⁸

49. Vulnerability to a changing climate is specific to location and specific to activity.¹¹⁹ UKCIP told us that high level departmental reviews typically yield generic risks and a "[...]

112 National Audit Office, *Adapting to climate change*, 2009, Figure 8

113 National Audit Office, *Adapting to climate change*, 2009, paras 2.5, 2.28

114 National Audit Office, *Adapting to climate change*, 2009, paras 2.28, 3.1

115 National Audit Office, *Adapting to climate change*, 2009, paras 3.2, 3.3 and Figures 6, 7

116 Ev 97

117 Ev 19

118 Government Office for Science, *Land use futures: making the most of land in the 21st century*, 2010, p 232

119 Ev 28

more detailed assessment further down the organisation will yield a richer understanding that will invite consideration of practical adaptation responses”.¹²⁰ Ofwat observed that:

In a general sense, the departments’ risks highlighted in the NAO review appear reasonable. However, the risks are set out in only the broadest of terms and this misses some of the more subtle predicted impacts of climate change. This is particularly true with regard to water.¹²¹

50. Natural England warned that assessing the costs and benefits of adaptation solely within individual departments exposes the Government to the risks created by perverse incentives and could result in unintended consequences.¹²² Defra expect the Departmental Adaptation Plans, due to be published shortly, to set out the “[...] practical steps each government department will take over the next two years to safeguard its policy objectives and programmes, and to improve leadership and delivery of adaptation by making relevant changes to operational systems and processes”.¹²³ The plans should also set out how departments will work collaboratively, including with stakeholders, to address key barriers to adaptation.¹²⁴ Defra has encouraged departments to combine their adaptation plans with the Carbon Reduction Delivery Plans (required by the Department of Energy and Climate Change) and prepare a single Climate Change Plan that addresses connections and interdependencies between mitigation and adaptation actions.¹²⁵

51. Departmental Adaptation Plans should be a key stepping stone for departments in taking responsibility for their own climate risks and delivering policy, programmes and projects that are adapted to future climates.¹²⁶ The Environment Agency argued that “[...] scrutiny of these plans is essential and will help establish what progress is being made”.¹²⁷ The Adaptation Sub-Committee will review a sample of the plans prepared in 2010.¹²⁸ The Sustainable Development Commission may wish to play a role in scrutinising the plans.¹²⁹

52. Departments need to improve their understanding of how climate change will affect their policy objectives and the ways they deliver those objectives. Departments also need to consider whether their actions are increasing climate change vulnerability. **We welcome the Government’s decision to require each department to prepare Departmental Adaptation Plans.** The plans could improve the delivery of, and accountability for, adaptation and, raise general awareness of climate change risks. The plans should encourage more cross-departmental working within government, and they should aid the linking of the adaptation and mitigation agendas. **But if departments are to understand climate change risks better, a bottom-up approach to risk assessment is needed.**

120 Ev 28

121 Ev 177

122 Ev 1

123 Ev 120

124 Ev 121

125 Ev 120

126 Ev 82

127 Ev 83

128 Ev 110

129 Ev 126

Departments should involve staff from all parts of their organisation and a wide range of stakeholders, including their delivery partners, in assessing risks and identifying potential responses. Departments need to decide which risks to accept, and which ones to prioritise for action. Departments also need to examine whether actions taken for very good reasons make adaptation to climate change harder: there are inevitably conflicts in policy and trade-offs have to be made. The Government must be clear about how the different considerations are weighed and how the trade-offs have been made.

53. Internal challenge, peer review, and external scrutiny, of future Departmental Adaptation Plans can play a key role in maintaining current momentum and reducing the risk that adaptation becomes marginalised. **Departments must set aside adequate resources to support the production and review of Departmental Adaptation Plans in future years. The Government should use the Plans to:**

- **get feedback on adaptation from stakeholders, civil society and the general public;**
- **focus more on outcomes and less on process; and**
- **encourage formal external scrutiny of progress.**

Our successors may wish to scrutinise the departments' plans.

Departments' capacity to manage risks arising from climate change

54. In 2009 the NAO found that departments were at very different stages of developing their capacity to manage risks. Some departments reported they were implementing climate change risk management strategies; others were at a much earlier stage in the process.¹³⁰ The Environment Agency's assessment was that preparation for climate change "[...] is more advanced in some parts of Whitehall than others".¹³¹ Embedding adaptation into mainstream business processes requires management commitment and time. The Environment Agency said it first built an allowance for the impact of climate change into its Flood Risk Appraisal Guidance in 1999, developed its first formal adaptation strategy in 2005, and continued to take action to embed adaptation into its business.¹³² Since 2007, the GLA has had a climate change duty that requires the Mayor and the London Assembly to mainstream climate change adaptation across their plans and strategies.¹³³ We were told by the Mayoral Adviser on the Environment that the climate change duty has helped convince all parts of the GLA that they must consider environmental issues.¹³⁴

55. Departments can help those delivering public services by establishing a clear and, where possible, quantified view of the risks to specific programmes. For flooding, Defra and the Environment Agency have quantified their risk appetite. Defra has "[...] used a rule that defending against a level of river flow 20% greater than 'normal' is necessary".¹³⁵

130 National Audit Office, *Adapting to climate change*, 2009, para 14

131 Q 213

132 Ev 93

133 Ev 69

134 Q 143

135 Ev 36

The Environment Agency's long-term investment strategy is based on the number of homes that are at risk of sea and river flooding from a 1 in 75 year event.¹³⁶ UKCIP contrasted these examples of good practice with the heat wave plan, pointing out that the plan lacks a political statement about the acceptable level of risk of deaths from heat waves. It is therefore difficult for decision makers at all levels of government to determine how much adaptation is required.¹³⁷

56. All departments need to consider climate change risks as part of the management of their objectives and programmes. Capacity to manage climate change risks varies across Whitehall. **We believe that the Government's current approach of assisting and encouraging departments to take action on adaptation, for example by introducing Departmental Adaptation Plans, is right. But the Government must look at other ways of changing behaviour if adaptation is not incorporated into mainstream business processes and instead becomes a box-ticking exercise. Options would include raising the authority and seniority of the Adapting to Climate Change Programme and its Board by moving them to the Cabinet Office.** The Cabinet Office already has the related responsibility for coordinating government-wide work to prepare for civil emergencies. **A duty could also be placed on departments requiring them to mainstream adaptation across their planning and management procedures.**

57. **For major programmes susceptible to climate change risks, departments should develop and communicate a clear, and where possible quantified, view of the particular level of risk they are willing to accept. This will help those managing public services to decide what type and level of adaptation action is necessary.** For some major programmes, departments may be able to wait for the results of the Climate Change Risk Assessment if it is going to provide information that will help them assess and quantify risks. However, there are programmes, such as those including new buildings, where departments need to communicate their acceptance of risk now. For lower priority programmes, or those less susceptible to climate change risks, departments may judge that there is no need for a central steer on risk, and those responsible for delivering public services are best placed to decide what risks to accept. **It is important that public bodies are clear about the boundaries of their decisions on adaptation. It is also important that elected members at all levels of government are engaged in decisions on adaptation.**

58. Opportunities will arise from climate change, for example low levels of warming may increase the productivity of certain crops and commercially grown trees.¹³⁸ In responding to the 2009 NAO survey, 11 departments did not identify any potential opportunities from climate change, and the remaining five identified a total of six potential opportunities. In total the 16 departments identified over 50 threats.¹³⁹ **Government departments have not given adequate attention to the opportunities that may arise from climate change. Departments need to take a balanced view of the impacts of climate change. The**

136 Environment Agency, *Investing for the future. Flood and coastal risk management in England—a long term investment strategy*, 2009, p 16

137 Ev 36

138 National Audit Office, *Adapting to climate change*, 2009, p 85

139 National Audit Office, *Adapting to climate change*, 2009, pp 50–96

Government must encourage departments to work with their partners to identify and exploit opportunities.

Appraising adaptation actions and the Green Book

59. Potential adaptation actions need to be appraised using rules set down in HM Treasury's *The Green Book: Policy Appraisal and Evaluation in Central Government*. The rules require departments to examine the lifetime costs and benefits of proposed projects, and consider whether there are better ways of achieving objectives or using resources.¹⁴⁰ In 2009, HM Treasury and Defra issued a supplement to the Green Book addressing adaptation to climate change.¹⁴¹ Natural England told us they were pleased with the supplementary guidance as it addresses the important principles of sustainable development and, by implication, sustainable adaptation. Their one criticism of the guidance was its failure to address the natural environment.¹⁴²

60. The Green Book requires departments to estimate the net present value of a proposed project. Departments convert costs and benefits that occur over the life of a project to “present values” by applying a discount rate. The standard Green Book discount rate requires departments to halve the value they place on benefits expected in 20 years from now, whilst benefits expected in 50 years from now are reduced by 80%. Discounting reflects that society as a whole prefers to receive goods and services now rather than later and prefers to defer costs to future generations.¹⁴³ Higher discount rates give greater weight to the interests of the current rather than future generations and make it more difficult for departments to justify investing in projects—including adaptation projects—that yield long-term benefits.

61. In response to the Stern Review on the Economics of Climate Change, HM Treasury issued, in 2008, new Green Book guidance on the discounting treatment of projects with very long-term effects (a minimum of 50 years) and which involve substantial and irreversible wealth transfers between generations.¹⁴⁴ Such projects might include major investment in infrastructure to improve its long-term resilience to climate change. The guidance introduced a new lower discount rate to be used alongside the standard Green Book rate in project appraisals. The new rate, which is closer to the rates used in the Stern Review, requires departments to reduce by 75% the value of benefits expected in 50 years from now.¹⁴⁵ There is no consensus amongst economists on discounting. Some argued that the Stern Review used too low a rate, and others have questioned the use of discounting to

140 HM Treasury, *The Green Book: Policy Appraisal and Evaluation in Central Government*, 2003

141 HM Treasury and Defra, *Accounting for the Effects of Climate Change, Supplementary Green Book Guidance*, 2009

142 Q 9, Q 11 [Dr Phillips]

143 HM Treasury, *The Green Book: Policy Appraisal and Evaluation in Central Government*, 2003, pp 26–27, 100

144 HM Treasury, *Intergenerational wealth transfers and social discounting: Supplementary Green Book guidance*, 2008, p 4

145 HM Treasury, *Intergenerational wealth transfers and social discounting: Supplementary Green Book guidance*, 2008, p 6

inform decisions which have major long-term and irreversible effects on the natural environment.¹⁴⁶

62. Defra is currently leading an interdepartmental review that aims to establish a clear analytical framework for considering sustainable development during policy development, appraisal and evaluation. The review is addressing concerns that cost-benefit analysis is too simplistic a tool for appraising actions which may have major impacts on the natural environment. Amongst other things, the review is considering how departments can improve the valuation of the natural environment in policy appraisal. It is also looking at discounting, as part of considering how the impacts of current decisions on future generations can be made more transparent to policy makers and the public.¹⁴⁷

63. Despite recent revisions to HM Treasury's Green Book, the rules and practice of policy appraisal can act as a barrier to public bodies getting approval for adaptation action that will deliver long-term benefits. If we do not invest in adaptation action now this will increase the cost of climate change to future generations. **Defra is currently looking at how sustainable development should be addressed as part of policy appraisal. We recommend that in taking this work forward, the Government looks at how departments can improve the way they value the impacts on the natural environment of potential adaptation action. The Government should also look again at the discount rates departments must apply when estimating the long-term benefits of adaptation actions.**

146 Martin Wolf, "In spite of economic sceptics, it is worth reducing climate risk", *Financial Times*, February 2007 and Martin L Weitzman, "On modelling and interpreting the economics of catastrophic climate change", *The Review of Economics and Statistics*, February 2009

147 Defra and the Government Economic Service, *Review of the Economics of Sustainable Development: Interim Report*, 2009 – www.defra.gov.uk

4 Adapting national infrastructure and the built environment

Adaptation of national infrastructure

64. National infrastructure are the facilities, systems, sites and networks necessary for the functioning of the country and the delivery of the essential services upon which daily life in the UK depends. The Government's Centre for the Protection of National Infrastructure has identified nine sectors that deliver essential services: energy, food, water, transport, communications, government, emergency services, health and finance.¹⁴⁸

The Reporting Power

65. The Climate Change Act 2008 introduced the Reporting Power through which the Government can require selected organisations to report on the progress they are making in adapting to climate change.¹⁴⁹ Of the 100,000 or so organisations covered by the new power, the Government has identified around 90 priority organisations who will prepare the first round of public reports due between July 2010 and November 2011. The priority organisations were selected because of their responsibility for national infrastructure, vulnerability to the projected impacts of climate change, and the absence of an existing regulatory framework to address adaptation.¹⁵⁰ They include the Environment Agency, water and energy companies, regulators and organisations responsible for different aspects of transport.¹⁵¹ The Government is also proposing to invite around 50 other organisations to report. These organisations "[...] either do not quite meet the criteria for inclusion but have highlighted their keenness to report, or meet the criteria and would be considered part of the priority list but do not sit within the legal definition of [a] reporting authority".¹⁵² Invited organisations that do not sit within the legal definition include: petroleum companies, electronic communications companies, and major food retailers, supply and distribution companies.¹⁵³ Each of the priority and invited organisations will be expected to report their assessment of the risks climate change poses to them, and the actions they are going to take in response.¹⁵⁴ The Government will determine the organisations to be included in the second round of reports, due in 2014 and 2015, after the first Climate Change Risk Assessment.¹⁵⁵

148 Centre for the Protection of National Infrastructure, Glossary – www.cpni.gov.uk

149 Defra, *Adapting to Climate Change: Ensuring Progress in Key Sectors: 2009 Strategy for exercising the Adaptation Reporting Power and list of priority reporting authorities*, 2009

150 National Audit Office, *Adapting to climate change*, 2009, para 2.37 and Defra, *An Update on the Adapting to Climate Change Programme*, March 2010 – www.defra.gov.uk

151 Defra, *List of priority reporting authorities*, 2009 – www.defra.gov.uk

152 Defra, *The Adaptation Reporting Power* – www.defra.gov.uk

153 Defra, *Adapting to Climate Change: Ensuring Progress in Key Sectors: 2009 Strategy for exercising the Adaptation Reporting Power and list of priority reporting authorities*, 2009, para 4.4

154 Defra, *Adapting to Climate Change: Ensuring Progress in Key Sectors: 2009 Strategy for exercising the Adaptation Reporting Power and list of priority reporting authorities*, 2009, para 1.17

155 Ev 123

66. The Environment Agency welcomed the Government's approach of asking a wide range of bodies to report as it believes this will encourage them to properly address climate change.¹⁵⁶ But the Adaptation Sub-Committee thought that the Reporting Power should be more widely applied and should cover electronic communications companies as they are vital for society's ability to monitor and respond to extreme events.¹⁵⁷ Consumer Focus suggested that the Reporting Power should be applied to the housing sector, given "[...] the importance of individuals' homes to wider society", and the financial services sector, as it provides essential products and information.¹⁵⁸ Consumer Focus also said that a voluntary invitation to organisations in the food sector "[...] does not reflect the necessity of food supplies and the level of risk they face from both gradual climatic changes and severe climate events".¹⁵⁹

67. The Reporting Power can be an important driver for behavioural and institutional change. It should provide valuable information on the preparedness of much of the country's critical infrastructure. While many organisations could be required to report, some important sectors of the economy, such as food and electronic communications, are not covered by the Climate Change Act 2008. The Government has asked organisations from these sectors to report voluntarily. **If organisations that have been asked to report on adaptation fail to provide good quality reports, the Government should bring forward amendments to the legislation requiring them to do so.**

Ensuring major infrastructure is adapted

68. The Government has considered the need to address climate change risks in major infrastructure. In 2009, a two-year cross-government project was established to examine and implement solutions to improve the long-term (i.e. 20–90 year timeframe) resilience of new and existing infrastructure in the water, transport and energy sectors. A review undertaken for the project found:

[...] that there is increasing awareness and understanding of the need to adapt to climate change within [the three] sectors. However, this has not generally led to adaptation action, with the focus remaining on mitigation of climate change impacts or short-term contingency planning [...] there is a reluctance to plan for the long-term impacts of climate change due to perceived uncertainty associated with the impacts of climate change and the financial risks.¹⁶⁰

69. Adaptation is also addressed in the new draft National Policy Statements covering nationally significant infrastructure, such as major energy generation facilities and major roads. Once finalised, these Statements will inform planning decisions to be taken by the new Infrastructure Planning Commission.¹⁶¹ The December 2009 Pre-Budget Report

156 Ev 83

157 Ev 109

158 Ev 147

159 Ev 148

160 URS Corporation Ltd, *Adapting Energy, Transport and Water Infrastructure to the Long-term Impacts of Climate Change: Summary report*, 2010 – www.defra.gov.uk

161 Ev 124 and Infrastructure Planning Commission, *National Policy Statements*, 2009 – www.infrastructure.independent.gov.uk

announced that Infrastructure UK would be established to advise government on priorities for long-term national infrastructure.¹⁶² Defra has said that Infrastructure UK will take account of the impacts of climate change in providing advice.¹⁶³

Adaptation in regulated industries

70. Adaptation in regulated industries such as water and energy needs to be supported by regulatory frameworks.¹⁶⁴ In responding to the Environment, Food and Rural Affairs Committee's 2009 report on the latest Ofwat price review for the water industry, the Government recognised that there:

[...] is a question about whether a system of economic regulation that was set up to extract maximum efficiencies post privatisation is appropriate in the more complex world of today, with social and environmental issues assuming a greater profile, and fundamental challenges about the fitness for purpose and quality of infrastructure, particularly in the face of climate change.¹⁶⁵

71. The Secretary of State for the Environment, Food and Rural Affairs told us that Ofwat will be required under the Reporting Power to “[...] report on what it intends to do to adapt its regulatory system.”¹⁶⁶ He also said that the time had come to ask whether the current regulatory framework for the water industry sufficiently takes account of climate change adaptation. Defra's Chief Scientific Adviser, Professor Robert Watson, told us that as part of adaptation the country needs to think about infrastructure in a more holistic way, and recognise the major interconnections between different sectors.¹⁶⁷

72. We agree with the Secretary of State that it is time to review whether the regulatory framework for water adequately supports adaptation. Like Ofwat, the principal duties of Ofgem focus on affordability and the cost of services to the consumer, with sustainable development addressed in its secondary duties.¹⁶⁸ **The Government should ensure that its economic regulatory frameworks are promoting adaptation actions that improve the resilience, and therefore long-term reliability, of services provided to consumers. Regulated companies should be required and enabled to take urgent, efficient and effective adaptation measures within, and across, the different sectors of national infrastructure.**

Local authorities

73. Local authorities have a key role in addressing climate change impacts, including: as transport and planning authorities; through housing and building control; as providers of

162 HM Treasury, *Pre-Budget Report 2009: Securing the recovery: growth and opportunity*, 2009, p 64

163 Defra, *Adapting to Climate Change: Analysing the Role of Government*, 2010, section 3.3.3

164 Ev 18

165 Environment, Food and Rural Affairs Committee, Fourth Special Report of Session 2008–09, *Ofwat Price Review 2009: Government Response to the Committee's Fifth Report of Session 2008–09*, HC 554, p 19

166 Q 284

167 Q 307 [Professor Watson]

168 Ofgem, About us – www.ofgem.gov.uk and Ofgem, the Department of Energy and Climate Change and HM Treasury, *Memorandum of Understanding*, 2010 – www.ofgem.gov.uk

green space, and through their work with other local delivery partners, such as the Environment Agency.¹⁶⁹ Local authorities were not included in the list of priority organisations for the Reporting Power because adaptation is included in the local authority performance framework.¹⁷⁰ The adaptation performance indicator (NI 188) aims to embed the management of climate change risks and opportunities across each local authority's (and their partners') services, plans and estates. NI 188 requires local authorities to assess and rate their progress in identifying and managing climate change risks.¹⁷¹ The Audit Commission examines local authorities' performance against all the 198 national indicators as part of Comprehensive Area Assessments.¹⁷²

74. NI 188 is unusual amongst national indicators as it is process—rather than outcome—driven. Guidance for local authorities, prepared in 2009 by the Local and Regional Adaptation Partnership Board—which supports local government and regional bodies on adapting to climate change—explains why a process indicator was selected.¹⁷³ Understanding of the adaptation agenda was not sufficient to specify outcomes and, as climate impacts are local, it is not possible to have a generic indicator applicable to all areas.¹⁷⁴ The Local Government Association told us that there will be a time when NI 188 will need to become more outcome-based.¹⁷⁵

75. The Environment Agency told us that the introduction of NI 188 will drive adaptation work at the local level.¹⁷⁶ The GLA felt there was a case for moving quickly to a more outcome-based metric. They said that the introduction of outcome-focused indicators on mitigation had increased the engagement of local authorities.¹⁷⁷

76. Fifty six of a possible 152 local authorities and their partners have prioritised the adaptation indicator by including it within their local area agreements that run from April 2008 to March 2011. Of these 56 authorities, 82% had met or exceeded the targets set for the first year, 2008–09.¹⁷⁸ Research undertaken by the Commission for Architecture and the Built Environment (CABE) shows that climate change adaptation is one of the least integrated policies across local authorities. CABE argued that the evidence base for the adaptation indicator should be strengthened, and all local authorities should be required to target improvements in performance against NI 188.¹⁷⁹

169 Environment Agency, UKCIP and the Local Government Association, *Be aware, be prepared, take action: how to integrate climate change adaptation strategies into local government*, 2008, p 4

170 Defra, *Adapting to Climate Change: Ensuring Progress in Key Sectors: 2009 Strategy for exercising the Adaptation Reporting Power and list of priority reporting authorities*, 2009, para 5.6

171 Local and Regional Adaptation Partnership Board, *Adapting to Climate Change: Guidance notes for NI 188*, 2009, p 4 – www.lga.gov.uk

172 Communities and Local Government Committee, Thirteenth Report of Session 2008–2009, *The Supporting People Programme*, HC 649-I, para 27

173 The Local and Regional Adaptation Partnership Board includes representatives from a number of organisations including Defra, the Department for Communities and Local Government and the Local Government Association.

174 Local and Regional Adaptation Partnership Board, *Adapting to climate change: Guidance notes for NI 188*, 2009, p 5 – www.lga.gov.uk

175 Ev 179

176 Ev 84

177 Q 141 [Ms Deding]

178 Ev 118

179 Ev 170

77. Less than 40% of authorities have selected the adaptation indicator as one of their priorities for the period April 2008 to March 2011. This reduces the effectiveness of the indicator in driving performance improvements. **The Government needs to monitor the performance of local authorities in adapting to climate change. It must apply the Reporting Power to local authorities if they are not making good progress.** The Government had good reason for including a process-based indicator for adaptation in the current set of national indicators. However, **as understanding of the adaptation agenda improves, the Government must develop indicators for adaptation that address local authority outcomes.**

The built environment

78. The extent to which the built environment is adapted to climate change depends on the actions of a range of decision makers, including: developers; building companies; insurance companies; property owners and occupants; and public sector bodies, including regional development agencies and local authorities.¹⁸⁰ During this examination we looked at whether good use was being made of the spatial planning system and green infrastructure in adapting the built environment. We also looked at the progress being made to adapt our existing housing stock.

The local planning system

79. For CABE, spatial planning was key to delivering strategic climate change and sustainability objectives.¹⁸¹ The Planning and Climate Change Coalition believed that the planning system's potential to help build community resilience, by getting the right development in the right place in a fair and transparent way, was not being realised because of a lack of resources, skills and political commitment.¹⁸² One of the organisations within the Coalition—the Town and Country Planning Association—told us that the “[...] number of planning applications [...] that go through the system with no consideration of climate change or adaptation at all [...] is frightening”.¹⁸³

80. The Government is revising its main planning guidance on climate change—the 2007 supplement to the Planning Policy Statement on Delivering Sustainable Development.¹⁸⁴ The Planning and Climate Change Coalition recognised that the current guidance sets out the case for action, but identified a gap between the policy ambition and real-world change.¹⁸⁵ They recommended that the revised guidance should state that:

Planning permission should be granted only where there is clear evidence that the proposal (in so far as it is capable of doing so) would [...] make a significant

180 Defra, *Adapting to Climate Change: Analysing the Role of Government*, 2010, para 3.2.2

181 The Commission for Architecture and the Built Environment, *Spatial Scales* – www.sustainablecities.org.uk

182 Planning and Climate Change Coalition, *Position Statement*, October 2009, p 5 – www.tcpa.org.uk

183 Q 120

184 Department for Communities and Local Government, *Consultation on a Planning Policy Statement: Planning for a Low Carbon Future in a Changing Climate*, March 2010 and Department for Communities and Local Government, *Planning Policy Statement, Planning and Climate Change, Supplement to Planning Policy Statement 1, 2007*

185 Planning and Climate Change Coalition, *Position Statement*, October 2009, p 5 – www.tcpa.org.uk

contribution to reducing greenhouse gas emissions; and make a significant contribution to reducing vulnerability and building resilience to climate change impacts.¹⁸⁶

81. The Planning and Climate Change Coalition argued that local authority members and officers should be trained on climate change by a new body with responsibility for advising and supporting local government on adaptation and mitigation (see paragraph 32).¹⁸⁷ The shortage of planning skills on climate change in part reflects a longer-term and wider problem of an overall shortage of staff and skills in planning departments. The Communities and Local Government Committee examined this issue in their July 2008 Report *Planning matters—labour shortages and skills gaps*.¹⁸⁸ In its November 2008 response, the Government accepted that “[...] addressing the identified shortages, in both numbers and skills, is a major challenge. The programmes which are either already underway or proposed are long-term measures and their impact will be seen over a period of years rather than instantly.”¹⁸⁹ The Department for Communities and Local Government intends that planning departments should benefit from the £10 million of funding it announced in March 2010 for improving the skills and capacity of local authorities to deal with climate change (see paragraph 34).

82. The planning system is central to tackling adaptation. The potential of the planning system to build community resilience to climate change impacts is not being realised due to weaknesses in planning guidance, some local authorities not treating adaptation as a priority, and gaps in skills. **In revising its guidance on planning and climate change, the Government must make adaptation and mitigation more central to the planning system. New developments should only be permitted if they are suited to future climates, and support the overall resilience of the built environment. Past experience clearly demonstrates that issuing planning guidance is not enough to ensure change. The Government needs to make sure that revised planning guidance, and action to improve the skills and capacity of planning departments, improves decision making.**

Green infrastructure

83. Green infrastructure comprises a suite of urban and rural land engineering measures such as sustainable urban drainage, water catchment and storage, porous paving, greater tree cover and more open green spaces.¹⁹⁰ Green infrastructure is sustainable and multifunctional. It can help urban environments to cope with some of the extreme effects of climate change, such as flash flooding and urban heat, as well as making urban environments more attractive, healthier and economically competitive.¹⁹¹ Green

186 Planning and Climate Change Coalition, *Position Statement*, October 2009, p 7 – www.tcpa.org.uk

187 Planning and Climate Change Coalition, *Position Statement*, October 2009, p 20 – www.tcpa.org.uk

188 Communities and Local Government Committee, Eleventh Report Session 2007–08, *Planning matters—labour shortages and skills gaps*, HC 517

189 Department for Communities and Local Government, *Government response to the Communities and Local Government Committee report: Planning matters—labour shortages and skills gaps*, 2008, Cm 7495, para 5

190 Ev 3

191 The Commission for Architecture and the Built Environment, *Green infrastructure* – www.sustainablecities.org.uk

infrastructure can also help reduce the environmental impact of urban growth by, for example, promoting biodiversity and the conservation of landscape.¹⁹²

84. The Royal Commission for Environmental Pollution argued in 2007 that the natural environment should be at the heart of urban design and management.¹⁹³ CABI told us that, whilst Departments have recognised that green infrastructure can help them deliver their policy objectives, they have overlooked its crucial role in climate change adaptation.¹⁹⁴ Natural England considered that “Green infrastructure, the environment and climate change should be part of single conversations between DCLG, Defra, DECC, and Homes and Communities Agency so the synergies are recognised and valued”.¹⁹⁵ They also told us that there should be a binding requirement for the provision of green infrastructure within new housing developments.¹⁹⁶ The Landscape Institute argued that the Government’s July 2009 planning guidance on Ecotowns fails to recognise that green infrastructure needs to be planned early in the development process if its adaptation potential is to be maximised.¹⁹⁷ Groundwork UK said there were inadequate funds to create and maintain green infrastructure.¹⁹⁸

85. In May 2009, the Government announced it would revise its planning guidance on open spaces, sport and recreation to provide a “[...] clearer message to local authorities about the vital and multifunctional roles of green infrastructure, and what is expected of them in its provision”.¹⁹⁹ At the time we agreed this Report the Government had just begun consulting on revised guidance.²⁰⁰

86. The Government is not utilising green infrastructure to tackle the impacts of climate change. **In updating its planning guidance on open spaces, sport and recreation, the Government must set out the strategic role green infrastructure should play in climate change adaptation. The Government should also promote green infrastructure as part of the National Adaptation Programme. Departments must deliver green infrastructure that supports adaptation and wider policy objectives by working more effectively across departmental boundaries. We recommend that the Government aligns the work of key departments on green infrastructure, and identifies a department to act as a green infrastructure champion.**

Adapting existing homes

87. There are 26 million homes in the UK, and around 85% of them are expected to still be in use in 2050.²⁰¹ These homes were at best designed to be resilient and suited to the

192 Royal Commission for Environmental Pollution, *The Urban Environment*, 2007, para 4.91

193 Royal Commission for Environmental Pollution, *The Urban Environment*, 2007, para 4.99

194 Ev 168

195 Ev 16

196 Ev 9

197 Ev 162

198 Ev 152

199 HM Government, *World Class Places: The Government’s strategy for improving the quality of place*, 2009, p 43

200 Department for Communities and Local Government, *Consultation paper on a new Planning Policy Statement: Planning for a Natural and Healthy Environment*, March 2010

201 Environmental Audit Committee, Second Report Session 2009–10, *Green Jobs and Skills*, HC 159-I, para 50

current climate, rather than future climates that will bring hotter temperatures and increased risk of flooding.²⁰² A 2008 report by three regional climate change partnerships identified cost effective measures to reduce the scale of climate change impacts on homes, but noted that take up is low because of a lack of awareness and limited availability of skilled installers.²⁰³ The GLA believed that people could be put off adapting their homes because of long pay back periods and concerns about hassle and inconvenience.²⁰⁴ They argued for the removal of VAT on adaptation measures and the establishment of integrated retro-fit programmes covering adaptation, energy efficiency and water efficiency.²⁰⁵ The GLA identified the main barriers to establishing an integrated programme as different funding streams and the fact that “[...] at all levels of government these issues are handled by different departments”.²⁰⁶

88. The country is currently making slow progress on the major task of adapting our current housing stock so that it is suitable for future climates. The Government and public sector bodies need to enable the adaptation of private and social housing. **We recommend that the Government remove any administrative barriers, and encourage local agencies, to establish one-stop shop services capable of providing the public with integrated retrofitting programmes covering adaptation, water efficiency and energy efficiency.** In our 2009 report on Green Jobs and Skills we recommended that the Government immediately and substantially increase the scale and speed of its programmes to improve the energy efficiency of existing buildings.²⁰⁷ An integrated retrofitting service would aid take-up, promote actions that support both adaptation and the efficient use of resources, and help reduce costs, by limiting the number of times that service providers need to enter people’s homes.

89. There are limited incentives for property owners to adapt their properties. Consumer Focus argued that “Better information on past flooding, and future flood risks, should be provided through a compulsory flood report in Home Information Packs.”²⁰⁸ Currently the vendor is required to answer questions on past flooding and whether they have checked data provided by the Environment Agency on flood risk.²⁰⁹ Consumer Focus also argued for cooling measures, such as air conditioning, to be included in Energy Performance Certificates.²¹⁰ The GLA pointed out that the inclusion of water in Energy Performance Certificates would reinforce the link between water and energy efficiency.²¹¹

202 The Three Regions Climate Change Group, *Your home in a changing climate: Retrofitting existing homes for climate change impacts*, 2008, p 8

203 The Three Regions Climate Change Group, *Your home in a changing climate: Retrofitting existing homes for climate change impacts*, 2008, p 9

204 Q 137

205 Q 140 and Ev 71

206 Q 139 and Q 141

207 Environmental Audit Committee, Second Report Session 2009–10, *Green Jobs and Skills*, HC 159-I, para 51

208 Ev 148

209 Department for Communities and Local Government, Property Information Questionnaire – www.communities.gov.uk

210 Ev 148

211 Ev 70

90. Insurance can enable losses from climate change to be spread across time and individuals. Insurance payments and premiums can be structured to provide incentives for individuals to change their behaviour and adapt properties.²¹² Defra has reported that following the floods in 2007, some insurance companies changed policies to encourage the uptake of measures that reduce flood risks.²¹³ Lord Smith of Finsbury, the Chairman of the Environment Agency, wished that insurance companies were readier to adjust premiums to reflect levels of flood resilience in properties and to encourage better resilience to be put in place.²¹⁴ The Environment Agency has had quite productive discussions with some insurance companies about how they can help people improve the resilience of properties once they have been flooded through simple measures such as waterproof plaster and raising electrics.²¹⁵ However, the GLA told us that when people make a claim after being flooded they get a like for like replacement and not measures that would improve the flood resilience of their properties.²¹⁶

91. The Government should strengthen the currently weak incentives for people to adapt their homes. Options include, broadening the coverage of Energy Performance Certificates, and requiring more information on the flood resilience of homes to be included within the overall Home Information Pack. **The Government should also press the insurance industry to encourage and assist homeowners to improve the flood resilience of their properties.**

212 Defra, *Adapting to Climate Change: Analysing the Role of Government*, 2010, section 3.1

213 Defra, *Adapting to Climate Change: Analysing the Role of Government*, 2010, section 3.1.3

214 Q 179

215 Q 176

216 Q138 [Mr Nickson]

5 Conclusion

92. Until 2008, the Government focused its climate change policy on mitigation. The Climate Change Act 2008 and the work of the cross-government Adapting to Climate Change Programme has raised the profile of adaptation in government. It is, however, too early to tell if the new policy framework will deliver the urgent programme of action that is required throughout the public sector and private sector. Unlike mitigation of climate change, the need for action on adaptation is not widely understood. The Government must raise awareness and improve the support that is available to organisations and the general public.

93. The Government has rightly linked adaptation to the wider sustainable development agenda. To help build awareness and support for adaptation, the Government must establish clear objectives and metrics. These should provide a view of what a well-adapting country would look like, and a framework for assessing the progress the country is making. The Government should make clear that adaptation is necessary to protect people, property and prosperity, and safeguard the natural environment.

94. The Government must demonstrate leadership on adaptation. Given the scale and breadth of the adaptation challenge all departments should identify and manage climate change risks more clearly. For their main policies and programmes, departments must establish a clear view of the climate change risks they face and decide what risks to accept and what risks to reduce through action. Some of the most difficult impacts the UK faces arise from the knock-on effects of climate change in other parts of the world, which could threaten food security and increase migration. The Government is right to help developing countries to address climate change impacts.

95. Adapting to climate change requires changes in behaviour and systems as well as investment in infrastructure. New sources of funding and resources are needed. Options include encouraging and enabling local communities to support adaptation schemes by localising decision making, and requiring developers to make greater contributions to the resilience of communities.

96. Adaptation is not an alternative to mitigation. There are limits to the level of climate change the country can adapt to without major damage to the environment, society and the economy. The Government must promote urgent action on adaptation, whilst maintaining its efforts to control emissions and thus improve our chances of avoiding the worst impacts of climate change.

Conclusions and recommendations

The Climate Change Act 2008 and the policy framework

1. The UK's adaptation policy framework compares well with arrangements put in place in other countries. The Climate Change Act 2008 has, however, introduced a complicated assessment and reporting regime. Its complexity has been increased by the introduction of Departmental Adaptation Plans. It remains to be seen if this regime will improve the current low levels of awareness and understanding of adaptation. The Government must act quickly to revise the regime if it does not lead to the urgent action that the public and private sectors need to take on adaptation. (Paragraph 13)
2. To maximise the value of the first and subsequent Climate Change Risk Assessments, the Government must:
 - ensure that departments address the high-level priority risks identified in the risk assessments and integrate action within and across sectors;
 - encourage and support other public sector bodies, the private sector and private individuals, to consider the threats and opportunities and act accordingly; and
 - establish an efficient and effective adaptation programme that balances investing proactively now to address some risks, with building capacity to deal with consequences of climate change as they arise. (Paragraph 17)

The Government's adaptation objectives and assessing progress

3. The climate change Public Service Agreement for 2008–09 to 2010–11 refers to adaptation but focuses on mitigation. Given the scale, urgency and cross-departmental nature of the challenge, adaptation must feature more strongly in the Government's next statement of its key priority outcomes. (Paragraph 19)
4. The Government should draw on the Climate Change Risk Assessment and lessons learnt from extreme weather events to establish clear objectives and metrics for adaptation, and a baseline against which the UK's progress in adapting can be measured. The Government's objectives and metrics should make clear that adapting to climate change protects people, property and prosperity, and safeguards the natural environment. (Paragraph 21)
5. In advising the Government, the Adaptation Sub-Committee of the Committee on Climate Change should assess whether the main risks identified in the Climate Change Risk Assessment are being addressed by departments, other public bodies and the private sector. We recommend that the Government ask the Sub-Committee's advice on:
 - priorities for future research on matters relating to adaptation;
 - approaches for measuring and assessing progress on adaptation; and

- any lessons to be drawn from the different approaches to adaptation being taken in Northern Ireland, Scotland and Wales. (Paragraph 23)
6. Central and all levels of sub-national government need to publicise better and more often the importance and benefits of acting on adaptation. (Paragraph 24)

Limits to adaptation

7. Adaptation requires the Government, and the country as a whole, to make hard choices about who and what to protect from the impacts of climate change. Given its limits and costs, adaptation is not an alternative to mitigation but a complementary partner. The Government must maintain its efforts to control emissions of greenhouse gases. (Paragraph 26)

Providing evidence and advice on adaptation

8. The Government has been right to invest in improving the evidence base for adaptation, and should continue to do so to help organisations take informed decisions. Uncertainty over the impacts of climate change should not stop or delay action to address risks. A flexible approach to adaptation, which can be revised as knowledge about the nature and scale of climate change impacts develops, is essential. (Paragraph 30)
9. Progress on adaptation is hampered by a shortage of advice, particularly for local authorities. We recommend that, as a matter of urgency, the Government improve the provision and use of specialist adaptation advice and target that advice on the sectors and organisations that most need it. (Paragraph 34)

Funding adaptation and assisting those worst affected by climate change

10. Adapting to climate change is costly. The Government risks delaying action or encouraging an inadequate response unless additional, predictable and sustainable sources of funding and support are found. New sources of funding and support must be available by the time the National Adaptation Plan is put in place in 2012. (Paragraph 40)
11. Government and other public bodies must engage local communities on adaptation. Localising decision making ensures schemes address local priorities, and thus increases the contributions local people and businesses are willing to make to adaptation. Local communities should be helped and encouraged to design and undertake their own adaptation schemes where public funds are not available. (Paragraph 41)
12. The Government should increase the contributions that developers make to adapting the built environment. New developments benefit from established infrastructure, such as flood defences, and can reduce the wider resilience of the built environment. The Government should encourage all local authorities to use income from the new Community Infrastructure Levy to fund adaptation work. It should also encourage all local authorities to use planning obligations to require developers to take

adaptation measures that benefit their new developments and the wider community. (Paragraph 42)

13. The Government should make use of public/private partnerships to fund large-scale programmes, such as the retrofitting of homes to improve their resilience to climate change and their energy and water efficiency. The Government and local authorities should develop other innovative options for helping homeowners meet the cost of retrofitting their properties. (Paragraph 43)
14. We recommend the Government should establish broad principles to underpin decisions on assistance for communities badly affected by climate change, including what compensation should be paid to individuals who suffer major loss. Clear principles, informed by a public consultation, would help cap taxpayer liability and reduce the uncertainty faced by those suffering major loss about what help they will receive. Clarifying the limits on public liability will make clear who bears what risk and should encourage action by those who are at risk from future climate change impacts. (Paragraph 46)

The impact of climate change on departments' objectives and programmes

15. We welcome the Government's decision to require each department to prepare Departmental Adaptation Plans. (Paragraph 52)
16. If departments are to understand climate change risks better, a bottom-up approach to risk assessment is needed. Departments should involve staff from all parts of their organisation and a wide range of stakeholders, including their delivery partners, in assessing risks and identifying potential responses. Departments need to decide which risks to accept, and which ones to prioritise for action. Departments also need to examine whether actions taken for very good reasons make adaptation to climate change harder: there are inevitably conflicts in policy and trade-offs have to be made. The Government must be clear about how the different considerations are weighed and how the trade-offs have been made. (Paragraph 52)
17. Departments must set aside adequate resources to support the production and review of Departmental Adaptation Plans in future years. The Government should use the Plans to:
 - get feedback on adaptation from stakeholders, civil society and the general public;
 - focus more on outcomes and less on process; and
 - encourage formal external scrutiny of progress. (Paragraph 53)

Departments' capacity to manage risks arising from climate change

18. We believe that the Government's current approach of assisting and encouraging departments to take action on adaptation, for example by introducing Departmental Adaptation Plans, is right. But the Government must look at other ways of changing behaviour if adaptation is not incorporated into mainstream business processes and

instead becomes a box-ticking exercise. Options would include raising the authority and seniority of the Adapting to Climate Change Programme and its Board by moving them to the Cabinet Office. (Paragraph 56)

19. A duty could also be placed on departments requiring them to mainstream adaptation across their planning and management procedures. (Paragraph 56)
20. For major programmes susceptible to climate change risks, departments should develop and communicate a clear, and where possible quantified, view of the particular level of risk they are willing to accept. This will help those managing public services to decide what type and level of adaptation action is necessary. (Paragraph 57)
21. It is important that public bodies are clear about the boundaries of their decisions on adaptation. It is also important that elected members at all levels of government are engaged in decisions on adaptation. (Paragraph 57)
22. Government departments have not given adequate attention to the opportunities that may arise from climate change. Departments need to take a balanced view of the impacts of climate change. The Government must encourage departments to work with their partners to identify and exploit opportunities. (Paragraph 58)

Appraising adaptation actions and the Green Book

23. Defra is currently looking at how sustainable development should be addressed as part of policy appraisal. We recommend that in taking this work forward, the Government looks at how departments can improve the way they value the impacts on the natural environment of potential adaptation action. The Government should also look again at the discount rates departments must apply when estimating the long-term benefits of adaptation actions. (Paragraph 63)

Adaptation of national infrastructure

24. If organisations that have been asked to report on adaptation fail to provide good quality reports, the Government should bring forward amendments to the legislation requiring them to do so. (Paragraph 67)
25. The Government should ensure that its economic regulatory frameworks are promoting adaptation actions that improve the resilience, and therefore long-term reliability, of services provided to consumers. Regulated companies should be required and enabled to take urgent, efficient and effective adaptation measures within, and across, the different sectors of national infrastructure. (Paragraph 72)
26. The Government needs to monitor the performance of local authorities in adapting to climate change. It must apply the Reporting Power to local authorities if they are not making good progress. (Paragraph 77)
27. As understanding of the adaptation agenda improves, the Government must develop indicators for adaptation that address local authority outcomes. (Paragraph 77)

The built environment

28. In revising its guidance on planning and climate change, the Government must make adaptation and mitigation more central to the planning system. New developments should only be permitted if they are suited to future climates, and support the overall resilience of the built environment. Past experience clearly demonstrates that issuing planning guidance is not enough to ensure change. The Government needs to make sure that revised planning guidance, and action to improve the skills and capacity of planning departments, improves decision making. (Paragraph 82)
29. In updating its planning guidance on open spaces, sport and recreation, the Government must set out the strategic role green infrastructure should play in climate change adaptation. The Government should also promote green infrastructure as part of the National Adaptation Programme. Departments must deliver green infrastructure that supports adaptation and wider policy objectives by working more effectively across departmental boundaries. We recommend that the Government aligns the work of key departments on green infrastructure, and identifies a department to act as a green infrastructure champion. (Paragraph 86)
30. We recommend that the Government remove any administrative barriers, and encourage local agencies, to establish one-stop shop services capable of providing the public with integrated retrofitting programmes covering adaptation, water efficiency and energy efficiency. (Paragraph 88)
31. The Government should strengthen the currently weak incentives for people to adapt their homes. (Paragraph 91)
32. The Government should also press the insurance industry to encourage and assist homeowners to improve the flood resilience of their properties. (Paragraph 91)

Formal Minutes

Tuesday 16 March 2010

Members present:

Mr Tim Yeo, in the Chair

Colin Challen
Mr David Chaytor
Jo Swinson

Dr Desmond Turner
Joan Walley

Draft Report (*Adapting to Climate Change*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 96 read and agreed to.

Summary agreed to.

Resolved, That the Report be the Sixth Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

Written evidence was ordered to be reported to the House for printing with the Report, together with written evidence reported and ordered to be published on 24 November, 1 December, 26 January and 2 February.

[Adjourned to a day and time to be fixed by the Chairman.]

Witnesses

Tuesday 1 December 2009

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Dr Helen Phillips, Chief Executive and **Dr Tom Tew**, Chief Scientist, Natural England Ev 9

Mr Andrew Brown, Climate Change and Environmental Performance Manager, Anglian Water; **Ms Pamela Taylor OBE**, Chief Executive, and **Dr Bruce Horton**, Environmental Policy Adviser, Water UK Ev 20

Dr Chris West, Director, UK Climate Impacts Programme Ev 30

Tuesday 8 December 2009

Dr Andrew Johnston, Head of the Centre for Local Sustainability, Local Government Information Unit Ev 42

Mr Gideon Amos OBE, Chief Executive, and **Dr Hugh Ellis**, Chief Planner, Town and Country Planning Association Ev 62

Tuesday 5 January 2010

Ms Isabel Deding, Mayoral Adviser on the Environment, and **Mr Alex Nickson**, Climate Change Manager (Adaptation), Greater London Authority Ev 71

Tuesday 19 January 2010

Lord Smith of Finsbury, a Member of the House of Lords, Chairman and **Dr Paul Leinster CBE**, Chief Executive, Environment Agency Ev 85

Professor Neil Adger and **Dr Tim Rayner**, Tyndall Centre for Climate Change Research, University of East Anglia Ev 100

Tuesday 26 January 2010

Professor Lord John Krebs, a Member of the House of Lords, Chairman of the Adaptation Sub-Committee of the Committee on Climate Change and **Mr Neil Golborne**, Team Leader Adaptation, Committee on Climate Change Ev 111

Rt Hon Hilary Benn MP, Secretary of State for Environment, Food and Rural Affairs, **Professor Robert Watson**, Chief Scientific Adviser and **Mr Robin Mortimer**, Director, Adapting to Climate Change Programme, Department for Environment, Food and Rural Affairs Ev 130

List of written evidence

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3	British Geological Survey (BGS)	Ev 183
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5	Chartered Institution of Water and Environmental Management (CIWEM)	Ev 156
6	Commission for Architecture and the Built Environment (CABE)	Ev 167
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8	Department for Environment, Food and Rural Affairs (Defra)	Ev 116
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10	EDF Energy	Ev 163
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15	Historic Houses Association (HHA)	Ev 144
16	The Institute of Environmental Management and Assessment (IEMA)	Ev 189
17	Landscape Institute	Ev 159
18	Local Government Association (LGA)	Ev 178
19	Local Government Information Unit (LGIU)	Ev 38: Ev 48
20	Met Office	Ev 196
21	National Farmers' Union (NFU)	Ev 184
22	Natural England	Ev 1: Ev 15
23	Office of the Mayor of London	Ev 69
24	Ofwat	Ev 175: Ev 204
25	Royal Society for the Protection of Birds (RSPB)	Ev 157
26	South West Climate Change Impacts Partnership (SWCCIP)	Ev 198
27	Town and Country Planning Association	Ev 50
28	Tyndall Centre for Climate Change Research	Ev 96
29	UK Climate Impacts Programme (UKCIP)	Ev 26: Ev 34
30	Water UK	Ev 16: Ev 24
31	Waterwise	Ev 153
32	Wildlife Trusts	Ev 165
33	Woodland Trust	Ev 171

List of Reports from the Committee during the current Parliament

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2009–10

First Report	The work of the Committee in 2008–09	HC 58
Second Report	Green Jobs and Skills	HC 159-I and -II (HC 435)
Third Report	Carbon budgets	HC 228-I and -II
Fourth Report	The role of carbon markets in preventing dangerous climate change	HC 290
Fifth Report	Air Quality	HC 229-I and -II

Session 2008–09

First Report	Work of the Committee in 2007–08	HC 108
Second Report	Environmental Labelling	HC 243 (HC 861)
Third Report	Pre-Budget Report 2008: Green fiscal policy in a recession	HC 202 (HC 563)
Fourth Report	Reducing CO ₂ and other emissions from shipping	HC 528 (HC 1015)
Fifth Report	Reducing greenhouse gas emissions from deforestation: No hope without forests	HC 30 (HC 1063)
Sixth Report	Greening Government	HC 503 (HC 1014)

Session 2007–08

First Report	Are biofuels sustainable?	HC 76-I & -II (HC 528)
Second Report	Reducing Carbon Emissions from UK Business: The Role of the Climate Change Levy and Agreements	HC 354 (HC 590)
Third Report	The 2007 Pre-Budget Report and Comprehensive Spending Review: An environmental analysis	HC 149-I & -II (HC 591)
Fourth Report	Are Biofuels Sustainable? The Government Response	HC 528 (HC 644)
Fifth Report	Personal Carbon Trading	HC 565 (HC 1125)
Sixth Report	Reaching an international agreement on climate change	HC 355 (HC 1055)
Seventh Report	Making Government operations more sustainable: A progress report	HC 529 (HC 1126)
Eighth Report	Climate change and local, regional and devolved government	HC 225 (HC 1189)
Ninth Report	Carbon capture and storage	HC 654 (Cm 7605)
Tenth Report	Vehicle Excise Duty as an environmental tax	HC 907 (HC 72)

Eleventh Report	The Exports Credit Guarantee Department and Sustainable Development	HC 929 (HC 283)
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Thirteenth Report	Halting biodiversity loss	HC 743 (HC 239)

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Third Report	Regulatory Impact Assessments and Policy Appraisal	HC 353 (HC 849)
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Fifth Report	Trade, Development and Environment: The Role of FCO	HC 289 (HC 1046)
Sixth Report	The Voluntary Carbon Offset Market	HC 331 (HC 418)
Seventh Report	Beyond Stern: From the Climate Change Programme Review to the Draft Climate Change Bill	HC 460 (HC 1110)
Eighth Report	Emissions Trading: Government Response to the Committee's Second Report of Session 2006–07 on the EU ETS	HC 1072
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Third Report	Sustainable Procurement: the Way Forward	HC 740
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Fifth Report	Sustainable Housing: A follow-up report	HC 779
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Seventh Report	Sustainable Development Reporting by Government Departments	HC 1322 (HC 1681)
Eighth Report	Proposals for a draft Marine Bill	HC 1323 (HC 1682)
Ninth Report	Reducing Carbon Emissions from Transport	HC 981
Tenth Report	Trade, Development and Environment: The Role of DFID	HC 1014 (HC 197)

Eleventh Report	Outflanked: The World Trade Organisation, International Trade and Sustainable Development	HC 1455 (HC 354)
Twelfth Report	Transport Emissions: Government Response to the Committee's Ninth Report of Session 2005–06 on Reducing Carbon Emissions from Transport	HC 1718

Oral evidence

Taken before the Environmental Audit Committee on Tuesday 1 December 2009

Members present

Mr Tim Yeo, in the Chair

Colin Challen
Mr Martin Caton

Dr Desmond Turner
Joan Walley

Memorandum submitted by Natural England

EXECUTIVE SUMMARY

- Natural England believes that climate change is the most serious long term threat to the natural environment and human well-being. Our natural environment is our greatest asset, the basis on which we must build a future in a rapidly changing climate.
- To secure a comfortable lifestyle in a world which is likely to warm by between two and four degrees, we must act to protect the long term health of the environment and the ecosystem services which it provides.
- Consequently, enabling the natural environment to adapt to climate change is not an optional extra alongside the pressing need to safeguard homes, infrastructure, livelihoods and human life. It must be at the core of adaptation and future growth.
- Working *with* natural processes affords protection to homes, infrastructure, livelihoods, and human life without substantial long term maintenance costs, set to rise year on year, and without damaging the essentials for life provided by a healthy natural environment.
- This is a responsibility of all Government departments, not just Defra.
- Natural England has taken a lead in sustainable adaptation, embedding it throughout its operations, establishing demonstration projects to examine appropriate land management responses to a changed climate.
- Assessing the costs and benefits of adaptation solely within individual departments exposes the Government to the risks created by perverse incentives, resulting in unintended consequences. Far more needs to be done towards ensuring the right incentives are put into place. Additionally, there is a great deal to be done to ensure that the costs of adaptation and savings from sustainable adaptation are properly understood and accounted for across the whole of Government, rather than within departments alone, to prevent inappropriate short term or otherwise ill-informed decisions on investment.
- In the future, assessments of value for money, and reporting of these, must be based on sustainable adaptation and a healthy, resilient natural environment, if only to safeguard present and future taxpayers.
- There are practical mechanisms for sustainable adaptation, drawing on expertise and departmental responsibilities from across Whitehall. One of the most effective of these is green infrastructure, and we have drawn the committee's attention to this as a specific example of the cross-Whitehall (and cross sectoral) issues which we must address.
- Sustainable adaptation, predicated on a healthy and resilient natural environment is a responsibility which is shared across Government departments.

1. INTRODUCTION

Natural England is a statutory body created in 2006, charged with the responsibility to ensure that England's unique natural environment is protected and improved.

Natural England's 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.

In our capacity as a statutory adviser to Government, we offer advice on the making of national public policy through our analysis, evidence, and lessons drawn from delivery experience. As an NDPB, we then implement national public policy throughout its own activities via the development of organisational policy (specific to the activities of Natural England), guidance for local delivery, and forward programmes of evidence gathering.

2. ADAPTATION—A NATIONAL IMPERATIVE

2.1 Current efforts to address the causes of climate change are to be welcomed. Natural England supports the actions set in train through the Climate Change Act, and we support the Government's commitment to the creation of a low carbon economy.

2.2 Measures taken must continue to work towards reducing the severity of future changes to our climate. Because it also supplies economically vital ecosystem services, we cannot afford not to conserve the natural environment, and the policy framework needs to be built upon this inescapable truth.

2.3 Despite collective efforts in recent years, substantial change is already “locked” into our climate, resulting from emissions made over many decades. Government and civil society must plan and act to adapt to unavoidable climate change in the short and medium term.

2.4 To fail to adapt, adapt poorly, or simply adapt too late, will be more expensive, and less effective. It is also far more likely to result in unintended consequences than a planned programme for sustainable adaptation enacted now.

2.5 We still have an opportunity to adapt sustainably, efficiently, effectively and towards well planned outcomes. Adaptation remains largely a matter of political choice, not a question of technical capability.

2.6 Enabling the natural environment to adapt to climate change is not an optional extra alongside the pressing need to safeguard homes, infrastructure, livelihoods and human life. It is at the core of sustainable adaptation and future growth.

2.7 Working with—not against—natural processes, affords protection to homes, infrastructure, livelihoods and human life without substantial long term maintenance costs, rising year on year, and without damaging the essentials for life provided by a healthy environment. Future monitoring and reporting arrangements on progress towards successful adaptation must include measures which enable Government and others to scrutinise the degree to which adaptation is leading to a healthier and more resilient natural environment. At present, these are not evident.

2.8 Ecosystem services—unnoticed until they fail—include soil fertility; fresh water catchment and storage; flood prevention and management; and summer cooling in cities. The continued provision of ecosystem services depends on a healthy and resilient natural environment, for which sustainable adaptation is necessary.

2.9 Where ecosystem services can be brought back into production, the costs are likely to be exorbitant—far in excess of the costs associated with damage prevention, particularly in the face of a rapidly changing climate. Where damaged beyond repair, costs of replacement with man-made engineering alternatives are likely to be beyond the reach for many economies, including some in the developed west.

2.10 Current research indicates that the climate may become four degrees warmer, not two which is the target towards which our mitigation efforts are aimed.

2.11 It is responsible to aim at cutting emissions so that the climate does not warm by more than two degrees. It is equally responsible to plan for sustainable adaptation in a world four degrees warmer. Sustainable adaptation offers a solution addressing all the challenges faced in a changing climate, at a potentially much lower cost than some traditional measures.

2.12 Achieving sustainable adaptation will require exactly the sort of cross-Government response of interest to the Committee, enabled by appropriate policies, funding, monitoring and reporting arrangements.

2.13 In Annex 1(a), there are five examples which illustrate the importance of natural systems and sustainable adaptation in tackling some of the risks facing society and the economy.

3. EXAMPLES OF NATURAL ENGLAND'S WORK ON ADAPTATION

3.1 Since our inception in October 2006 we have placed sustainable adaptation at the heart of our own operational policy, decision making and advice.

3.2 Adapting to climate change is necessary to protect ecosystem services, and the best way to secure adaptation is working at landscape scale. In March 2009 we published landscape scale climate change adaptation strategies for the Norfolk Broads,¹ Cumbria High Fells, Shropshire Hills and Dorset Downs.

3.3 The reports illustrate how climate change may affect some of England's most iconic landscapes, and their wildlife and habitats, and suggest the practical measures needed in each place to improve the resilience of the natural environment to climate change whilst retaining its intrinsic value, and ability to provide economic and social benefits. While the different areas require a range of specific adaptation responses, there are some broad actions common to all areas. For example:

- improving the condition of existing habitats;
- restoring lost and degraded habitats;

¹ Formed by peat excavation over many centuries past, which at the time released of green house gases and reduced that region's carbon sink capacity—but long before either became an issue.

- extending existing habitats into new areas; and
- adopting sensitive farming methods—for example, leaving vegetated buffer strips around fields and not leaving fields bare.

3.4 The results from these studies will inform Natural England’s approach to adaptation at a landscape scale across England, and will inform the advice we will provide to our partners, in particular, the risk assessments and adaptation response strategies that are required by the Climate Change Act. We are working with partners to implement these strategies, and during 2009–10 the project is being extended across England into five more study areas: London, South East Northumberland Coastal Plain, Humberhead Levels, Sherwood, and a regional scale study in the South East of England.

3.5 Natural England plays a pivotal role in the delivery of adaptation on the ground. We administer approximately £0.5 billion per annum of agri-environment monies and have integrated climate change considerations into Environmental Stewardship schemes so that adaptation is increasingly well delivered by private land managers and landowners.

3.6 We have opted to report voluntarily under the new reporting power under the Climate Change Act and are undertaking a risk assessment with regard to our business and climate change, sharing lessons learned and data gathered with other reporting bodies, Defra and stakeholders.

4. THE NATIONAL POLICY FRAMEWORK

4.1 An effective, efficient and up-to-date national framework for policy and delivery is needed if we are to successfully contribute to timely and sustainable adaptation. Experience to date suggests that there are a number of areas where the existing policy framework warrants review and improvement.

4.2 The themes used by the National Audit Office (NAO) usefully set the scene for a cross-cutting approach to the assessment of adaptation policy across Government. The themes are business and the economy; infrastructure; agriculture, food security and the natural environment; homes and buildings (including government estate); and public health.

4.3 The NAO report earlier this year suggests that the natural environment, which underpins the security and sustainability of the other themes, is too easily regarded as the primary responsibility of Defra and not the responsibility of other government departments. But, it is other government departments which are responsible for the development of policy levers which directly deliver and enable adaptation. For example:

- (a) DCLG is responsible for measures on planning and development control (including green infrastructure), spatial planning, local government and its regulation, communities, and housing. DCLG are already working closely with Defra.
- (b) Her Majesty’s Treasury is responsible for the financial arrangements which fund and shape national delivery, sending important signals to other sectors including local government and the private sector about what does and does not constitute effective and efficient use of public money. Unless these signals support and enable sustainable adaptation, long term value for money, and cross-government value for money, there is a danger that the adaptation policy messages from Defra will not be translated into action.²

4.4 The departmental approach to considering climate change risks and adaptation needs is the first, and welcome, step in the Government’s overall task.

4.5 Persisting with a consideration of the costs and benefits of adaptation on a departmental basis, however, runs very significant risks to both the goals of sustainable adaptation and good value for money across Government.

4.6 A potential solution is for the assessment of costs and benefits to be undertaken on a whole-Government basis in the future. This would also serve to improve inter-departmental communication as well as practical collaboration toward the Government-wide goal of adaptation, while reducing the risk of unintended consequences across the Government’s programme.

4.7 There are some adaptation options which, because they are based on sustainable adaptation, address risks apparent in several of the NAO’s themes and draw upon the expertise from across Government departments. Green Infrastructure³ is one such measure towards sustainable adaptation.

4.8 DCLG, for example, are making progress toward safeguarding homes, communities, infrastructure, business and economic interests, and the natural environment through the increased importance attached to “green infrastructure”.

4.9 A changing climate means that the majority of our plants and animals will have to move inland, uphill and north to find new, viable homes. They need green spaces and healthy waterways to move through and to move to—ie connectivity—if they are to succeed. Green infrastructure provides this.

² The costs of non-adaptation, mal-adaptation and delayed adaptation were detailed at a global scale in the report from Sir Nicholas Stern.

³ Green infrastructure refers to a suite of urban and rural land engineering measures such as porous paving and sustainable urban drainage; sub-surface flood attenuation; public and private buildings orientated to benefit from summer shade and winter wind breaks; water catchment and storage; carbon capture and storage; as well as the more familiar elements such as more tree cover, enriched biodiversity, and more open green space.

4.10 We particularly welcome the recent announcement by the Secretary of State for Environment, Food, and Rural Affairs on the forthcoming review of the ecological network. The work will provide for greater connectivity, by ensuring landscape around and between protected areas is ecologically coherent, improving vital “wildlife motorways” as a cornerstone of adaptation.

4.11 Green infrastructure has enormous potential to be a vehicle for effective and efficient adaptation of the built environment. But it is a potential not yet realised.

4.12 The existing green space network was designed primarily for amenity, recreation and conservation purposes. Consequently much of it may not be entirely fit for purpose with respect to optimising its adaptation functions—although green space still has a value as a “wildlife motorway” linking urban and rural habitats.

4.13 In future, adaptation functions need to be built into green infrastructure, rather than green spaces being continually rebadged, assigning climate-change functions to them that are incidental rather than deliberate.

4.14 Within the existing policy framework, there are a number of barriers to its potential being fully realised, for example:

- (a) Green infrastructure, the environment, and climate change do not yet enjoy a high profile in any single conversation.
- (b) None of the existing standards and codes covering the built environment cover green infrastructure or factor in its benefits to incentivise take-up; targets for delivery apply only to new Ecotowns, a fraction of the potential and the need.
- (c) The planning system does not look at whole-site functionality and the contribution of green infrastructure to immediate and future goals, leaving the underlying health of the environment unprotected and undervalued.
- (d) A fundamental worry for local authorities regarding GI and green space, and a barrier to embracing adaptation, is long term funding. There is no statutory duty on them to manage green spaces and so funding is subject to regular cuts, especially during a downturn.

4.15 There are developments on the national policy front which are beginning to break down barriers to green infrastructure delivery (see Annex 1(c)). Perhaps most importantly, they will help to counter the culture within parts of the planning and development sector which views green space as an optional extra.

4.16 Considering green infrastructure, climate change and health costs together may present fresh opportunities for understanding and managing the costs and benefits of adaptation in the long and short term.

4.17 For example, the currency used in healthcare is the QALY (quality adjusted life year). The accepted cost to add one year of life with good quality is about £30,000. So it would be possible to calculate the number of QALY’s saved by increasing the amount of green space that offsets the urban heat island and reduces heat related deaths.

4.18 The multiple benefits offered by some otherwise simple-sounding measures like green infrastructure cannot be realised for the community without understanding and valuing the full range of its benefits to society, the economy, and the natural environment.

Rural “green infrastructure” (fully operational, multi-functional landscapes)

4.19 Reducing the incidence and severity of flooding in the long term rests on a mixture of measures according to the needs of each geographic (not just administrative) area.

4.20 At present, much fluvial flood risk management addresses the symptoms (often at very great cost) and not the causes. If continued, it is likely that expenditure will continue to rise in real terms.

4.21 To address the causes, we need adaptation to climate change in the upper rather than catchments, and for catchments to be understood properly as part of a living, fully functional landscape.

4.22 The inclusion of catchment schemes in the 2009 Price Review (PR09) has been welcome, but the scale at which adaptation and functionality is optimised is at the full landscape scale, not just at the catchment scale.

4.23 The policy framework needs to demand and enable catchment wide planning and decision making, which will require that the multiple agencies involved collaborate effectively on goals of joint importance, working across existing administrative boundaries. EFRAComm’s recent report on their pre-legislative

scrutiny of the Draft Floods and Water Management Bill made related comments.⁴ Effective and transparent collaboration needs to be built on open sharing of data between relevant agencies, also commented on by EFRAComm.

4.24 Linking the benefits of urban, rural, coastal and green infrastructure can be aided and embedded into local practice through the establishment of area wide “adaptation partnerships” similar to those which operate in some other countries.

4.25 These may emerge from existing arrangements to facilitate the requirements of the Water Framework Directive or they may be entirely new.

4.26 Adaptation is not just the responsibility of Government, although Government leadership will always be required. Private land owners and home owners also have a responsibility to enable the country to adapt sustainably.

4.27 The delivery of green infrastructure is currently (and properly) a responsibility shared across several departments of Government. A mechanism to ensure the delivery of green infrastructure (securing the many benefits it offers) across departmental boundaries could be usefully explored.

4.28 Defra have convened two groups drawn from across Whitehall and statutory advisers on aspects of the environment, one which co-ordinates the Domestic Adaptation Programme, and the other which has acted as a stakeholder group to shape the reporting power on adaptation. Both groups have underlined the usefulness of cross-Whitehall collaboration and the need to monitor progress on joint endeavours.

5. THE FUTURE POLICY FRAMEWORK

5.1 There remain many other policy levers, eg agri-environment schemes, CAP reform, regulation of the water industry, which also play a vital role in translating national adaptation policy into the delivery of adaptation. These policy levers should be reviewed to ensure that they support and not undermine sustainable adaptation.

5.2 Achieving our renewable and low carbon energy targets must not run counter to the needs of sustainable adaptation, and adaptation and mitigation must not be treated as competitive or counter-weighted alternatives. Done well, adaptation aids and speeds efforts on mitigation.

5.3 Future assessments of value for money should be based on sustainable adaptation and a healthy, resilient natural environment if the nation is to maximise the value of Government investment and retain the use of naturally produced ecosystem services.

5.4 Payment and grant schemes, such as regeneration grants and European regional development funds, should in future require applicants to plan for and report on sustainable adaptation.

5.5 In addition to reporting on financial probity, government departments and the wider public sector should be required to report on non-financial measures, which indicate the extent to which their actions add up to sustainable adaptation, eg the impact of policy and delivery on the capacity of the natural environment to adapt successfully.

5.6 The regulatory frameworks overseeing key sectors, eg the water industry, should also be reviewed to ensure that they send the right signals, requiring sustainable adaptation.

5.7 Annex 1(b) provides two examples of issues to be addressed in the water industry sector. These examples illustrate the need to ensure that “second tier” policy making—whether through policy guidance or regulatory and financial levers—is fully aligned with sustainable adaptation, part of the Government’s overall policy objectives. At present, this is far from the case, as the examples in Annex 1(b) illustrate, and it is in the misalignment of policy objectives and second tier policy levers where failure is most likely to occur.

5.8 Future legislation—domestic, European, environmental and non-environmental, first and second tier—therefore needs to be designed to ensure that it doesn’t unintentionally run counter to the needs of sustainable adaptation.

⁴ EFRAComm Report on the draft Floods and Water Management Bill September 2009

- Local authorities’ strategies—Defra must explain how the national plan will relate to local spatial planning. Local authorities are already responsible for the spatial planning process, and this Bill also gives them a remit for flood and coastal erosion risk management planning. Authorities will have to fit the two together and synchronise the cycles for revising and updating their plans.
- Recommend that Defra consider whether guidance on data sharing, including the safeguards that should be in place, should be provided for in secondary legislation.

6. THE ROLE PLAYED BY THE NATURAL ENVIRONMENT IN ENABLING ADAPTATION FOR HUMAN SECURITY

The role of woodlands

6.1 England is one of the least forested countries in Europe, with only about 9% tree cover compared with 37% in the EU as a whole (Forestry Commission 2008). Tree planting and appropriate woodland management is an effective and sustainable contribution to achieving a wide range of climate change objectives.

6.2 Woodlands can manage important environmental risks, which will increase with climate change, such as soil erosion, agricultural runoff, rise in water temperature and consequent declines in water quality, and flooding (Caissie 2006; Conlan *et al* 2007; Sugden *et al* 2008). Trees also regulate the local climate and provide shelter from wind and storms to protect crops, livestock and soils, as well as supporting important pollinating insects (Sugden *et al* 2008; Escobedo *et al* 2009; Merckx *et al* 2009a, 2009b). Growing trees to produce timber or wood fuel help farmers spread the social and financial risks from climate change (Sugden *et al* 2008). All these services are likely to become even more important to society under the extreme climatic changes that four degrees would bring especially as flooding, water pollution, heat waves, droughts and unpredictable conditions become more frequent and severe (Murphy *et al* 2009).

6.3 Trees play an increasingly important role for human health and recreation in a 4+ degree world. In cities, there would be vital shade and temperature regulation benefits for people by increasing the number and area of trees in urban landscapes (Gill *et al* 2007; Escobedo *et al* 2009). In the countryside, woodland areas may become increasingly important as cool places where people can enjoy the outdoors, away from the summer heat.

6.4 In addition to its adaptation benefits, woodland provides a major carbon sink by sequestering carbon within its timber and maintaining soil carbon stores (Choudrie *et al* 2008); in some cases mitigation may be best achieved by sustainable timber harvesting for fuel and materials (Nabuurs *et al* 2007). Even where such wood is used for fuel it saves carbon by substituting for fossil fuels, and where wood is used in construction there is a double saving—stored carbon in the timber, and the savings arising from reduced use of steel.

Keeping blanket bog in good condition tackles both adaptation and mitigation

6.5 Blanket bog is found across the UK, including in the English uplands where high rainfall and poor drainage frequently result in waterlogged conditions; the largest areas are in the Pennine Hills.

6.6 Blanket bog provides a number of ecosystem services with a direct bearing on the quality of human life (O'Brien *et al* 2007); two of the most important are carbon storage and water supply.

6.7 The peat is a substantial store of carbon, which has built up over thousands of years and healthy bog continues to steadily remove carbon from the atmosphere, although there may be small releases of methane through decomposition (Thompson 2008).

6.8 Catchments covered with blanket bog are a major source of water supplies for large numbers of people in the Midlands and north of England. They are also areas which can support low intensity sheep grazing and contribute to a highly valued landscape with a well developed tourist industry (Usher & Thompson 1988).

6.9 Blanket bog can be degraded by a range of factors including drainage, over-grazing and air pollution (O'Brien *et al* 2007). In a degraded state, soil erosion leads to the release of carbon and a changed hydrology with poorer quality and more variable water supply and increased risk of flooding downstream, increasing the costs borne by householders, water companies, water bill payers and local authorities.

6.10 Climate change is likely to exacerbate this degradation particularly if summer droughts become more frequent.

6.11 The solution, restoring blanket bog, safeguards service provision and increases resilience of these services to climate change as well as protecting conservation interests. There are already efforts being made to block grip drains and increase water levels in some moorland areas to improve bog condition in order to maintain carbon storage and water resources.

Management of rivers and catchments to safeguard homes, communities, infrastructure and economically vital ecosystem services

6.12 Appropriate management of rivers and catchments is crucial to both the provision of clean water and the management of flood risk, along with a range of associated services.

6.13 Climate change projections (Murphy *et al* 2009) suggest that we will see both an increase in summer droughts and in extreme flooding events and these are likely to be increasingly severe as we approach a 4+ degree world.

6.14 Where rivers and their catchments have been degraded by channelisation, pollution, excessive water abstraction and destruction of riparian vegetation, they will be less able to provide the services society requires.

6.15 Restoration of floodplains with healthy natural ecosystems which naturally regulates flow will greatly improve their ability to store and absorb large flooding events. This affords protection to built-up areas and greatly reduces the scouring impacts of large water flows down rivers (Wheater 2006). Restoring riparian vegetation can also guard against water pollution, the risk of which is likely to increase with climate change (Caissie 2006; Sugden *et al* 2008)

6.16 Elements of natural floodplain ecosystems such as wetlands also have the potential to store water at times of excess and gradually release it back into the environment, reducing the frequency and impact of local drought and flooding.

Managed realignment of coastlines to protect communities and infrastructure long term

6.17 In a 4+ degree world, sea-levels may rise substantially, threatening large parts of England's coastal areas with inundation, particularly those on the eastern and south-eastern coasts. Hard defences, such as sea-walls will be very expensive, become increasingly costly to maintain, and potentially unsustainable, against the continued erosive forces of the sea.

6.18 Working with nature, using salt marsh and other coastal habitats to create more storage space for high tides and to reduce the energy of the sea before reaching such defences, can cut costs and greatly increase sustainability (Defra 2005).

6.19 Managed realignment involves breaching sea walls and letting the sea advance to cover the land behind it. In most cases, new flood banks are constructed behind the wall that is breached; the sea covers the land between the old and new defences and intertidal habitats are gradually established (Dixon *et al* 2008).

6.20 The techniques are neither new nor untested. There have been over twenty realignment projects in the UK designed either for habitat conservation or flood risk management or both, the largest of which, at Alkborough on the Humber estuary, protects 90,000 hectares of land and 300,000 properties from sea level rise. In addition, it has produced new recreation opportunities to benefit the local community both directly through increased tourism, as well as significant conservation benefits (Environment Agency undated; Dixon *et al* 2008).

Maintaining and increasing biodiversity to increase resilience and protect ecosystem services

6.21 Living with extreme climate change will demand our leaders to make some very difficult decisions about society, our economy, and the environment on which are lifestyles are based. The natural environment performs a number of functions and provides multiple benefits through these, but in advocating the role of nature conservation as a way of ensuring the continuation of a fully multi-functional natural environment, we accept that this presents decision makers with many hard choices.

6.22 If policy makers use the existing language of trade-offs, they will need to better understand the costs and benefits (not just monetary, but ecological and social) of the likely trade-offs between different services and to develop decision-making models to help make the optimal choices.

6.23 If the trade-off debate persists, then the evaluation of trade-offs must fully recognise the cost-effective benefits that natural environments provide and will increasingly provide in a 2+ and 4+ degree world.

6.24 Sustainable adaptation will ensure that while safeguarding life, property, and economically vital ecosystem services, the intrinsic value of the natural environment is protected for future generations too.

Annex 1(b)

7. OFWAT'S—REGULATORY REGIME—THE PRICE REVIEW PROCESS

7.1 Ofwat have tried to set up a longer term 25 year framework in this current price review (PR09) through introducing a requirement for water companies to produce 25 year Strategic Direction Statements.

7.2 This process has helped water companies set out longer-term adaptation/mitigation needs, but investment is still constrained within the five-year process and is dependent upon cost benefit analysis and must be supported by customers.

7.3 In reality the costs and benefits of longer term planning are not always easy to describe and customer priorities tend to focus on the immediate provision of good quality drinking water. At this current stage in the PR09 process a number of water companys Strategic Direction Statements are no longer consistent with Ofwat' draft decisions (Draft Determinations).

7.4 The Price Review five year investment cycle is not alignment with the Water Framework Directive (WFD) cycle—which runs over six years and made an attempt to align with the statutory Water Resource Management Plan (WRMP) cycle introduced this time—but so far only 10 (out of 22) company WRMPs have been approved by the Secretary of State—the remainder are going to inquiry, appeal or need to provide further information, therefore will not complete in time to inform Ofwat's final determinations on PR09.

7.5 The WRMPs are 25 year plans—and once signed off by the Secretary of State companies need to deliver them—but they only have commitment through the Price Review process to investment for five years.

7.6 Suggested remedies:

- (a) Need to align the Periodic Review process with River Basin Management Plans and Water Resource Management Plans.
- (b) There needs to be a more flexible approach to investment within the 5 year cycle to enable longer term adaptation/mitigation.
- (c) Should Ofwat have less stringent cost benefit analysis (CBA) requirements or better define their CBA requirements to enable longer term investment planning? Our preference would be the latter because Ofwat's CBA methodology in general is not clearly defined.⁵

7.7 An EfraComm report into PR09 (July 2009)—set out a recommendation that Defra provide Ofwat with clear guidance on the application of CBA and that Ofwat's guidance should be clear and unambiguous. The report also included a recommendation that Defra should consider if changes are needed to the regulatory regime to ensure that water companies have incentives to take early action to adapt to climate change.

7.8 OFWAT's current regulatory focus has been said to discourage green infrastructure solutions in favour of hard engineering solutions which have an asset value and so are better able to boost shareholder value than "soft" engineering solutions. Yet in many instances "soft engineering" measures may be far more sustainable and increase the resilience of our natural systems, in contrast to the consequences of some hard engineering alternatives.

Annex 1(c)

8. GREEN INFRASTRUCTURE—BARRIERS WITHIN THE POLICY FRAMEWORK

8.1 The existing green space network was designed primarily for amenity, recreation and conservation purposes. Consequently much of it may not be entirely fit for purpose with respect to optimising its adaptation functions—although green space still has a value as a "wildlife motorway" linking urban and rural habitats.

8.2 In future, adaptation functions need to be built into green infrastructure, rather than green spaces being continually rebadged, assigning climate-change functions to them that are incidental rather than deliberate.

8.3 Within the existing policy framework, there are a number of barriers to its potential being fully realised, for example:

- (a) Green infrastructure, the environment and climate change do not yet enjoy a high profile in any single conversation, so the synergies are unrecognised and so undervalued.
- (b) Although the Code for Sustainable Homes standard for new homes includes "ecology" in the mix of criteria at the higher levels, this is not framed in a way which fully acknowledges the contribution of green infrastructure to climate change adaptation. This is a weakness because it fails to make the social and economic case for sustainable urban adaptation and deprives home owners of those benefits as design features when they make a purchase.
- (c) The zero-carbon homes standard is largely about insulation standards, and doesn't allow developers to factor in the climate change benefits of green infrastructure—so do not count towards the zero carbon targets. This is a weakness because it does not encourage developers to retain or create adequate areas of green infrastructure.
- (d) The planning system does not currently look at whole-site functionality and the contribution of green infrastructure to immediate and future goals. Therefore the assets, eg natural watercourses and drainage patterns, boundary and shade trees, encapsulated areas of mature woodland, wetlands, and the underlying health of the environment is not protected and its functionality is too often compromised.
- (e) Accessible Natural Greenspace Standards (ANGSt) is the only widely promoted standard, but it is not about adaptation, and only has advisory status at present. Green infrastructure provision within "Accessible Natural GreenSpace" Standards' has been largely related to accessibility for health and recreation. As such, the standard is not related to the area of GI needed to provide climate change adaptation benefits, for which there is no standard available, but one we believe is required.
- (f) The evidence base on how much green infrastructure is needed remains weak and incomplete, exacerbating the problems with developing and setting any improvement to the ANGSt.

⁵ References:

Defra's Social and Environmental Guidance for Ofwat (August 2008)
<http://www.defra.gov.uk/environment/quality/water/industry/review/documents/ofwat-guidance080922.pdf>

- (g) Although Government policy provides general support for green infrastructure (eg PPS 9, PPS 17, Ecotowns prospectus) there is no binding national policy requirement nor statutory standard for the provision of green infrastructure associated with new housing development. Consequently, developers and local planning authorities may not understand Government expectations in terms of provision for green infrastructure.
- (h) Furthermore, with pressures on budgets for infrastructure, and the removal of ring-fenced funding for green space in the Growth Area Funding programme for 2008, local authorities may be unwilling to prepare green infrastructure strategies; and developers unwilling to pay for habitat creation, enhancement, or long-term management.
- (i) A fundamental worry for local authorities regarding GI and green space (and therefore a barrier to them embracing adaptation) is long term funding. There is no statutory duty on them to manage green spaces and so funding is often described as hand-to-mouth and subject to regular cuts, especially during an economic downturn. Vesting green spaces in not-for-profit Trusts (as per Milton Keynes) is one alternative but not appropriate or achievable everywhere.

8.4 There are developments on the national policy front which are beginning to break down barriers to green infrastructure delivery (see below). Perhaps most importantly, they will help to counter the culture within parts of the planning and development sector which views green space as an optional extra.

- (a) All of the designated Growth Points⁶ must, as a condition of their Growth Point status and extra funding, prepare GI strategies.
- (b) Planning Policy 12 (Spatial Planning) now references GI alongside other infrastructure needs that should be addressed in Local Authority Core Strategies.
- (c) The Government's Quality of Place Strategy published earlier this year committed Government to producing new Planning Policy Guidance for GI. This should be included in the new Planning Policy Statement which will combine PPSs 7, 9 and 17.

5 October 2009

Witnesses: **Dr Helen Phillips**, Chief Executive and **Dr Tom Tew**, Chief Scientist, Natural England, examined.

Q1 Chairman: Good morning and welcome. I will keep the introductions to a minimum because we are driving through on quite a tight timetable this morning; we have about 30 minutes or so, and we have two more sets of witnesses after you. Thank you very much for coming in. I know that we have had fruitful private contact as well about this and other issues but it is very helpful to have you on the record this morning, so thank you for that. Can I start off with a general question? The Climate Change Act and the Adapting to Climate Change Programme have created a new framework for managing adaptation. Do you think that puts the natural environment at the centre of the adaptation agenda?

Dr Phillips: I think that the framework is evolving very rapidly and within Defra's core adaptation programme I think the natural environment is pretty fully recognised. The challenges are about how it is we make sure that this joins up across Whitehall and across government because so much of the dependence of the adaptive response relies on a healthy natural environment. So, for instance, if decisions are being taken about renewable energy we need to think about it in the round. We have had a lovely example from DECC recently where the reality of coastal erosion and the importance of designated habitats have been reflected in their decision around Dungeness not to proceed with that as a proposed nuclear site. However, we have other examples: for example, in CLG where we are

somewhat at the pinnacle of strategy perfection about green infrastructure and its benefits, but yet we have a number of blocks and barriers in the system seeing it being implemented and delivered at a substantial scale the length and breadth of the country. I think that this possibly links into the issue about costs and benefits. There is a tendency that is almost unavoidable, but must be avoided in this case, to look at costs and benefits in a particular suite of circumstances and we need to be thinking about the costs and benefits across government. The example I give there is the Department of Health, where of course green infrastructure can substantially have a positive impact on urban cooling and health in depth related to heat. So we need to be thinking while we are planning green infrastructure about what the implications are for the Department of Health and their proposed future expenditure on issues such as that. Finally what I would say is about the importance of the natural environment not being seen as something that can be traded off within any framework. It is not something that is to be traded or balanced with something that is to be another fundamental building block on which the whole adaptive response is considered. Also, I suppose, the responsibility on us as environmentalists to find a currency and a language that is better understood. We had a modest attempt at that ourselves in a recent publication called *No Charge*—something of a play on words—about the importance of long-term investment in the natural environment. It is about how it is that we can show

⁶ The 49 areas where local planning authorities are willing to pursue housing numbers over and above what they are obliged to deliver.

what the benefits are beyond intrinsic benefits from the environment, but how it is that it props up and sustains the social and economic benefits.

Dr Tew: I think that last point is absolutely key. There are two very good reasons for enabling the natural environment to adapt to climate change and one, of course, is a moral imperative that we have to allow our plants and animals to adapt, but the second is that a healthy natural environment is the best mechanism to allow us to adapt to climate change, and that is why a healthy natural environment should not be left in the environmental ghetto or with Defra and that is why cross-Whitehall attention on a healthy natural environment is so important because an unhealthy natural environment has implications for health, transport and lots of other things. So in the national framework, where you have the four work streams of evidence, awareness, measuring progress and policy, and you have a thematic approach where the environment is one theme, it is important that the environment does not stay in that ghetto. That is why Treasury, Health and all the other departments need to understand the importance of a natural environment, as Helen has explained.

Q2 Chairman: Accepting the importance of the natural environment what happens if a department or, indeed, a public body simply does not take account of the natural environment when they are making their adaptation plans?

Dr Phillips: I think there will be a huge cost to the taxpayer in the longer term. Nicholas Stern's report has been extraordinarily influential in terms of mitigation and governments across the world understand the fact that it is much more cost-effective to invest early in what will inevitably turn out to be more modest sums. The fact that we are locked into a certain amount of climate change already, despite whatever our parallel efforts might be on mitigation, that needs to be a very concerted programme; it needs to be good adaptation rather than bad adaptation, and we need to recognise, of course, that properly planned adaptation can also support mitigation measures. So if we do not we will frankly pay quite dearly.

Q3 Chairman: Can you hold up a warning flag if you see this happening in another part of the country?

Dr Tew: That is why the design of the reporting powers and the adaptation economic assessment are crucial bits of work to get absolutely right because the second will illustrate the financial foolishness of maladapted, unsustainable adaptation; and the first will direct government departments and local authorities to report in a transparent way on what they are doing and how they are taking the environment into account.

Q4 Colin Challen: What opportunities does Natural England have to influence policy on adaptation? Do you think you have enough influence and, if not, perhaps you could explain where there are deficiencies and how you might be able to improve matters?

Dr Phillips: We have talked about an evolving framework and as part of that Defra have created a domestic adaptation programme and we sit on that programme board that is chaired by Defra. We are also part of a very important work stream that sits under that looking at some of the tools and levers that there are to make that come into being, most importantly, of course, the reporting power and how it is that public bodies assess and report on their progress with adaptation. They are important places to play, and of course in our wider statutory adviser role across government we are in a position to advise other government departments on how it is that climate change adaptation could be built in. I suppose that we couple that to an extent with trying to lead by example. So you are probably aware that we spend the best part of half a billion pounds a year in payments to farmers and land managers for good environmental practices on their farms and land. We sourced through the review of environmental stewardship recently to make sure that climate change was an overarching theme and something we could be legitimately tackling as part of those payments rather than something we try to find opportunities to do as we went round the country. Our current estimate is that emissions from agriculture will be 11% higher than they are currently was it not for the measures that have been put in place through environmental stewardship. Of course, we also have opportunities through our pretty close interactions with other bodies, such as National Parks and Areas of Outstanding Natural Beauty, where there is a real opportunity to be at the forefront of land management practices, and so much of the adaptive response, of course, is dependent on land management practices.

Q5 Colin Challen: You have said that the potential for green infrastructure has not yet been realised or perhaps even fully understood by Government. Given that, I have just had a letter from a company in my constituency that makes permeable paving complaining that local government also does not really recognise its responsibilities in this regard. What do you think can be done to address that?

Dr Phillips: We really urgently need to get away from a situation where we understand the benefits of green infrastructure, where we have fabulous examples of how it can be done well. On our website our best seller in terms of downloads used to be about newts and protected species and as soon as we put up a new best practice guide giving 36 examples of how to do the green infrastructure well we had something like 1,000 hits within a couple of weeks and this rapidly went up the agenda. We seem to be engaging with the community of the engaged and we do not have simple but mainstream ways of making green infrastructure happen and in our view there are some very simple things that could be done. The first is that we are in the middle of a review of planning policy guidance with a number of planning policy statements being brought together and in those it would be enormously powerful if targets could be set in terms of the amount and the quality of green infrastructure. Some standards have been set in the

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context of eco towns but, as we know, that is on the margins of development rather than in the main thrust and the main stream of development. Whilst I would be loathe to indiscriminately foist more targets on local authorities who are often beleaguered measuring things, I think a matching indicator of progress against that target in planning guidance would change the landscape. In addition to that—and this goes to the issue of quality—we need to make sure that the green infrastructure is seen as a deliberative response in our approach to adaptation rather than the incidental re-badging of local amenity or local conservation sites. Not that amenity and conservation sites are not very important, of course they are, but, as we know, green infrastructure can be so much more in terms of trees, urban cooling, shading and, indeed, the matter you have come across in your constituency, about sustainable drainage, balancing ponds, soaking up the storm water run-off.

Q6 Colin Challen: On your website do you also put up examples of worst practice?

Dr Phillips: No, we do not.

Q7 Colin Challen: Is it worth considering?

Dr Phillips: We are getting close to that point. I am a great believer in encouraging good practice and in fact we have gone a bit further with writing in and congratulating local authorities who are doing it particularly well, and we are encouraging that sharing of good practice. We are considering though, in the not too distant future, perhaps letting local authorities see how they are doing not only on green infrastructure but perhaps around a suite of measures such as the indicator that they have currently on biodiversity and, indeed, the responsibilities that they have for biodiversity under the NERC¹ Act. I think it is always a fine balance, is it not? There is so much that can be achieved once this properly captures the imagination, and once they understand what the benefits are to the local economy in terms of considering a whole site for development, that they are not considering housing units but actually considering that entire amenity. So I think with that whole site one has real opportunity. As, indeed, has the Government's initiative on zero carbon homes where we are thinking about the quality of the built environment but we are not thinking about the quality of the associated natural environment that potentially has huge implications for the longer-term running costs of that neighbourhood.

Q8 Colin Challen: Do you come across much evidence of, shall we say, moral hazard where people think that by not adapting to climate change nevertheless the Government will act as insurer of last resort and just pay for anything that goes disastrously wrong? I am not saying that this is true of any part of the country that is currently afflicted by floods, but if you believe that the Government will pay for the rebuilding of your destroyed bridges

then you may decide that is not a current priority for capital expenditure and you will just make things last a bit longer. Everybody is under a lot of financial pressure at the moment.

Dr Phillips: Absolutely, and the issue in that regard that is most frequently talked about in the context of green infrastructure is maintenance costs. So often it is easy, either through development contribution or, indeed, through the local authority's own capital grants to put things in place in the first case but then there is often real anxiety and, indeed, a lot of evidence that they are not looked after in the long term. There is that lovely example in Milton Keynes where a lot of the green space has been put in public trust. It works there; there is no reason to say it will work everywhere, but we do need to think about what those mechanisms are in the longer term and that the whole life cost is a consideration rather than the more short-term consideration.

Dr Tew: The examples that you raise get to the crux of the problem here, which is equity, inter-generational equity and, indeed, spatial equity. Who bears the cost of coastal erosion or flooding? This is a deep societal challenge. Part of the argument, of course, is to say that the insurance companies will mop up after the floods but it is the premium holders that pay for insurance costs and it is more expensive to pay for the damage than it is to manage the Uplands and prevent the damage. These are deep issues of equity that is the problem.

Q9 Joan Walley: In what you have just said you have stressed the importance of the cost cutting agenda across Whitehall and I am really looking at the role in the Treasury in all of that. I am interested to know how you think the signals that the Treasury is actually sending; to what extent they are supporting and enabling adaptation. I wondered what your comments are about how effective the Treasury is in getting the right messages across.

Dr Phillips: I always think that Treasury is to government what the national curriculum is to our collective desire to have schoolchildren taught things. There is no getting away from the fact that they are very pivotal to this and there is one comment I would make before Tom says some more. That is we were really pleased to see the work that the Treasury and Defra have done together in the supplementary guidance on the Green Book, and that could be quite an important driver in terms of investment.²

Q10 Joan Walley: I am sorry; did you say updated guidance on the Green Book?

Dr Phillips: Updated, supplementary guidance on the Green Book in the context of climate change.

Q11 Joan Walley: How is that effectively sending out messages about what needs to be done?

Dr Phillips: The Green Book is something of a bible for those who are thinking about making investment or de-investment decisions and it talks very fully about the important principles of sustainable

¹ Natural Environment and Rural Communities

² HM Treasury, *The Green Book: Appraisal and Evaluation in Central Government* (and Supplementary Guidance)

development and, by implication, sustainable adaptation. I suppose one criticism of it would be that it talks about effectiveness and efficiency and equity; it does not explicitly talk about the natural environment. Consequently, our concern would be that when people come to do cost benefit analysis they think literally about the cost and, as we all know, sometimes the environment is a marginal cost where there is a lower cost solution but does not give you a sustainable solution in the long-term. So if we could see a more explicit reference to that I think it would make a big difference. As it would if we made sure that whatever it is we were measuring in terms of progress towards climate change adaptation included a measure about the quality of the natural environment because unless we have a response to adaptation which is based on an investment in the natural environment and that all measures are actually leaving a more resilient natural environment we will not have the fundamentals in place for that longer-term response.

Dr Tew: Absolutely. We think that the Treasury are trying hard and they are moving and it is very welcome, but one sometimes thinks that they think the environment is someone else's job rather than it being a job for society, and I think that was probably reflected in the National Audit Office assessment.³

Q12 Joan Walley: It is a bit of a bold comment to make, is it not?

Dr Tew: The one I have just made?

Q13 Joan Walley: Yes.

Dr Tew: I think that the environment is everyone's responsibility and we are trying to provide costed examples to illustrate why putting the environment at the heart of adaptation is the most cost-effective solution for society and that is why I think the economic assessment of adaptation is critically important.

Q14 Joan Walley: Can you tell me when the latest revision of the Green Book came out because the perversely called Green Book has been a matter of concern to this Committee for a long time because we have not really felt that it has been doing green things, although it might be called the Green Book? Which update are you talking about in terms of the revision to it?

Dr Phillips: The supplementary guidance published in June of this year.

Q15 Joan Walley: Because that does not come along very often, so are you saying then that that supplementary guidance is absolutely fit for purpose?

Dr Phillips: No.

Q16 Joan Walley: You are not?

Dr Tew: We are saying that the supplementary guidance, which talks about effectiveness, efficiency and equity, is a good place to start defining sustainable adaptation.

Q17 Joan Walley: But would it not have been better to have actually got it right rather than just doing something that now needs to be changed and adapted and adapted even further?

Dr Tew: We do not think that it has the environment at the heart of the guidance in the way that we would like.

Q18 Joan Walley: So how are you or how is Defra or how is this Committee going to put pressure on the Treasury to get the environment at the heart of that Green Book so that it can genuinely be a Green Book from the Treasury that is underpinning investment decisions across Whitehall?

Dr Phillips: Could I give you an anecdote from the publication of our recent report called *No Charge*, which will share the difficulty we had and possibly the difficulty that Treasury are having?

Q19 Joan Walley: Please do.

Dr Phillips: We set out with grand plans for this publication and were very much hoping that we were going to build the report up to a crescendo on the back page that would show investment strategies for five, ten, 15, 20 years, saying that if you invest this much in the natural environment the payback or, indeed, the cost avoided will be as much, so there is a very clear example of an investment strategy for a relatively long period of time that says this is a no-brainer. Despite having used our own best brains and having worked with colleagues in academia, and indeed elsewhere, and environmental economists there was a lot of anxiety, despite a lot of encouragement from me and others to do just this, about the quality of the evidence and about how robust it was. So instead we ended up publishing a report that contains about a dozen fabulous case studies, they are all peer reviewed, they are all assessed and there are not holes or flaws in them and consequently we can hold our head high about people who produce evidence-based studies, but invariably we find ourselves looking at examples. There is a lovely example about the importance of investing in the Uplands in terms of retaining water, reducing flooding impact downstream, about reducing cost to water companies of cleaning up water when it gets to the treatment works, about the benefits to biodiversity. There is a similar lovely example about the end-cost benefits of managed treatment; for example, on the Humber Estuary moving the flood bank back and creating intertidal habitat has afforded much greater degree of protection to homes and to land at a lower cost and with much less requirement for ongoing revenue to contain that. So until such a time as we create a greater awareness and indeed more confidence that these are indeed cost beneficial ways and sensible investments for the long term, and until such a time as we can find a way of mainstreaming that into the language of economics rather than pointing out good examples of where it has happened, there is a degree of nervousness of putting this as a requirement or imposition on others.

³ National Audit Office, *Adapting to Climate Change: A review for the Environmental Audit Committee*, July 2009

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Q20 Joan Walley: But surely that is the role of Defra's Adapting to Climate Change Programme, to actually influence the Treasury to do just that, because you say until the time comes when we can do it but we do not have the time to do it because the time to take action is now?

Dr Tew: Yes, and the Cross-Whitehall Programme Board illustrates the desire and the willingness for co-operation across government. The problem is that the cost is this equity issue—who bears the cost and who pays the cost—and that is spread across time and space and these are complicated decisions for local planning authorities to make. We think that by illustrating, using examples as Helen says, one or two clear cases, over the course of 20 years it is cheaper to realign the coast than it is to build a concrete flood wall. It is simply cheaper over 20 years; there are less maintenance costs and there are more positive side-effects and those side-effects include carbon sequestration and nutrient recycling and commercial fish species and places for people to go and enjoy and they are more resilient than a concrete wall and they are more adaptable to any future changes. Those illustrations are hard won. We are looking at existing realignment schemes and it has taken ten or 15 years to start to report on them. So I have sympathy for Treasury, it is not easy to come up with quick and clear examples of why it always makes economic sense.

Dr Phillips: It does underline the case though for having planned adaptation and a wide scale plan about the extent and scale and pace of the adaptation measures we are going to put in place and consequently the reporting framework we have talked about and behind that its progress towards that rather than some indiscriminate measures of things that might help in the future.

Q21 Dr Turner: You have embedded adaptation throughout all of your operations in Natural England, which seems to put you well ahead of most government departments. How have you approached that job: top-down, bottom-up? Could you tell us about how you evolved your strategy?

Dr Phillips: I am happy to tell you. It is like most things, I think it has met in the middle. There have been some top-down initiatives and a lot of innovation from the ground up. To give you a few examples of some of the stuff we have done. We inherited as an organisation a framework about the character of England. The English landscape is divided into 159 character areas, and some decades ago we beautifully described those and, indeed, we went to the trouble of describing the pressures of those areas of landscape. Somewhat surprisingly, we never described what the desired response in any of those landscapes would be; nor did we think—and perhaps not unreasonably at that time ago—what the desired response under various scenarios of climate change would be. So we have taken four of those areas and done just that. I suppose not surprisingly we see both differences depending on the type of habitat, whether it is the Cumbria High

Fells or the Norfolk Broads, but also a degree of similarity about the things that need to be done, which often involve making sure that the habitat that is in good condition is kept in good condition; where there are opportunities to extend it it is extended; or where it is in poor condition it is restored; and, indeed, that the land management practice is such that it is keeping that land in good condition. What we really thought was important—and this is some work that Tom is leading for us—was to expand that into looking at the functions that are provided by a healthy ecosystem because there are a lot of functions that we are dependent on land managers to produce that only the natural environment can produce; that we need to be very careful to guard the public funds that are used currently to incentivise various practices to reduce those things that only those folk can provide for public good rather than necessarily or exclusively personal gain. So we are doing that and that will then form the basis of a very important contribution to our own adaptation framework. We are also working alongside others because you know that this is quite a big responsibility on public bodies, so Anglian Water, for example, would obviously be very much at the forefront of this in an area that will become increasingly water stressed. We are working alongside them and ensuring that what their response looks like perhaps will provide a good example more widely across the water industry. From our own perspective we have agreed with Defra to become a voluntary reporter under the scheme, so hopefully we will be able to help others in that way too.

Dr Tew: If I may make one other point, which is that across all of our work programmes, which we organise into communities, each and every work programme is being asked to complete an assessment of the threats and opportunities for their work presented by climate change, and to identify responses and actions; and we are now writing guidance for the staff to know how to do that. We will have an internal programme board to review what that looks like as a whole, to review the independencies, to agree overall risks to our work programme and then to embed actions and resources for dealing with climate change in our corporate plan, and that is the kind of thing, as Helen says, that we have volunteered to report to Government as an exemplar of good practice.

Q22 Dr Turner: Fine. What do you find to be the benefits of incorporating climate change in this way into your risk management and what lessons can you draw from your experience for other central Government departments seeking to embed adaptation into their programmes?

Dr Tew: We are delighted to be finding that it is cheaper and more effective to adapt and to prepare for climate change than to deal with the consequences afterwards. There is evidence for that in our management of our own sites, in our influence over National Nature Reserves. It is better to

prepare and plan ahead, and those are the lessons we draw. We are finding, in purely financial terms for instance, that our own target to cut our own carbon emissions by 50% in two years not only clearly has an input to society's mitigation but actually is a cheaper and more cost-effective way for us to work. It raises a whole suite of challenges for our staff, but it saves us money and makes us more effective and contributes to climate change.

Q23 Dr Turner: Can you point to any practical examples which prove that this approach is working?

Dr Tew: Practical examples of mitigation I just talked about there of cutting carbon. Our people are travelling less; we have fewer offices open; we are encouraging flexible working and that is saving us money.

Q24 Dr Turner: Can you point, for example, to where extreme weather events have produced results which are not as bad as you thought they might have been in other circumstances?

Dr Tew: I see. That is very difficult and that is a challenge for us who espouse the doctrine that sustainable land management in the Uplands will reduce flooding because you have no control and then you get a one in a thousand year event, as we had last week, and people say to you, "That did not work then, did it?" So that is a significant challenge. As Helen says, we are setting up three very large pilot projects in the Uplands and I am working very closely with the Research Councils of this country to put in place monitoring in those projects because we have to start attempting to address that question. We would like to demonstrate how a new approach changes land management—in other words, land managers are rewarded for delivering a range of services and change their management accordingly—and produces a change in ecosystem services, such as better flood defence or higher quality; and we would like to demonstrate how that also produces a higher environmental quality, but it is not something you can do overnight.

Dr Phillips: Very briefly, if I may, to take a link between your question back to Ms Walley's question, which is about urgent action is required now and we cannot wait until we have all the evidence in place, and I really could not agree with you more. That is something that we are trying to do in our review of our Sites of Special Scientific Interest notification strategy, because you get detractors who say, "Why are you protecting all these places? Under climate change scenarios they will no longer be important for the species or habitats they are designated for; why are we continuing to make this big investment?" To which there is a fairly simple answer, which is that they are the areas that have been most heavily invested in, the highest quality natural environment and despite what the natural succession might be in them they will still be more resilient as we experience higher temperatures and more variable patterns. The other evidence that is coming to the fore, albeit that it is

less well based than we would like, is about the importance of connectivity and connecting different areas of habitat. So we are now trying to make sure that our notification strategy in the future and, indeed, for instance some of our work on initiatives such as the coastal path are actually thinking about where there is a real opportunity to join places up so that when species do inevitably have to move inland, uphill or north that there are more opportunities for them to do so. Also, and in fact I am sure that this will come up in the Secretary of State's announced review of ecological designations, how it is that landscape designations and ecological designations might come together because we are often talking about having to work on a much wider area, on a landscape scale rather than a site scale, so could those landscape designations that have been very successfully looking after areas of great beauty or areas where there is real opportunity for amenity and recreation legitimately bear a wider set of criteria that would also take into account some of the things that we need to do in response to climate change, where we could get large tracts of land for that purpose, not in a way that excluded other uses but in a way that could be integrated alongside places where people live and work.

Q25 Mr Caton: In your memorandum you made the point that future monitoring and reporting arrangements should include measures to show whether adaptation is leading to a healthier and more resilient natural environment. How should this be done, by whom and do we already have the measures and the data sources to be used?

Dr Tew: I think you are hinting at the answer there, which is that what we cannot do is throw all our environmental monitoring schemes away and start again. We already in this country invest significantly in environmental monitoring and, indeed, Natural England supports or runs many of those programmes. There is a wide range of environmental monitoring that we already do and that now needs to be bent to answering the question of whether we are adapting successfully to climate change; and it needs to do so in an integrated way. We think that the future of monitoring is integrated monitoring and we are working closely with everyone else who is involved in this field via the Environmental Research Funders Forum to look at synergy between monitoring, to look at cost-effective and streamlined monitoring and to look at novel techniques in monitoring, for instance satellite monitoring and so on. All of our existing monitoring schemes must now bear in mind that we need to start answering the question of how we are adapting to climate change and whether that adaptation is being effective, and that will range from everything from understanding whether butterflies are migrating north via the data collection of thousands of volunteers, all the way to a satellite-based analysis of sea level rise and coastal geomorphological changes. A significant gap in the evidence base and in monitoring are these indicators of adaptive process and then indicators of effects,

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and the Committee will know that Defra are working on this at the moment and we are working closely with Defra. One of the things that we mentioned earlier, for instance, is green infrastructure. There may be some very good proxies

for measuring societal response to climate change adaptation, so we think that all of those need investigating.

Chairman: Thank you very much. We very much appreciate your coming in.

Supplementary memorandum submitted by Natural England

THE COMMITTEE HAS SOUGHT OUR FURTHER VIEW ON THE OPPORTUNITIES TO INFLUENCE ADAPTATION POLICY IN DEFRA AND OTHER DEPARTMENTS.

Natural England has a number of opportunities to inform Defra's policy development, through good informal liaison as well as more formally through arrangements like Programme Boards. Our advice on adaptation policy is welcomed by Defra officials, and during meetings of the Domestic Adaptation Programme Board, by assembled representatives of other Government departments too. Our engagement with DCLG on green infrastructure has also been received positively, perhaps because they recognise that the topic is part of their remit. We welcome any opportunity for closer engagement with departments in addition to Defra.

The extent to which government acts on the advice of Natural England or any of its other statutory advisers would need to be examined over the coming months.

The subject of adaptation is very broad and has been necessarily "chunked down" into parcels for the attention of different teams and departments. Joining-up policy across departmental boundaries is challenging: two areas which obviously need to be fully joined-up are mitigation and adaptation, so that measures to mitigate climate change do not limit the environment's ability to adapt sustainably, nor that poorly planned adaptation measures end up exacerbating the rate of climate change. The two must work in concert and be mutually reinforcing.

The challenge faced by Government (and the natural environment) is to ensure the swift and effective translation of national policy into national, regional, and local delivery by bodies other than Defra. This wider community, made up of local planning authorities, water companies, energy generators and distributors, the waste industry, transport, land owners, agriculture, private businesses, and the public is what will actually deliver full adaptation through its understanding, buy-in and ability to translate words into action.

This so-called "implementation gap" is not peculiar to Defra or to this Government, but is a recognised risk for policy makers seeking delivery of policy provisions. Policy may be made at a national level but it then has to be interpreted, refined and delivered at an increasingly local level—this can obviously add great value to the original policy, taking account of local factors which were unknown nationally or making use of technical expertise held by delivery bodies, for example. Sometimes though, it can also lead to poor interpretation and non-implementation.

In a single organisation, reporting on delivery would be undertaken through performance management: in the public sector this arrangement has been translated into targets and data returns. The political tide is against targets, and is moving towards rights for service users and taxpayers. Unfortunately, the natural environment does not have recognised rights which are articulated other than through bodies such as Natural England and the many members of the public who value and take pleasure in the natural environment. We believe there is a need for both indicators and targets for the natural environment, underpinned by continued scrutiny of progress.

We welcome the opportunities for greater scrutiny provided by proposed publication of departmental adaptation plans, future reporting on local authority progress on adaptation indicator NII88, later this year the publication of adaptation risk assessments undertaken by public authorities called on under the new reporting power, and the future national risk assessment currently under development.

These first rounds of reporting should result in a range of opportunities for improvement being identified and exploited in future rounds, but we mustn't lose any focus on the need for results and meaningful progress toward the long-term goal of sustainable adaptation.

The breadth of government and other public institutions, coupled with the increasingly complex nature of public life means that every statutory adviser has to engage with a greater number of networks, teams and individuals nationally and locally in order to impart their advice. As a delivery body, Natural England has considerable levels of engagement with decision makers on a county and regional basis through our local teams.

HOW NATURAL ENGLAND CAN INFLUENCE THE GOVERNMENT-WIDE VIEW OF COSTS AND BENEFITS OF CLIMATE CHANGE ADAPTATION

The Committee has also made enquiries related to green infrastructure, seeking our views on:

(i) *Whether the overall costs and benefits are appreciated across government*

Natural England believes that the benefits of green infrastructure are not well appreciated (or acknowledged) across central or local government, nor across the development industry.

It is still too often viewed as an afterthought, a nice to have aesthetic addition as opposed to a fundamental part of designing and engineering our neighbourhoods, towns and cities.

There are individual pieces of research from the USA, the findings of which should stimulate greater interest across Government. For example, the city of Philadelphia calculated that its parks alone (one part of green infrastructure) produced \$1.1 billion worth of savings to the city administration, some 100 times the level of city spending on those parks. New York calculated that the city's trees (a small part of green infrastructure) benefited the city by \$122 million pa compared to their spend of \$22 pa (so for every \$1 spent, the city gained \$5 in benefits).

The green belt is part of the necessary network of green infrastructure. There have been some attempts to value the greenbelt, with results ranging from £26 billion to (most recently) £300 billion, depending on the methods used. While we do not have an estimate of our own, our sense is that £300 billion is probably an under-estimate of the value of the green-belt.

(ii) *If there are specific mechanisms that can be used*

We offer the following suggestions:

- Green infrastructure, the environment and climate change should be part of single conversations between DCLG, Defra, DECC, and Homes and Communities Agency so the synergies are recognised and valued.
- The zero-carbon homes standard (and that for non-domestic building currently out for consultation) should allow developers to factor in the climate change benefits of green infrastructure—and count these towards the zero-carbon targets.
- The planning system must look at whole-site functionality and the contribution of green infrastructure to immediate and future goals.
- There should be a binding national policy requirement or a statutory standard for the provision of high quality and functionally valuable green infrastructure.

(iii) *What could be done to improve understanding*

At present, decision makers locally and nationally are not well served by either an accessible, complete evidence base or costed case studies which would illustrate the costs and benefits of green infrastructure as a core component of planning and development.

There are agencies (and many private professional contractors in the business) which would be well placed to contribute to costed case studies, and those (including Natural England) which would be well placed to further develop, and make accessible, the evidence base.

As a topic which cuts across departmental boundaries, it is possible that green infrastructure suffers from the lack of an acknowledged “owner”. Departmental ownership and government leadership needs to be made more obvious and the case studies and evidence base commissioned during 2010–11.

There are many anecdotal findings that public officials struggle to locate suppliers and contractors for green infrastructure, and those where suppliers are said to struggle to find local authorities who are sufficiently well informed to commission green infrastructure from them.

Clearly there is some “match-making” to be done as well, perhaps starting with a compendium of green infrastructure providers and materials which industry could perhaps lead on.

11 January 2010

Memorandum submitted by Water UK

SUMMARY

1. Our key comments are concerned with:
 - (a) The crucial role of water at the forefront of dealing with the impacts of climate change.
 - (b) The need for clarity and consistency in cross-government and regulatory support for adaptation measures.

- (c) The uncertain impacts of climate change, which should be openly acknowledged and addressed, and not used as an excuse for inaction/delay.
- (d) The importance of working in partnership across sectors to manage the impacts of climate change most effectively.
- (e) The synergies between adaptation and mitigation and the need to ensure that adaptive measures are consistent with national greenhouse gas reduction targets.
- (f) Reporting frameworks for adaptation, which should be aligned and consistent with requirements by government and regulators in other areas.
- (g) The protection of critical national infrastructure, which may not always be cost beneficial using existing accounting assessments.

INTRODUCTION

2. Water UK is the industry association that represents regulated UK statutory water supply and wastewater companies at national and European level. We are a policy-based organisation and represent the industry's interests with Government, regulators and stakeholders in the UK and in Europe. Our core objective is sustainable water policy—actions and solutions that create lasting benefit by integrating economic, environmental and social objectives.⁷

3. We have been encouraged by the lead that the UK government has taken on adaptation. We support and are closely involved in the ACC programme. For example, Water UK sits on the adaptation partnership board and many water companies take a leading role in regional partnerships.

4. Our members are active in all the regional climate change partnerships where they seek to engage and share knowledge and responses to climate change with other stakeholders.

IMPACTS OF CLIMATE CHANGE ON WATER

5. Water is where many of the impacts of climate change will be felt first and most acutely. It is imperative that we get it right in our sector, because every other sector of the economy is dependent on the services we provide. This puts the water industry at the forefront of adapting to a changing climate.

6. Climate change will impact all areas of the water industry. For example:

- Water availability will be affected by changing weather patterns and we will need to build additional infrastructure, for example winter storage capacity.
- Demand for water is likely to increase.
- Reservoirs will be impacted in terms of operation, quantity, quality and structure.
- Pipe systems for both drinking water supply and sewerage will be more prone to cracking as climate changes lead to greater soil movement, as a consequence of wetting and drying cycles.
- Colour and odour problems will result from higher temperatures and more intense rainfall events.
- Assets on the coast or in flood plains (that covers most of them) will be at increased risk from flooding, storm damage, coastal erosion and a rise in sea level.
- Dams will be more prone to siltation resulting from increased soil erosion, and the slippage risk to soil dams from intense rainfall events is also increased.
- Existing sewerage systems were not designed to take climate change into account. This means that more intense rainfall is likely to exceed the capacity of parts of the network and cause local flooding.
- Lower river flows and reduce the dilution of wastewater effluent. We may need additional treatment to meet higher standards which are likely to be achievable only by using energy-intensive processes with all that means for greenhouse gas emissions.

7. Continued adaptation is essential to maintain high, reliable levels of service. It is not a once only activity. Water companies have a wealth of experience in planning for climate change and have for many years been working to embed the effects into long-term plans, based on the best available evidence and extensive research.⁸

8. Water UK has developed an approach to incorporating climate change across the industry (A Climate Change Adaptation Approach for Asset Management Planning, 2008). This is freely available on request and identifies the nature of potential climate change, how this might impact on company operations, and possible responses to mitigate these impacts. In effect it provides a useful checklist and framework of the available responses to developing climate change.

9. Water UK also recently hosted the first projections-in-practice event following the launch of the UKCP09 projections.⁹

10. Given the nature of the impacts on water, it is crucial that all policies and measures around adaptation take full account of the role of the water sector.

⁷ A list of Water UK members is available at <http://www.water.org.uk/home/our-members>

⁸ Further information can be found at <http://www.water.org.uk/home/policy/climate-change>

⁹ A summary of this event is available at <http://www.water.org.uk/home/news/press-releases/water-sector-launch-ukcp09>

SUPPORTING ADAPTATION IN WATER

11. Adaptation to climate change is a key component of both water company Strategic Business Plans and Water Resource Management Plans. Indeed, there is a statutory duty for companies to consider the effects of climate change on supply of and demand for water. These plans are produced every five years and (in England and Wales) thoroughly audited by Ofwat and the Environment Agency (EA). They incorporate an assessment of the projected impacts of climate change over the lifetime of the plan and an investment programme which takes account of the need to adapt. These plans are widely consulted on and publicly available.

12. In addition, water companies in England and Wales recently published Strategic Direction Statements describing their aspirations for the next quarter of a century. Adapting to and mitigating climate change was a key aspect of these statements, within the overriding common aim of sustainable service to customers, the community and the environment.

13. Generally, measures proposed and incorporated into company plans are within the remit of water companies. These include changes to infrastructure but also less tangible measures such as water efficiency. However, they require regulatory support and approval.

14. A key concern for the industry relates to the lack of support for adaptation measures and the conflicting expectations and requirements. For example, despite the strong lead from government and explicit guidance from the EA, Ofwat has not allowed any climate change driven investment related to water resources for the period 2010–15, because the “evidence available to companies when they prepared their final business plans was out of date”.¹⁰ In these circumstances, programmes and policies proposed in a water company’s plan may never come to fruition, unless the implementation of those programmes and policies becomes a statutory obligation.

15. Clearly, a supportive regulatory framework is crucial in a heavily regulated industry. Whilst companies can identify the need for and propose actions to address climate change, they cannot be implemented without regulatory approval.

DEALING WITH UNCERTAINTY

16. There is a significant degree of uncertainty associated with the potential impacts of climate change, and many of the impacts are not expected to be fully noticeable until some way into the future. This has led to suggestions that we should wait until the science is more certain, or we should focus on more pressing issues where the economic benefits of action are clearer.

17. However, the impacts of climate change on water are already being felt. The water sector also has long-lived assets and long-term planning horizons. As a result, we need to plan for impacts up the end of the century, and potentially beyond. The recent UK Water Industry Research report, *Climate Change—A Programme of Research for the UK Water Industry*, looks at risks and adaptation options to 2100.

18. The water industry is used to dealing with uncertainty. For climate change, it comes from a range of different areas, eg emissions pathways, modelling, impacts on precipitation and impacts on run-off. Information from UKCP09 is already allowing water companies to consider a broader range of uncertainty, providing a much richer picture than ever before.

WORKING IN PARTNERSHIP

19. There are many areas where the water industry cannot deliver solutions to climate change alone, including diffuse pollution, surface water management, sustainable urban drainage, and the more efficient use of water. These require partnership working. We would suggest that the adaptation sub-committee of the Climate Change Committee has a key role to ensure that the interdependencies between organisations, agencies and government bodies are picked up and that these links form part of the national risk assessment.

20. For example, it is not possible or sustainable to separate decisions about land use planning from water management. The water industry owns and operates some surface water drainage systems, some of which are combined with foul water drainage systems. These systems are generally designed to drain areas of wastewater and surface water. However, our members have had little influence on land use in the catchment areas and this lack of control means that following periods of heavy rainfall, systems may be overwhelmed and result in flooding which may be very distressing for citizens particularly as flood water may be mixed with sewage. The reasons for this include increasing urbanisation, poor planning control, rising impermeable surface area, land use in the catchment, flood prevention schemes such as raising river banks and climate change. Together, these contribute to the pollution of watercourses and may impact on achieving “good status” for the Water Framework Directive. Solutions to this problem include attenuating flows and reducing volume of rainwater entering combined sewer systems, better surface water management planning, overland flow routes, sustainable drainage and sacrificial areas for flooding.

21. The water industry is already working with and helping to finance other sectors to implement catchment protection measures, which deliver water quality outcomes as well as helping to adapt to climate change. In fact, the UK water industry has put forward proposals in business plans covering 2010–15 for

¹⁰ Ofwat’s draft determination did allow limited funding for the protection of prioritised strategic assets from flood inundation.

over 100 innovative catchment management schemes. This involves working with stakeholders and other land owners/managers across catchments to deliver a range of water-related benefits, including flood protection, at lower overall cost.

22. For water efficiency, this is dependent on behaviour and requires education and awareness, in addition to measures such as making existing buildings more water efficient and developing a clear water efficiency labelling system. Again, the industry has led the way by setting up Waterwise, an independent organization to promote water efficiency.

23. Adaptation measures must also be sustainable and measures taken by one sector should not undermine adaptation in another. Examples of this maladaptation are nitrate-intensive agricultural practices encouraged by Common Agricultural Policy incentives and the need for large quantities of water to support bioenergy crops.

LINKING ADAPTATION AND MITIGATION

24. A key principle for the UK water industry is that action on climate change should address both adaptation and mitigation in parallel. The impacts of climate change on water management are extremely serious and must be adequately planned for. But provision of water services also has an impact on climate change. The UK water industry accounts for around 2–3% of total UK energy use and 1% of total UK greenhouse gas emissions, which has been increasing steadily.

25. There is no doubt that some existing EU Directives, whilst benefiting the water environment, have resulted in significantly higher emissions, primarily as a result of increased energy-intensive treatment. Concerted effort is needed by all sectors to reduce emissions, if the worst impacts of climate change are to be avoided. We would therefore expect all action at a European or national level to demonstrate how it has taken account of the recently revised Commission RIA guidelines. These state “it is important to identify environmental impacts where relevant, and then to place a monetary value on them. An example of an area where this can be done is for the release of a unit of carbon dioxide (or other greenhouse gases).” The use of these guidelines will help identify and deliver the most sustainable overall solutions.

26. This is likely to include innovative solutions such as catchment or seasonal consenting, diffuse pollution source controls, infrastructure charge rebates for developers who provide surface runoff reduction measures, etc.

27. More specifically, most local water quality issues have in the past been addressed through relatively expensive and energy-intensive end-of-pipe solutions. There is increasing evidence to suggest that controls introduced at source (for phosphates, nitrates, etc) could both reduce the amount of energy required to remove these from the aquatic environment and ensure our ecosystems are higher quality and more resilient to the impacts of climate change.

28. Positive links between adaptation and mitigation can be found in other areas. Using water more efficiently both reduce the amount of energy (and carbon) associated with abstracting, treating, distributing and heating¹¹ that water, and that also means that more water is available for the natural environment or other uses, enhancing our ability to cope with the impacts of climate change. So awareness, information, incentives and regulation to promote water efficiency is key.

29. Therefore, we need policy makers, regulators and others to recognize the links between adaptation and mitigation and to promote “win win” policies that do not potentially increase emissions.

REPORTING

30. Water companies will be covered by the new statutory reporting power on adaptation. Given that climate change is already embedded within existing systems in the water sector, we have suggested to Defra that water company adaptation reports largely consist of signposting to the relevant sections of business plans, water resource plans and other pertinent material. We have also suggested that, to reduce the burden on companies and ensure consistency, Water UK works with Defra to coordinate a standard reporting format for water companies that would meet the requirements of the new power and minimise the need for additional reporting.

31. We would also expect the government to explain clearly how potential conflicts involving the government and regulators will be resolved. For example, the reporting authority may not receive funding from the economic regulator to implement plans agreed by the Secretary of State. This situation has occurred recently with statutory water resources plans, where ministerial directions have conflicted with the determinations of the economic regulator.

32. Finally, we would suggest that the Committee reviews progress on the issues covered by this inquiry once the information from the adaptation reports under the new power are available.¹²

¹¹ Defra has estimated that the heating of water in the home (eg for baths/showers) is responsible for around 5% of total UK greenhouse gas emissions, similar to those for aviation.

¹² Water UK’s response to the recent Defra consultation on adaptation reporting is available at: <http://www.water.org.uk/home/policy/statements-and-responses/climate-change-adaptation-reporting>

PROTECTING CRITICAL INFRASTRUCTURE

33. The water industry is responsible for a range of assets and infrastructure, including water and wastewater treatment works, many of which are located in areas vulnerable to flooding. Although the most critical assets are well-defended and regularly assessed for flood and other risks, the impacts of climate change and poor land use planning means that levels of protection may need to be revised in future. However, given the uncertain nature of potential climate change, the comparatively low probability of flood events and the high cost of additional protection, it is often difficult to make a strictly economic case for action using existing accounting assessments.

34. Indeed, a significant amount of expenditure related to resilience and reducing sewer flooding has been disallowed by Ofwat in the PR09 draft determination.

5 October 2009

Witnesses: **Mr Andrew Brown**, Climate Change and Environmental Performance Manager, Anglian Water; **Ms Pamela Taylor OBE**, Chief Executive, and **Dr Bruce Horton**, Environmental Policy Adviser, Water UK, gave evidence.

Q26 Chairman: Good morning and welcome. We are quite tight for time this morning so we will press on without too many formalities, but we appreciate your coming in. The water industry is clearly in the frontline facing the consequences of carbon change—very much so—not just in this country but elsewhere. Do you think that the statutory framework which the Climate Change Act has established puts us on the right path for adaptation?
Ms Taylor: Yes, we certainly do. We have been very pleased to see that adaptation has been brought into the Climate Change Act; that was exactly what was needed. As you quite rightly say, water is the place where we will feel it most. If you get it right in every other sector but you get it wrong in water then as a nation and globally we will fail. So, yes, it has been very important to us that adaptation has been brought into the Act, and that is good.

Q27 Chairman: Defra's Adapting to Climate Change Programme has also established an organisational framework, is that the right sort of approach as well? Is that going to be efficient in promoting adaptation measures?

Ms Taylor: Yes. I think that the work Defra is doing is good. One of the things that we do not yet know is how well plugged in the work that Defra is doing is across all government departments and also how high up it is plugged in there as well. It is no use if a small group of people are doing some very, very good work but if they are not actually having the impact and the influence that we need across government then really their work will be wasted. So we certainly do need to make sure that we support them sufficiently, but it will take more than just us in order to support them to make sure that happens.

Dr Horton: If I could just add to the point that Pamela made earlier. It is really important with the profile of climate change that all the good work that Defra and the Government has been doing over the last year or two really takes a step forward. If you look at Copenhagen coming up next week I understand that although adaptation is on the agenda, references to water have been removed from the text that is going to be discussed.

Ms Taylor: Which is absolutely stunning.

Dr Horton: If water is central to the impacts of climate change then that seems like a lost opportunity in terms of being able to raise the profile of what we need to do as a nation.

Ms Taylor: That is a perfect illustration of what we are saying, that you can have good intent with the Act; you can have some very good people working very constructively with us in Defra, but where it really matters, where it really hurts in terms of making things come about and change, such as Copenhagen, we do not see water there and this is just crazy.

Q28 Chairman: As a Committee with a cross-departmental remit we are quite familiar with the difficulty of getting genuinely good intentions from one department reflected in what other departments are doing.

Ms Taylor: Exactly. Also there is the question of whether other sectors who are not part of Defra's remit recognise and understand the role that they have regarding adaptation and whether they have understood what role they will need to play in the future because many other sectors—we are talking about the future that we are feeling the impacts of climate change now in the water sector—are not necessarily recognising this and so for them the future is too far away for them to feel they have to be doing something about it now, and we must work in partnership.

Q29 Dr Turner: Lord Stern identified that imperfect information on the impacts of climate change is a potential barrier to adaptation. What do you think that the Government should do to address gaps or imperfections in the information? Does the Government have the adequate scientific capacity at its core to provide the information that is needed?

Ms Taylor: We have been pleased with the information that we have been given and the projections that we have been given, so we are certainly not complaining that we have not had the information we would like and we are certainly not complaining that information is not as adequate as it could be. The thing that really matters now, particularly in the water sector, is what we need to do now is more modelling than you could ever imagine in your lives in terms of actually using well the

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information that we have already been given. That is the key thing. Certainly, for example, Andy in Anglian, if it would be okay to give an illustration of the kinds of things that you would need to do in order to make that work for you.

Mr Brown: Yes. Certainly the 2009 projections with the addition of probabilities is a great enhancement on the projections that we were using in the past. We were lucky enough to be involved in the development of that and in the use of the dummy data, actually feeding back information to UKCIP⁴ and looking at how that can be incorporated into modelling river levels and the impact that will have on filling reservoirs under various scenarios into the future. We see climate change as it is a risk to the business and so we approach it as we would any other risk to our business. The more information and the better the quality of information the better, but we will use the information that we have to work out the risks to our business and plan for the future. What we can look forward to, and what we might ask the Government, is the other agencies that we are involved with and inter-dependent with have the right resources in order to be able to do the work that they would need to do to support our industry.

Q30 Dr Turner: Could you tell us then how water companies in particular are starting to use the climate change projections model for the UK? What sort of adaptations are the water companies starting to introduce?

Dr Horton: If I could kick off with that? When the projections came out—even before they came out—as Andy said, we were working with UKCIP to look at what information would become available and how we would use that because it is really complex and you have a number of different scenarios and the scenarios get multiplied as you look at what might happen to emissions and how that impacts on whether high, medium or low emissions and anything in-between will impact on things like precipitation and how that impacts on river flows and how that impacts on the amount of water that we have available, which is obviously our key resource. We did work very closely with UKCIP and Defra. We held the first Projections in Practice event, which is a means of rolling out the projections and we now have projects, one research project that is being finalised now and others that have been planned to look at what impact the new projections will have on demand for water, what impacts it will have on water availability for a range of different sources of water, from reservoirs to river flows, and so on. Probably the main thing is trying to take account of the uncertainty because, as Andy said, it is one risk amongst others. We have to plan for projected growth; we have to plan for pollution of the water environment and how we take account of that; the economic circumstances in which we find ourselves. So we need to build it into the risk framework, but given the complexity of the new information that takes quite a lot of time and quite a lot of resource to do properly and most effectively.

Q31 Dr Turner: The kinds of problems that you are likely to encounter basically boil down to either too much water at any given time or too little. Presumably for either of those extreme ends of risks you need to undertake a certain amount of investment and physical adaptation. Could you tell us something about your thinking on that?

Ms Taylor: The companies actually worked on the projections when we were submitting our evidence. Each company submits its own evidence, its case, if you like, to the economic regulator, Ofwat. The companies worked on the projections that they had available at the time, which were not the 2009 projections but the 2002 projections. At that time the Environment Agency and Government were encouraging us to work on those projections because they were the only ones we had, so that is what was used by the companies. So the companies did the work and put their case to the economic regulator as to what would be required in terms of resilience and whatever else would need to be done in terms of climate change, but the economic regulator in its wisdom decided that because the information was 2002 and not 2009 that in fact they would not allow it. So we are facing at the moment probably over £1 billion worth of investment that we should be seeing in this coming five year cycle having at the moment been crossed out. We personally, the industry, do not think that is a way properly to deal with climate change and to take it into account. That has been a great setback for us. We understand that waiting for the 2009 projections would be ideal, but I do not think anyone was feeling that in the few months that they were late, if you like, coming to us that suddenly the 2009 projections were going to say, “Phew! It is all right, there is no such thing as climate change and you need not plan for it.” It was more than a disappointment because with a long-term industry you cannot do that. For example, some companies were putting in that they are upgrading their sewers now and those sewage systems, as we know from replacing Victorian mains, are expected to last for quite a long time, but the ability to plan and to add in planning for climate change to upgrading a sewage system has been crossed out by Ofwat in some circumstances and that makes no sense at all for a sewage system that you are actually upgrading at the moment.

Q32 Dr Turner: Presumably the required investment of about £1 billion—

Ms Taylor: Across the industry.

Q33 Dr Turner: Has been delayed or has not happened.

Ms Taylor: Yes.

Q34 Dr Turner: Presumably you must have some approximate estimate of the size of risk through damage, through lack of that investment that it implies?

Ms Taylor: That is exactly what individual companies are looking at right now because their so-called final determinations, which is, if you like, the final decision of Ofwat, they only received last week.

⁴ United Kingdom Climate Impacts Programme

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Many companies have, in fact, been working lots of people through the night looking at what it is they are being offered as the package by Ofwat and it is a very complex package. Companies have up to two months to look at that and to be able to either object or say, "Okay, we can deal with this". So the picture is not clear yet, but certainly that estimate of over one billion stands up at the moment.

Q35 Mr Caton: Every water company has to consider adaptation as part of its 25-year strategic direction statement, as part of its shorter-term strategic business plan and water resource management plan. Is this mix of long and short-term planning a good approach to tackling climate change and are there lessons for other bodies?

Ms Taylor: It is a very good way of doing it. The thing is, though, whether then having established the way of doing it you then allow that process to happen on the ground. Yes, companies welcomed the idea of the 25-year strategic direction statements; certainly climate change was taken into account very much so in those statements. Companies also produce water resource management plans where climate change is taken into account as well. When you look at the Water Framework Directive then the river basin management plans take climate change into account too. So this all looks lovely, but then you have to say that if you have a price review—which as you know once every five years we do and the people who hold the ring for that are the economic regulator—every five years the price review ought to be a step on the road to that longer-term planning and implementing that longer-term planning. Where it falls down is if companies feel—and this will vary from company—that in fact it has not been a step on the way but has been a short-term, "Whoa, let us be careful here" or "Let us take a shorter-term look at this rather than a longer-term"; or "Let us try to keep the prices as low as possible"—obviously we want to do that for our customers—some short-term things inevitably start crowding in there and the thing is do the short-term things crowd out the longer-term planning? So the process is good but how it is implemented individual companies will want to look at that.

Dr Horton: What we are looking for overall is consistency between the high level aspirations of Government and how we want to adapt to climate change as a nation and the role of the Government agencies and bodies to make sure that that is actually implemented. Pamela mentioned Ofwat, Andy mentioned the Environment Agency, Natural England and our other key regulators as well, and we need to make sure that they have the funding, resources and ability to take account of actions that we need to take to adapt to climate change.

Mr Brown: If I could just add to that point. There were elements of climate change adaptation which did make through into some of our final determinations, so there were positive points and there has been movement. We have funding for a number of the top priority fluvial flooding protection schemes for our critical water

infrastructure; so there are positives. Steps have been made but we have to constantly think about that 24-year vision, if not further.

Dr Horton: A lot of the actions to adapt to climate change are actually consistent with good practice business anyway and I do not think we are suggesting that you need to invest billions and billions of pounds in what might turn out to be a white elephant because some of the impacts of climate change do not turn out to be exactly as we thought they might have been. In the water industry we are really focusing on adaptive management which is making sure that the investment we make now makes sense anyway but makes even more sense if you look at the impacts of climate change, so things like leakage management, resilience of our assets and water efficiency. Those are the kinds of things that incrementally over time you can invest in and make good sense anyway, and if you add in the impacts of climate change then that makes good business sense.

Q36 Joan Walley: I am getting lots of different conflicting messages. You have said that the latest Ofwat review was a setback—that was how you described it—yet it seems to me from the evidence that you have given us that there was a very strong steer from Government that the regulator should be taking onboard the whole issue of adaptation, and that steer seems to have been backed up by a recent report of the Defra Select Committee, yet in the 2009 Price Review it seems that we have an economic regulator without any basis for encouraging sustainability and the long-term issues. Why do you think that Ofwat did not follow the Government's lead on this and how much of a problem is it?

Ms Taylor: We do not know why they did not follow the Government lead and it was a lead obviously from Government; it was also a lead from the Environment Agency. Also, as I was saying earlier, it is something that the water companies had been encouraged obviously to do and we had wanted to do that and to play our part in terms of planning for the impacts of climate change. We do not know why Ofwat did what they did; we can only say that over a billion so far probably has been lost to us in terms of investment to address climate change and that is investment that is lost. The need for investment obviously will not go away.

Dr Horton: I would say that I think progress is being made and we are quite encouraged by some of the progress that Ofwat has made in the last couple of years. They do have a climate change team now which they did not have in the past.

Ms Taylor: And they are good.

Dr Horton: They have issued position statements and policies on climate change, which is quite new for them actually. If you look at where they have come from they have made quite a lot of progress in quite a short space of time. What we are looking for really is to think, after this price review about how the regulatory framework in general works and does it deal with the long-term challenges in the right way because if you have this five-year system of operational expenditure and investment that is

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clawed back after five years it disincentivises long-term investment and actions with long-term benefits, and climate change adaptation is a classic case where you have long-term benefits and those are really hard to bring into essentially a five-year review programme.

Q37 Joan Walley: You are rushing to defend Ofwat and earlier on you talked about it being the economic regulator and I wonder whether or not you feel that the remit of Ofwat falls short of what it should be because it seems that there does not seem to be this environmental sustainable aspect of it at the core of its regulatory function. Would you agree with me on that?

Ms Taylor: It links to the question we were being asked earlier: did Ofwat set out a process that was good? Yes, it did. Is it better than processes we have ever had before? Yes, they were. Has Ofwat now got a good team, a very good team when it comes to climate change? Yes, they have; they are very impressive. Did we think we were embarking this time on a really long-term look at the sector helped, I must say, by Defra's Strategic Review, which was a very, very good government review indeed? Yes to all those things. At the last minute did too many short-term things crowd in? Possibly, yes. So individual companies will feel the impact of whether there has been too much short-termism and whether that balance has been struck incorrectly. Individual companies, as I say, have up to two months to study what it is that they have been given by the economic regulator; so there is the potential for us to be in a much better position than before. The process was far better than before in terms of looking at things longer term, but has the actual fact at the end of it given us that longer-term look? We do not believe it has. Individual companies will be the judge of that. Will we play our part, as Bruce was saying, in terms of looking at regulation in the future, making sure that long-term environmental considerations can be taken into account? Yes, we will. Will we also play our role in making sure that all the things that impact on climate change, whether it is population growth, whether it is the way in which you deal with flooding, the way in which sustainable urban drainage is owned or not owned, where the funding comes from, all those things, we will not just sit on our hands and say that it is too difficult; we will play a role in that. Yes, we do need joined-up regulators, government, to help us to do that in partnership.

Q38 Joan Walley: Nonetheless, despite all of that the net effect of the recent determination is that there is going to be a delay in climate change in investment in water resources. What is that going to mean not just for the water companies but for those of us all around the country struggling to deal with the problems of the need for adaptations?

Dr Horton: For the next five years you will not see any obvious impact because, as Pamela said, water resource planning does take a 25-year view.

Q39 Joan Walley: We have got to be planning now for the next five years ahead, have we not?

Dr Horton: Yes, and Ofwat has allowed a notified item for climate change and water resources, so there is the opportunity if companies think it will make a significant difference over the next five-year period for them to make a case to Ofwat within the next five years. So they have left the door open a little bit. I think what we are looking for really is for some consistency and some clear early indication of how climate change is going to be treated, and whilst we might not see any tangible impact for the next five years if we do not see more clarity and consistency from the next AMP⁵ forwards we would start to have concerns then because at the moment a lot of the impacts of climate change, as you know, do not really kick in until the 2030s and 2040s and that does give water companies a window on the water resources side to be able to plan for those main impacts of climate change in terms of additional resource or additional demand management.

Ms Taylor: You were looking for examples. One example would be, as I was saying earlier, if you are upgrading your sewage system right now then it would make sense to be allowed to take into account climate change. If you are looking at the resilience of your infrastructure it would make sense to be able to take that into account now. I think perhaps the damage, so-called, would also be in companies feeling when is it that we are able to be sure that if we look longer term that we can now begin to act in terms of what needs to be done now in order to get the split for the future. As I say, I do believe that Ofwat have some extremely good climate change people and I am very hopeful that from now on they will be listening more closely to them.

Q40 Joan Walley: The evidence-based analysis of adaptation, which Ofwat has promised subsequent to the review, does that mean that there is a clear process for that to happen? How will that be funded?

Dr Horton: I think we need to see more details of what the post review adaptation plans of Ofwat are. At the moment I think it is a good idea after the Price Review to take stock, as it is in a number of other areas as well, of what has happened, what companies have put in on climate change investment and what lessons we can learn for the next Price Review. I think that Ofwat's approach of recommending a review after the Price Review is a sensible one, but we need to first take those two months, as Pamela said, to be able to see what the actual implications of the final determination are for companies.

Q41 Mr Caton: Your submission said that controlling water quality at source and improving water efficiency can support both climate change mitigation and adaptation objectives. What can Government and regulators do to help water companies basically do the right things in these areas?

Ms Taylor: What we are looking for and what we certainly believe that we have the responsibility to do as well is to see where you can address adaptation and mitigation and get the benefits for both. So if,

⁵ Asset Management Plan

1 December 2009 Mr Andrew Brown, Ms Pamela Taylor OBE and Dr Bruce Horton

for example, you are looking at the way in which we deal with flooding, with flood defences, if we look at the way at the moment we are still continuing to build on floodplains when we should not be, all these kinds of things need to be taken into account because they can help from today and they can help us in the long-term. It is that kind of thing that we want. What we are looking for there is when we already have some of the tools, such as the Water Framework Directive and river basin management plans, where those tools already exist let us begin to use them more wisely; let us use them in a way that not only makes them apply to the water sector, because, my goodness me, we are applying all this because we have an interest on behalf of our customers for making sure that we absolutely get this right. A lot of other people, a lot of other sectors, do not even know yet that they are players and so more needs to be done. I have to say that we had a meeting just recently with the Secretary of State, Hilary Benn, and we were heartened by the fact that particularly when it comes to river basin management plans and so on that he did indeed take the point that more needs to be done in terms of making sure that other sectors, other industries, recognise that they have a part to play as well.

Dr Horton: What we need from regulators and Government is a greater acceptance that you will need some innovative solutions to adapt to climate change. If you look at some of the things that are being trialled in Anglian and other companies at the moment, low technology wastewater treatment systems and so on, that requires a different approach from the regulator because we do have, particularly with the Environment Agency, a very risk-averse approach to water quality and water discharge standards, and that leads us to treat water and waste water to very high standards all of the time. What we really need to look at are things like seasonal consenting, more flexible consenting regimes so that we can meet the same local environmental standards and get the same environmental outcome for the river or the water body, but in a way that is consistent with adaptation to climate change and uses a lot less energy at the same time.

Ms Taylor: That is the crucial thing.

Mr Brown: I was going to add to that. There is an area where we have seen significant movement and that is on the catchment management in this particular planning process. The Drinking Water Inspectorate, the Environment Agency, Natural England and Ofwat have worked with us and many companies across the industry to look at moving away from energy intensive systems of nitrate removal, for example, to look at a catchment-based approach and on protecting raw water quality. That will hopefully reduce carbon emissions but also leaves more water in the environment and better quality water, which is an adaptation issue. So taking that forward over the next five years there is a role to play with some of our regulators in actually getting that to deliver success on the ground.

Ms Taylor: I must say that we are beginning a project now with the Environment Agency which we are really very excited about, which is pretending, if you like, that you have no existing rules, regulations, regulatory regimes at all in the catchment and what would you do if you were starting from scratch? What would you do if you were making everything fit for the future as regards climate change? What kind of regulation would you have? What kind of consenting regime would you have? What would make sense in terms of our carbon impact and so on? We are very pleased that the Environment Agency really does seem up for this and so we are delighted to be working in partnership with them and, true to our word, because we recognise that a partnership needs to be more than two of us, we will be involving many other organisations in this as well.

Q42 Chairman: We are out of time, I am afraid. Thank you very much indeed for coming in, it has been a very helpful session for us.

Ms Taylor: May we thank you and the Committee for taking an interest in this, it is very important to us and we are very pleased that you have. Thank you very much for inviting us.

Supplementary memorandum from Water UK

1. *Ofwat rules covering water leakages require companies to bring down leakages to a level where the cost of saving another unit of water through fixing a leak is the same as the cost of providing a unit of water through a new supply. What is your view of Ofwat rules covering leakages? Should the rules be revised, and, if so, how?*

Water UK participated in a recent Ofwat-led series of studies to review and improve approaches to leakage management within the regulatory framework. This included best practice guidance on including external costs and benefits in the sustainable economic level of leakage (SELL) calculation. All companies follow this guidance, which does provide an acceptable framework for companies to take account of a broad range of costs and benefits (including environmental and carbon impacts, traffic disruption from detection, repair and mains replacement work, etc). Companies do therefore identify the most cost-beneficial and sustainable leakage management strategy within a broader water resource management and strategic business plan.

However, there are some aspects of the current regime that we feel could be improved.

First, the SELL depends crucially on the value of water, which in turn depends on the balance of costs and benefits between leaving water in the environment and abstracting water. Ensuring that the abstraction regime is sustainable is primarily a matter for the Environment Agency (EA). The EA has a responsibility

to demonstrate any cases where existing levels of abstraction are unsustainable (unduly impacting the environment) and to agree a process for remedying these cases. Where the EA demonstrates that a catchment is over abstracted, the SELL should fall.

Second, water companies have undertaken a great deal of customer research to inform their PR09 business plan submissions and recent 25-year Strategic Direction Statements. This research clearly demonstrates that leakage management is important. Many companies have long-term targets to reduce leakage, very significantly in some cases. However, in Ofwat's final determination of prices for PR09, economically justified leakage programmes for many companies were cut back. As a result, leakage levels are expected to remain stable or fall only slightly over the next few years, a situation which falls short of company ambition and customer expectations.

Third, the current approach to setting targets for leakage leads many companies to a sub-optimal approach. The regulator can (and does) impose penalties for failing to meet targets, but does not provide equivalent incentives for out-performance. This leads companies towards a risk-averse approach, avoiding penalties by allocating additional (uneconomic) expenditure to leakage management. This occurred in 2008–09, the coldest winter for many years in most of the country. We would normally expect leakage to rise in such circumstances, but additional effort and investment (taking many companies beyond the SELL) enabled all companies to meet or better their targets. Incentives and rewards for such out-performance should be part of the regulatory contract.

Finally, we believe there is a need for more consistent communication around leakage. Companies are required to follow the SELL approach, but many of the industry's key partners and stakeholders argue publicly that leakage levels should be lower than this. This sends a confused message to the public and undermines the broader case for water efficiency. We think that a common and consistent communication strategy, led by government, would deliver significant benefits.

2. What role should the Adapting to Climate Change Programme take in getting organisations to work together in the first place? Is the Adapting to Climate Change Programme well-placed to fulfil its role?

We have argued that water companies cannot deliver many of the actions needed to adequately adapt water systems to the impacts of climate change alone. Examples include diffuse pollution, surface water management and water efficiency.

We agree that the ACC programme, which will be co-ordinating adaptation work across government departments, is ideally placed, through the national Climate Change Risk Assessment and other projects, to lead and co-ordinate this work. The Climate Change Committee adaptation sub-committee should also have a (more limited) role, eg reviewing overall government adaptation plans.

Given the very different size, structure and regulatory framework of different sectors, it is equally important that government departments and regulators also work together and co-ordinate responses to climate change. An example is catchment management work to tackle diffuse pollution, primarily from agriculture. Ofwat will not allow direct funding from water company customers to the agricultural sector, even where this may be the most cost-beneficial solution overall. This therefore requires other arms of government and its agencies to work with the agricultural sector to address diffuse pollution and ensure the impacts and costs of one sector's activities on another sector are fully taken into account.

Other examples where action is needed to avoid "mal-adaptation" to climate change are nitrate-intensive agricultural practices encouraged by Common Agricultural Policy incentives and the need for large quantities of water to support bioenergy crops.

3. Has the water industry had any success in addressing differences between those who pay for action towards efficient adaptation and those who benefit from such actions, which could arise for example if current water customers are asked to pay for adaptive action which might benefit future customers or other sectors of the economy?

The water industry has had success in these areas. Again, the example of catchment management is useful. Ofwat has allowed funding for more than one hundred schemes to tackle upstream pollution in PR09 (although not including direct payments to farmers). Such schemes have a range of water quality, environmental and other benefits, and reduce the need for expensive, energy-intensive, end-of-pipe solutions.

However, such schemes, in common with much of the water industry's extensive environmental and quality programmes, involve water customers paying to clean up pollution from other sectors. This issue was identified and discussed extensively in the recent Walker Review of Metering and Charging.

In addition, water companies have long-term (twenty-five-plus) plans, which mean that many investments made today will necessarily benefit future generations. At the same time, the high and continued industry investment needs mean that companies effectively borrow from future customers to pay for investment today.

So there is a range of cross-sector and cross-generational transfer payments in the water industry. There are good reasons for this, but there is no doubt that such payments reduce or remove the incentive for other sectors/generations to take action that might be in society's best overall interest.

Many of the benefits of adaptation occur in the long term or to parties other than water industry customers (eg private beneficiaries of flood defence works). It is therefore difficult to justify short-term costs to the economic regulator, particularly when the benefits are uncertain or discounted over time. The government could provide clearer guidance in this area, eg through extending the Green Book on public policy appraisal to specifically cover adaptation for statutory bodies, with a clear expectation that regulators take this into account.

We would encourage government and regulators to look for and introduce positive incentives where possible, for example by removing the automatic right of connection to the public sewer, introducing site-based charging for drainage or tackling diffuse pollution at source. Alongside this is a need for better information so that people and organizations can make more informed choices, for example better water efficiency labeling.

4. *What do you think Government should do to improve awareness of adaptation and get businesses to take action where necessary? What is the best way of providing adaptation advice to business (eg through a specialist body; through general business support organisations, such as Business Links; using climate change aware businesses to mentor SMEs)?*

There are a number of ways to improve communication and awareness:

- Using industry groups and trade bodies such as the CBI and Water UK. We set up and co-ordinate groups on a range of issues, including climate change, which gives our members an opportunity to share information and good practice.
- Ensuring all government departments proactively engage with their agencies, sponsored sectors and key stakeholders on the impacts of climate change and opportunities for adaptation.
- Consistent messages from all areas of government on why climate change matters to them, the potential/likely impacts, simple measures that people and organisations can take, and the opportunities for business development that adaptation offers.
- Extending the adaptation reporting power to other organisations and sectors that will need to take steps to address the impacts of climate change. At present, the power only covers around ninety, mainly large, organisations.
- Utilising partnership-based organisations, especially those at regional or local level (since this is where climate change impacts will be felt). These include regional climate change partnerships, where many water companies take a leading role.

5. *In Q36 we said “if you have this five-year system of operational expenditure and investment that is clawed back after five years it disincentives long-term investment and actions with long-term benefits”.*

At the start of each five-year period, Ofwat makes assumptions about how efficiently companies will be able to deliver their investment programmes. Companies have a financial incentive to out-perform these assumptions. However, at the end of the five-year period, the operational expenditure element is reset and new assumptions are made. Companies only retain the benefits of out-performance for five years. In addition, choosing an operational expenditure solution tends to make companies appear less efficient according to Ofwat’s traditional means of measuring efficiency.

Operational expenditure solutions, rather than capital-intensive solutions, are generally the “softer” measures that are particularly well-suited to climate change adaptation, including catchment management and water efficiency. We think Ofwat could give greater consideration to positive incentives for operational-type schemes.

18 December 2009

Memorandum submitted by the UK Climate Impacts Programme (UKCIP)

SUMMARY

- Recent Government activity has responded to the challenge of adaptation and can now be considered to be on the right path to including adaptation in Government programmes.
- The initiatives prompted by the Climate Change Act, including the Adaptation Sub-Committee, the Climate Change Risk Assessment and the Reporting Powers, clearly demonstrate commitment and provide useful mechanisms.
- Much of this approach is predictably “top-down”. Adaptation work in Government Departments needs to include more “bottom-up” understanding to complement this initial “top-down” approach.
- The Stern principle of investment now yielding benefits in due course is recognised but there is little evidence that this principle is informing current practice of resource allocation in Government or amongst most other agencies.

UKCIP

1. This submission to the EAC inquiry is based largely on UKCIP's work with a wide range of adaptation stakeholders in the UK, its understanding of the issues facing stakeholders, and the expertise that has been gained through this work. These introductory paragraphs provide a brief account of UKCIP's origins, aims and programme.

2. The UK Climate Impacts Programme (UKCIP) helps organisations assess how they might be affected by climate change, so that they can prepare for its impacts. It is based at the University of Oxford, is principally funded by Defra, currently through a contract which ends in March 2011.

3. UKCIP was established in 1997 to help decision-makers generate the information they needed on climate change impacts to plan their response to climate change. A novel methodology was developed to provide this information, placing stakeholders at the heart of the research process. The approach has progressed from managing studies to facilitating the development of effective climate change partnerships and the provision of practical support for a wide range of stakeholders. Development has involved a shift in focus from natural systems to the built environment, and from impact assessments to risk-management and adaptation.

4. UKCIP's unique contribution has been in understanding adaptation practice and in sharing this understanding with stakeholders. So, theory informs practice, practice informs tools and guidance, and the application of guidance informs new theory.

5. UKCIP has gained an international reputation for its work which is probably distinguished by two main features: (a) operating at arm's-length from government and (b) working closely with stakeholders. These continue to provide UKCIP's distinctiveness and underpin its acknowledged success.

UKCIP PROGRAMME

6. UKCIP has been defined as a "boundary organisation" that sits between and facilitates understanding between the three realms of "science", "policy" and "stakeholders".

7. The stated aims of UKCIP are to:

- improve knowledge and understanding of the impacts of climate change among stakeholders; and
- help stakeholders to be better equipped to undertake adaptation to climate change.

8. The programme is now delivered by a team of 20 based in Oxford with an annual budget of around £1 million. The present contract is due to end in March 2011 with the next contract being the subject of an ITT to be issued in mid-2010.

9. The following are the main stakeholders with whom UKCIP seeks to build adaptive capacity: Central Government; Devolved Administrations; Regional Governance and Regional Climate Change Impacts Partnerships; Local Governance; Private Sector; Research Community.

10. UKCIP's achievements are largely based upon the development of a set of "tools" which support the UKCIP adaptation methodology. These include: the Risk Framework, the Adaptation Wizard, the Local Climate Impacts Profile (LCLIP), the Business Areas Climate Impacts Assessment Tool (BACLIAT); Costing Tool; Socio-economic Scenarios; etc.

UKCIP RELATIONSHIP TO DEFRA ET AL

11. UKCIP has always worked closely with Defra on adaptation issues. At the outset, UKCIP was answerable to just one or two Defra officers and this continued roughly until the end of 2007. Since its creation Defra's Adapting to Climate Change (ACC) team has quickly grown to its present complement of around 40. This is a powerful response by central government to increasing concerns for climate impacts but it has inevitably changed the relationship between UKCIP and Defra. Both parties are still exploring how to optimise this relationship. It is important that in this new relationship UKCIP is encouraged to retain its distinctiveness to complement this enhanced activity within government building on each others' strengths and expertise.

12. Important relationships also exist with other central agencies, for example English Nature and the Environment Agency. These agencies have increased their adaptation capacity and will be a vehicle for further partnership working in the future.

CENTRAL GOVERNMENT

13. UKCIP guidance makes an important distinction between (a) Building Adaptive Capacity and (b) Delivering Adaptation Actions. For Government Departments, Building Adaptive Capacity will be the more typical response. This will involve a wide range of initiatives including: surveys, research, impacts assessment, institutional review, policy review and development, training, adaptation options assessments, resource allocation, institutional change, etc. It is not clear that all Government Departments have appreciated the scope of such capacity building and particularly the necessary timescale and resources required.

14. This understanding may help departments to differentiate between two types of short-term priority/one involving the immediate defence of vulnerable systems, the other beginning the longer-term capacity building process outlined above.

15. Defra ACC has responded swiftly to the various requirements flowing from the Climate Change Act. The NAO review provides a quantitative understanding of progress on adaptation within OGDs which indicates that some Departments have begun to consider their resilience. This is to be welcomed.

16. The approach that has been adopted across whole Departments may not penetrate sufficiently into the individual divisions, agencies, etc. Our experience with all types of organisation has been that the vulnerability to a changing climate is very specific/specific to locality and specific to activity. A high-level review at departmental level will typically yield only generic risks. A more detailed assessment further down the organisation will yield a richer understanding that will invite consideration of practical adaptation responses. This will be the next stage for many Departments.

17. Government statements promote the idea of “unavoidable climate change”. This recognises that the climate through to the 2040s is already determined by emissions made last century. This is a helpful concept as it promotes understanding of adaptation, but we have found that it does not invite serious consideration of the longer-term commitment to a changing climate that we will experience in the latter part of the century when the changes and impacts will be greater. It may help Departments initially to consider three broad timescales: current vulnerability; vulnerability to the 2040s; vulnerability beyond 2040 to 2100. This will not be a one-off exercise and such vulnerabilities must be the subject of further systematic review.

18. In addressing climate change there is general support for the integration of “mitigation” and “adaptation” agendas, particularly within central Government. UKCIP experience suggests that whilst this joined-up approach might appear intellectually sound, and remains a longer-term ambition, in practice it is not always helpful. It is still the case that generally, where the two climate change themes co-exist, the “adaptation” component is marginalised. So, for example, the creation of DECC might have been seized as an opportunity to bring the two agendas together. In practice, at that time, the adaptation agenda might well have been marginalised, particularly given DECC’s short-term mitigation priorities. It may be the case that adaptation is now sufficiently mature to co-exist with mitigation but this still needs careful consideration.

THE DEVOLVED ADMINISTRATIONS

19. It appears that the prevailing culture of the wider political relationships between Westminster and the Devolved Administrations is limiting the potential for co-operation on adaptation work. Adaptation is a new topic for many, so, alternative approaches provide us with real opportunities for experiment, comparison and shared understanding. Such opportunities exist in the adaptation work of the Devolved Administrations both between the three DAs themselves and in both directions between the UK Government and the DAs. UKCIP is being encouraged by Defra and the DAs to ensure that tools are developed which are applicable in all settings and that examples of current practice are widely drawn. There is further scope here for co-operation at Government level to exploit the different adaptation experiences derived from the four different administrations.

REGIONAL GOVERNANCE AND REGIONAL CLIMATE CHANGE IMPACTS PARTNERSHIPS

20. Because the climate and weather act locally, and therefore have local consequences, UKCIP has recognised the importance of work at a regional scale. It was instrumental in setting up Regional Climate Change Partnerships which now flourish in all English Regions and in two of the three DAs. Defra ACC has recognised the potential of these organisations and provided useful funds which have enabled enhanced co-ordinating/secretariat functions and some impressive stakeholder-led regional projects.

21. These partnerships will benefit from continued and increased support as they have created and sustain powerful networks of agencies in public and private sectors that are committed to dealing with resilience to a changing climate at a regional scale. The outputs from these partnerships are increasingly valuable. The partnerships are now co-operating, badged as Climate UK, to share their increasing understanding and work jointly on some projects.

22. The work of these partnerships is particularly important as the arrangements for formal regional governance in England are still very tentative and subject to radical change or removal. There is no evidence to suggest that Defra ACC will continue to fund the partnerships.

LOCAL GOVERNMENT

23. Local authorities are regarded by many as the key delivery agents of adaptation. This reflects the fact that weather acts locally, that critical services, many of which are vulnerable to climate change, are delivered by local authorities and that local authorities have overall, statutory responsibility (with their LSP partners) for the well-being of local communities.

24. Initially the main driver for climate change work in local authorities was the Nottingham Declaration Partnership. Since 2006, the declaration has embraced adaptation as well as mitigation, UKCIP was an active partner, and the Nottingham Declaration website provided extensive guidance.

25. Since then the new Performance Framework has proved to be a greater influence through the National Indicator NI188 (Planning to Adapt to Climate Change). The use of a “process-based” indicator has been particularly effective. Despite some high-level opposition Defra succeeded in securing this approach. Feedback on NI188 has been very positive. It is strongly recommended that a similar “process-based” approach is adopted for the next round of the Performance Framework.

26. UKCIP has been an important part of the delivery team in a support programme for local authorities which is planned to continue to the end of the CSR. This has been delivered, in part, through a series of regional workshops, initially structured around the sequence of levels in NI188. This has provided the opportunity to appreciate the challenges faced by local authorities across the country and the various responses made. In general we have been impressed by the significant level of engagement amongst councils, particularly those that have signed up for NI188 as part of their Local Area Agreement.

27. Nevertheless, we have found that councils, particularly District Councils, have identified a serious lack of resources (ie staff) in taking forward this agenda. In some cases this has been resolved through partnership and co-operation between neighbouring authorities. This approach is to be commended and encouraged.

28. In terms of the support available to councils, officers have made critical comparisons with the level and quality of support provided by the Carbon Trust and Energy Saving Trust for local authority work on mitigation. UKCIP has been asked to make representations for similar levels of support for adaptation.

THE PRIVATE SECTOR

29. The relationship between Government and business is notoriously challenging, particularly in identifying how commercial drivers can be identified in new policy areas. Adaptation is no different. So, UKCIP has developed messages that distance the adaptation agenda from the mitigation agenda and has worked with concepts such as: business risks; business continuity; market threats and opportunities. Even so, engagement of the private sector has been slow, with a few exceptions (eg water companies and insurance) and UKCIP’s networks with individual businesses were characterised as limited to an “alliance of the willing”!

30. This culture has changed, even in the last 18 months, and we are now approached for guidance by individual businesses. These have tended to be the larger companies, often with a global reach, and include several large multi-disciplinary consultancies working on the built environment.

31. Nevertheless our main work has been with business-facing organisations. This has included:

- a series of programmes with professional institutions and trade associations (under the banner of “A Changing Climate for Business”);
- working on sectoral projects with selected RDAs;
- working with the CBI Adaptation Working Group on a new adaptation publication to be launched in Spring 2010;
- working with SMEs through business support organisations such as Business Link, the Federation of Small Businesses; and
- working with the Institute of Environmental Management and Assessment (IEMA) including an extensive CPD programme and a joint publication on adaptation in IEMA’s Practitioner Guide series.

32. The work with individual businesses has largely been structured around the UKCIP Adaptation Wizard and associated tools. Further tools are under development based upon the increasing experience of working with individual companies.

33. Defra ACC now includes a small team dedicated to working with business. The ACC work programme has been developed alongside that of UKCIP that maximise the potential of each team with complementary roles—ACC using its leverage and influence at a policy level and UKCIP working on a 1-to-1 basis with individual companies.

34. UKCIP and ACC are working together with the British Standards Institute (BSI) to prepare an adaptation supplement to accompany existing business standards (such as ISO9000 and ISO14000).

35. As part of the wider programme with OGDs, ACC will be working with the Department for Business, Innovation and Skills (BIS) to develop and implement appropriate business policies.

THIRD SECTOR

36. The third sector has just begun to consider adaptation and we are aware of some recent initiatives in this area. These include: a major research programme funded by the Joseph Rowntree Foundation (Social Implications of Climate Change); a set of four practical projects co-ordinated by the Baring Foundation; and a taskforce jointly chaired by Defra, Department of Energy and Climate Change and Cabinet Office ministers and third sector representatives. The taskforce aims to identify specific actions that Government and the third sector can take together to tackle climate change, environmental problems and sustainable

development more broadly. The Department for Communities and Local Government will also be represented on the taskforce. The secretariat for the taskforce is being provided by Green Alliance and the National Council for Voluntary Organisations (NCVO).

UK CLIMATE PROJECTIONS (UKCP09)

37. The release of the latest climate projections for the UK in the 21st century (UKCP09) has proved to be a major catalyst for engaging stakeholders with the adaptation agenda as well as providing a powerful technical resource for risk-based decision-making. There are though several concerns with the new data set.

38. The projections do not provide us with direct information on the impacts and consequences of changing weather. They only suggest how the weather might behave and much work remains to be done in order to understand impacts and consequences, and then to explore adaptation options.

39. The probabilistic format will in due course facilitate sophisticated risk-based decision-making. However, the format presents considerable complexity for mainstream stakeholders. It may take several years for the adaptation community and general policy-makers to agree on how best to use this considerable resource.

40. In particular it is important that expectations are managed and that some significant policy implications are investigated and resolved. Government departments do not appear to have recognised the challenge of incorporating the probabilistic data into policy and guidance. (For example DCLG responsibilities on such as Building Regulations and Planning Policy Statements.)

41. The interface between the projections and policy needs serious attention in many departments. Understanding in this area is desirable before the brief for a further set of climate projections is confirmed.

42. The evidence from climate-science, and from international agreements on emissions, suggests the increasing possibility of higher levels of emissions than represented in the UKCP09 projections. We are being asked to provide projections based upon these higher emissions, using the same format as UKCP09, in order that stakeholders can understand the UK impacts of higher global temperatures.

THE FUTURE OF ADAPTATION IN THE UK

43. UK is in advance of other developed countries in its progress on adaptation.

44. It has probably not yet built sufficient public or general understanding and appreciation of the need for adaptation, but this is a slow process and some progress is being made.

45. There has been significant progress in some areas in raising the profile of adaptation—work with local authorities, the latest set of projections, the national risk assessment, and UKCIP tools and resources are good examples.

46. Adaptation work in Government Departments needs to include more “bottom-up” understanding to complement the initial “top-down” approach.

47. It is important that that the distinctive characteristics and achievements of the previous UKCIP programme are recognised in defining its future programme and that appropriate resources are committed to this cause.

10 November 2009

Witness: Dr Chris West, Director, UK Climate Impacts Programme, gave evidence.

Q43 Chairman: Good morning and welcome to the Committee. Thank you very much for coming in. You have heard what has been said so far, including the fact that we are working to a strict timetable. For a long time the UKCIP was the main government-funded body working on adaptation. We now have a new framework in place for adaptation and Defra has a bigger role. How does that leave you? How do you fit into this new landscape?

Dr West: We always worked at the bottom-up level with stakeholders, with people who really needed to adapt, and we regretted the absence of the top-down imposition of the requirement to adapt. That has now been addressed with the Government’s programme. It has made a number of changes to our relationship with our funding department, with Defra; some good, some bad. When we heard about the move of climate change, with the exception of

domestic adaptation, across to the new Department of Energy and Climate Change, we were disappointed and said this is splitting up climate change, but actually everywhere where mitigation and adaptation have been considered together, adaptation has always ended up the poor relation and marginalised, so the situation we have within Defra is that it is a very high priority, so in practical terms that is a real advantage. The only cost is that we are more disconnected from that interesting international adaptation agenda, but we have ways of addressing that.

Q44 Chairman: That is interesting. We are conscious as a Committee, having focused on climate change issues for the last four years or so, that this is our first inquiry dedicated specifically and solely to adaptation, so it rather bears out what you have just

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said. During the lifetime of the UKCIP the scientific evidence has got stronger about the scale and the urgency of the problem. Are you able to react quickly in the light of that evidence about the perhaps slightly changing and growing threat and therefore the need for a bigger and more urgent adaptation programme?

Dr West: I think we have. We have known what evidence is coming along in terms of climate itself. I think we have been able to keep ahead of that. Certainly when the programme started when I joined it seven years ago we spent a lot of time persuading people that this was a real issue, that climate was really changing. Two years ago we made an executive decision that we would not do that ever again. If somebody wanted to talk about whether the climate is changing we would say, "We will talk about it in the pub afterwards. We are meeting here to do something about it," and we have had no negative reaction from that decision. In terms of the increasing level of prospective climate change, we are able to deal with that because we have always talked in terms of an adaptive approach. You do not, if you like, adapt to one future; you have to adapt to a range of futures. If that range extends you are still in the same situation.

Q45 Chairman: And this new organisational structure does not inhibit continuing to do that?

Dr West: I do not think so. I think it highlights an issue that is important, that dealing with climate change in terms of adaptation does require both the bottom-up approach and the top-down approach. The focus at the moment is very much on the top-down, requirements of the Act and things like that, and it is easy to forget perhaps that a lot of that is only working because of a lot of work beneath the surface, if you like, ten years or so of UKCIP engaging people and persuading them that this is a real issue and that they ought to start thinking about it for their own purposes. One of the reactions we always got was, "When the Government says we have got to do it, we will do it." That was a very common response from local authorities. I think that bottom-up approach has prepared the ground for the current top-down work. However, that bottom-up detailed technical end of it is still important and I think that is where our role will continue to be.

Q46 Joan Walley: Let us look at that role a little more and let us look at the role of local authorities. If you look at mitigation we have had the Carbon Trust and we have had the Energy Saving Trust and that has had funds come down from government who have provided that bottom-up work. What similar level of support is required for adaptation? Where are those resources and how is this work by local authorities going to be funded?

Dr West: That resource has never come out of government and maybe will never come out of government.

Q47 Joan Walley: Should it?

Dr West: Possibly. I will come back and answer that directly in a moment. The feature of adaptation that we have always used because there is not that big resource is "you will adapt for your own reasons", and local authorities are a nice example of organisations that have a duty of care and they recognise that duty of care for the well-being of the community. That has been our way into local authority taking action on adaptation. They are doing it because they can do that job of looking after the community better by adapting. We have always said yes, this is a necessary extra task but in the long run we believe it will save you time and effort.

Q48 Joan Walley: But just supposing that there was some equivalent of the Carbon Trust, say, to help local authorities to exercise their duty of care. Do you think there is the resource capacity inside local authorities as things stand at the moment to take advantage even if there were that external support or if it was not just coming from a new body that was set up, say from what was already there in departmental spending budgets?

Dr West: Just cash going straight to local authorities would not do it. I think there is a knowledge gap that could be addressed by funding something like ourselves magnified many times and we could engage with every local authority. At the moment we engage with, if you like, those willing to learn about the process and we can pass that on.

Q49 Joan Walley: Is that not the problem that you might have a local authority that is willing and has the capacity but you might get some areas of the country where there is not even an understanding or an acknowledgement of it? Who is going to do that training or where is that going to come from?

Dr West: We can do a small part of it but we cannot do all of it. It has to be driven from those local authorities and some of them are way behind others.

Q50 Mr Caton: You have mentioned that you welcome the new structure in providing a top-down element to complement the work you are already doing bottom-up, but in your written memorandum to us you argue that government departments themselves need to develop a more bottom-up understanding of climate change risks. What sort of steps should large government departments be taking to develop that understanding and what sort of support do they need to provide?

Dr West: I think government departments, civil servants in general and the policy people who tend to pick up this agenda work naturally top-down. They think in generalities, they think in terms of their own policy area perhaps. What we would advise and, where possible, we have advised this, is actually to get down to the coal face where people are solving day-to-day problems because one of the things that is becoming very clear is that we are not talking about an issue that will happen in the future. We have had decades of climate change and we now have what we would call an "adaptation deficit" and drilling down to the operational level to understand

how people are now dealing with that adaptation deficit, what things they are facing, how they are solving those issues, is an important part of the richness, if you like, of the risk assessment that government departments are now required to do. I do not believe you can do it top-down. You have to engage, if you like, the people with boots on and ask them what they are experiencing now.

Q51 Dr Turner: You note in your own evidence that Stern set out a very basic principle which most of us recognise in theory which is that investment now yields benefits in due course. You say that that principle is now recognised but somewhat in the abeyance because not a lot of it is actually happening in terms of resource allocations in government. Why do you think this has happened? What do you think is not happening and what do you think are the barriers?

Dr West: There are a number of barriers. You were asking earlier in this session about the Treasury Green Book, which goes some way towards valuing the whole life of a project or an activity. I think they are not going as far as perhaps our Victorian forebears did in investing for a long period in the future. We are required to be much more efficient these days. People are required to show that money is being wisely spent, and if that means you design something for 30 years in the expectation that its value will be zero after that time and you will build something else, then everything is built for today's climate. Where we have engaged people and a lot of effort is to ask, "Is there another way round?" It is always that investment for the far future is the first thing to be cut off any project. People start off with the best of intentions and then somebody says, "We can save 5% if you do not do that," and they have to do it. I think that Treasury lead is still not strong enough to invest for the far future.

Q52 Dr Turner: So you are saying that short-term priorities will always squeeze out investment in long-term projects?

Dr West: It appears so.

Q53 Dr Turner: That is a little sad, is it not? Have you any levers in your climate change team with which you can attempt to influence resourcing decisions?

Dr West: Yes. Not in terms of finance, I think, but in terms of reputation we can say, "Do you really want to be in a situation where people will look back on your decisions and say 'how short sighted?'" Sometimes that is effective. Sometimes it is the immediate reputational benefit of saying we have sorted this out for 50 years, we are happy that whatever it is is proofed against the worst that climate can throw at it, but it is persuasion, it is a small carrot, it is not a stick.

Q54 Colin Challen: How do businesses respond to the adaptation agenda? Are they prepared for it? Are they really aware? Is it big companies that are maybe doing things or SMEs as well? What is happening on that front?

Dr West: Again this short-termism is a problem but there are companies who recognise there is reputational value in addressing this issue. There is increasing anecdotal evidence that investors recognise that a company that is addressing climate risks adequately might also be addressing other risks rather better than the average, so that is beginning to be applied. In terms of size of company, the very smallest have real trouble dealing with this. You can talk to them about the very near term, risks they are facing right now, and they can do a few things about that. Sometimes the middle-sized companies will pick this up and say, yes, here is something we can make a profit from or we can avoid real losses. The very big companies, multi-nationals, believe they have got it all sorted, and indeed they may have. It is very hard for us to find out about that level of company. They tend to say we have got very good risk management processes, we have covered this. I have had one or two instances where they have missed the notion entirely. A big multi-national chemical company reduced their emissions of solvents, which was hugely trumpeted in their corporate sustainability report, but they had missed the point that most of their plants around the world were sited in flood plains and they had not recognised the link from corporate social responsibility to the possibility that the environment through climate change might have an impact on their profitability.

Q55 Colin Challen: Following on from that, who might actually be studying or auditing the resilience of major plants in this country, which is important to our economy? It might be in private hands but nevertheless it is part of our critical infrastructure.

Dr West: There is a private sector, I guess you would call it, initiative of business continuity, which for companies above a certain size it is effective because they can address it, they can see the reason for it, and issues like flooding are well covered by it. I think a lot of them do not see it in terms of climate change and indeed when I have talked to companies about this, they say, "No, it is much more important to worry about the present than the future." If I then come back and say, "I am talking about the present, you may be running risks right now," they do not see them as climate change related. They say, "It is always like this. This is part of what we do every day."

Q56 Colin Challen: Who is taking the lead for this? Who is helping businesses understand the issues? In mitigation terms we have the Carbon Trust of course. A lot of people understand what a carbon footprint is but on adaptation I am not really clear in my mind who takes the lead on this kind of thing and helps businesses adjust.

Dr West: All right, I think if we look just for comparison to the local authorities, they now have a very strong requirement in National Indicator 188. They have to adapt and they have to report on how they are doing it. For the business sector, there is a lot of pressures each of which is very small and none

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is in the lead, so we can engage some people, that business continuity agenda engages others. Investors, especially the ethical investors, local authority pension funds, university pension funds, things like that, are interested in the power they might have to put pressure on companies but they are not yet doing it.

Q57 Colin Challen: Is it not an obvious job for the RDAs⁶ perhaps?

Dr West: Some of them are picking it up. Some of them have got other things that occupy the front of their minds. There is a whole range of possible pressure points. None of them are really very effective at the moment. We have talked to trade associations picking the ones really that had a history of providing services to their members. We are now talking to the British Standards Institute to see if we can put an adaptation annex on to the ISO 14001 and the other ones. The Department for Business, Innovation and Skills are interested but they have a tradition of not legislating. The business sector is difficult because there is a whole raft of small carrots rather than any one big one.

Q58 Colin Challen: Is that because they are lobbying against any intervention and saying they will just take care of it themselves and that self-regulation is always best? That is what they always say.

Dr West: They always have said that. Certainly the CBI is now looking at adaptation. They have an adaptation working group but that will be in terms of providing guidance rather than asking government to legislate, I am sure.

Q59 Dr Turner: Are we going to need more people working in adaptation? Have we got enough people with the right skills to respond to the agenda?

Dr West: Yes, we do need more people. No, we have not got the skills. We have not got the skills in the general population to understand climate risks and therefore a whole area of pressure on government and on utilities to adapt is not there. The public are not requiring this. Everything the Government has done on adaptation has been done without reference to the electorate and I think that is an education issue. Within local authorities, again, the planning process is much more about drawing lines on maps than thinking about risk. I think that is an educational issue. I could talk about schools. I would rather talk about professional training where we are talking to a number of organisations. The Institute of Environmental Management and Assessment are interested in providing professional training for their people. We would like to access some of the local authority specialists, so the planners and the risk managers, but I think there is a big area of—it is not ignorance but it is a way of looking at things slightly differently from the way we do now.

Q60 Dr Turner: The Civil Service has a traditional career development pathway by which people are shuffled around from department to department. Is this compatible with establishing a long-lasting adaptive capability?

Dr West: It makes it harder.

Q61 Dr Turner: Do Defra and other departments have enough people with good understanding of adaptation in positions where they can influence decision-making?

Dr West: I do not think so. I think they are getting there. They have brought in a raft of very smart people who are picking it up. However, despite the number of training days that we have run, the number of people who should be knowledgeable about adaptation but are not is growing.

Q62 Dr Turner: One of the other problems in planning for adaptation is the wide range of probabilities incorporated in climate change scenarios. There is a 50% chance of getting down to two degrees if we do what the Climate Change Committee says but 50% is a pretty big margin of error. What are the implications of this extreme range of probabilities for the robustness of adaptive planning processes?

Dr West: Too big effects. First of all it makes the whole process of looking at the future very much more daunting. It would be nice to be able to say, “This is what the future is going to be”, but we are not in that position now and it may well be we do not get any closer to that position. This knowledge of the uncertainty is in fact a disincentive because people say, “Unless you can tell us the future, we cannot adapt to it.” I think we can but we have to acknowledge that it is very much more difficult than that simple model would suggest, so we are saying you have to look at this range of futures. You have to look at your own operation and examine your own attitude to risk and then you may be able to look sensibly at this wide range of possible futures and say, “Yes, we can cope with all of these. Up at this extreme end we cannot cope at present and we may have to do something different, but how important is it to us that we do not fail at that extreme?” It does put this extra burden on people to think not only about the climate but about their own operations.

Q63 Dr Turner: Do you see a role for the Met Office in addressing this issue, helping you?

Dr West: The Met Office will do their best to reduce that uncertainty and to describe it, and we can work with the Met Office in helping people understand that description, but, as we learn more about how the climate system itself operates, it is wishful thinking to think that we will reduce the uncertainty about future climate. It may well be that this extra knowledge will actually increase the uncertainty. We are vociferous in saying to people, “Do not sit around waiting for a more exact description of the future; it is not going to happen. You have got to get on and deal with these multiple futures right now.”

⁶ Regional Development Agencies

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Q64 Dr Turner: Are you keeping up-to-date with publishing predictions?

Dr West: Yes, I think we are. I do not like the word “prediction”; I would rather say “projection” because it brings to the fore all the assumptions that lie behind there.

Q65 Dr Turner: I meant projection; I do apologise.

Dr West: I think what we have in the 2009 projections is the best science in the world right now. There are other groups in Australia and the US who are following different paths towards the same thing—a description of that modelling uncertainty. What I think we have in the UK is a very high quality, future proof methodology. It is hard to understand. I fail to understand it myself. You need to understand Monte Carlo modelling and the difference between emulation and simulation. It is complex but we have had an international peer review that said this methodology is robust.

Q66 Chairman: Do you think that the reliability of those projections is important in influencing the doubters? You said earlier on you have given up arguing with doubters, and I know exactly how you feel about that, but nevertheless one way in which doubters may be convinced is if projections are made and they come about, and indeed that is why, sadly, some of the very severe weather recently has been perhaps in some ways helpful in addressing that group of people. The preparation for adaptation and then the confirmation that those preparations were needed may be quite important in getting people to accept tougher mitigation measures. Would you accept that?

Dr West: Yes, I think as a thesis that works. In practice, I think we have to recognise that the adaptation agenda has reached the broadsheet-reading professional decision-makers quite well. The majority of the rest of the population do not believe this is a real issue so why would they worry about adaptation? Increasingly, we have very good evidence of the recent past of places, times, incidents where actually we cannot say that a civilised Western European country has managed its climate adequately. I think that evidence base is very important. It is often not recognised as part of the projections, but the first bit we published was that current climatology.

Q67 Joan Walley: In response to that you are a scientist and you have got evidence-based projections. What do you say to the climate change deniers?

Dr West: I say look at the recent past, look at what has happened and then use the precautionary principle and just address the possibility that this might be a real occurrence. Again, for professional decision-makers that makes sense. If there is a possibility that this is happening, you must deal with it. As the evidence for this being real increases then the argument for dealing with it increases as well.

Q68 Chairman: You are probably right that this is still an issue which is more for the broadsheets than a wider public. Those of us who have taken a close interest in this, in my case since the middle of 1993, can take some satisfaction from the fact that it was not even anywhere near the broadsheets 16 years ago, so very considerable progress has been made.

Dr West: Yes.

Chairman: Thank you very much for coming in. It was very helpful.

Supplementary memorandum submitted by the UK Climate Impacts Programme (UKCIP)

1. *Is the new organisational framework, put in place by DEFRA over the last two years, coherent and likely to lead to efficient promotion and oversight of adaptation?*

1.1 If we consider the new organisational framework to include the Adaptation Sub-Committee (ASC), the adaptation components of the Climate Change Act (reporting Powers, Risk Assessment, etc), the Departmental Adaptation Plans, the ACC team, as well as other agencies such as EA, EN, UKCIP, etc, then this framework has yet to be fully tested. However, when compared with two years ago it represents a major step forward in Defra’s ambition for a well-adapting UK.

1.2 This question is one that should probably form part of the regular monitoring to be provided by the Adaptation Sub-Committee (ASC).

1.3 As is usual with central government initiatives the approach is very much “top-down” and there are no obvious mechanisms to ensure “bottom-up” input, either conceptually or operationally. We believe that this is particularly important in this area of work.

1.4 International adaptation work is not well coordinated. General processes are in between Defra, DECC, FCO, DFID but these remain untested. There is some expectation that this might improve post-Copenhagen, so we must wait and see.

1.5 Work with the Devolved Administrations has been very partial but there are recent signs of greater co-operation. There exists a real opportunity for learning, experiment, etc, based upon different approaches to be adopted by the different administrations but this needs to be recognised and formalised as an observational (not an interventionist) project.

1.6 UKCIP has adopted the “region” as an appropriate spatial and governance scale at which to work on adaptation. But there is still relative confusion surrounding the new arrangements for regional governance, which makes for difficulties in delivering regional policies, programmes and plans. The informal structures of regional climate change impacts partnerships have been very effective and very resource efficient but have not been given much succour.

2. *What are the respective merits of providing adaptation advice through (i) a specialist adaptation body and (ii) a general business support organisation, such as the network of Business Links? Could good use be made of climate change aware businesses to mentor SMEs?*

2.1 The adaptation agenda is still new to most organisations. At the simplest level it will not have featured in the education or training of current managers, strategic decision-makers, etc. So, whilst it seems sensible to make use of existing support organisations (such as Business Link in the private sector or IDeA in the public sector), in practice, such organizations do not have the necessary adaptation expertise. So, at the present stage of development of adaptation, a specialist adaptation body seems essential.

2.2 This does not deny the importance of specialist adaptation bodies working closely with the general support organisations. For example, UKCIP is striving for a balance between adaptation expertise and good business-influencing skills. With, for example, Trade Associations and professional bodies; existing government business facing organisations; local chambers of commerce; business continuity sector; consultancies.

2.3 Crucial to such work is the UKCIP principle that knowledge transfer takes place in two directions: specialist adaptation bodies transfer their understanding of future weather and climate but also gather new understanding of how a business, local authority, or sector responds.

2.4 Advice and support needs to be supplemented by regulatory, contextual, or market sticks and carrots

2.5 Mentoring of SMEs is untried but there is potential power in requiring adaptation of the supply chain (for example, Co-op requires ethical behaviour down its supply chain—Government and “good” businesses should chase climate resilience up and down their supply chains (Note that the delivery chain may be more important than supply, because of higher added value of goods, and the fact that they may be “branded”).

3. *UKCIP’s memorandum to this inquiry says that the probabilistic format of the 2009 UK Climate Projections presents considerable complexity for mainstream users. What are the implications for the robustness and cost of adaptive actions if users do not understand the projections?*

3.1 There is clearly scope for poor decision-making if users do not understand some of the subtleties of the latest projections. But this question needs to be answered in the recognition that there is a multiplicity of different types of user—or perhaps, more important, non-users. So, the needs of sophisticated users continue to drive the further development of the projections and help to improve functionality. For decision-makers that are not yet engaged we must continue to explore ways in which they can be introduced to the wider processes of adaptation (see responses to Q4 and 5.6 below).

3.2 Some of the possible results of misuse might include:

3.2.1 Users may waste resources pinning down a better description of future climate (interesting and cheap but not useful) instead of building in resilience (much harder and possibly incurring real costs).

3.2.2 Discouragement and abandonment of the adaptation process, missing specific opportunities to adapt (including synergies), and maintaining or enhancing vulnerabilities.

3.2.3 Maladaptation because of a common misperception that the most likely future climate described now is the only possible climate at some future point.

3.2.4 Users identify “brittle” adaptation strategies or measures (based on a preferred or single future climate rather than more robust strategies or measures).

3.2.5 Instead of building in resilience they are more likely to be creating strategies/measures which may be increasing vulnerability, maladaptive and less robust (much more brittle) with real costs associated. If the future climate does not occur, the adaptation strategies/measures may need to be adjusted (concerns regarding over- and under-adaptation).

3.3 Users have noted the complexity of using UKCP09, but also many are able to see the opportunities afforded by the probabilistic projections. To address this complexity, UKCP09 offers and will continue to develop information at different, simpler levels and in different formats (eg, maps, graphs, key findings, storylines). In addition, UKCIP is working with users towards developing guidance and case studies to illustrate how to use this less complex information to support risk and adaptation assessments.

3.4 UKCP09 also includes more information on the current and recent past climate that allows users to better understand their current climate risks and vulnerability, as a prelude to considering their future vulnerability.

3.5 UKCIP is keen to underline that users should follow an “adaptation pathway”, in which only the first few steps are fixed now, but which will develop and change as climate unfolds, as knowledge accumulates, and context changes.

4. *Given UKCIP’s existing resources, what more could UKCIP do to assist organisations to make good use of the projections? What could UKCIP do if it had additional resources?*

4.1 The question implies that the latest projections are the main vehicle for working with stakeholders. The release of UKCP09 has proved to be an excellent catalyst and a powerful means of stakeholder engagement. Nevertheless, UKCIP has recognised that the projections only represent a small part of the information required for the wider decision-making process.

4.2 Within existing resources we have responded to feedback from a fairly small number of stakeholders (see 3 above). However, we have not had sufficient resource to engage a wider community of stakeholders (ie the ones who aren’t yet using UKCP09 but probably should be) to find out how we can get them engaged.

4.3 With additional resources, we could put more effort into introducing the wider decision-making framework, of which the projections form only a part. This approach can probably be best captured by thinking of “Building Adaptive Capacity”. For most organisations this is a necessary pre-cursor to “Delivering Adaptation Actions”.

4.4 Considerable resource has been spent on producing and publicising the projections. The immediate beneficiaries have been specialist decision-makers, many of whom are already fully engaged with the agenda. The next challenge is to engage the thousands of generalist decision-makers. This will build upon the existence of UKCP09 but concentrate upon “Building Adaptive Capacity”.

5. *In key policy areas, such as planning, should departments be providing local authorities and other local public bodies with advice on how to apply the projections?*

5.1 Yes! The application of probabilistic projections requires knowledge of the adapting body’s attitude to risk. Only then can the probabilistic format of the data be exploited.

5.2 Advice itself must be offered with care—we have already encountered public bodies considering the use of the “central estimate” as a blanket policy. This may be convenient for those providing the advice, but fails to understand or exploit the potential of probabilistic data, or to quantify the concept of risk.

5.3 There is a raft of “political numbers” that need to be used, even if they are not made public. For example the heat-wave plan lacks a political statement about the acceptable death rate for old people in a heat wave, or about the acceptable level of risk of such deaths. This means that adapters at many levels cannot determine how much adaptation is required. Effectively, without a “value” for such a death, it is impossible to allocate the “correct” amount of resource that should be put into avoiding such deaths.

5.4 Some of these “political numbers” can be expressed as “technical numbers” for action. Defra Flood Management has used a rule that defending against a level of river flow 20% greater than “normal” is necessary. Railway track is laid under sufficient tension that the societal costs of the weather pulling or pushing rails out of alignment is minimised. Underlying that calculation are assumptions about the acceptability of disruption or accidents.

5.5 Planning approval for development is dependent on Environment Agency “technical numbers” for flood risk. Underlying these numbers is a political view of the absolute and relative acceptability of flooding of houses, schools, sheltered accommodation etc. So, who will advise which of the probabilities to use in providing advice on a particular development site? What criteria should they use in making this judgement?

5.6 This concept of political acceptability needs to be linked to the use of UKCP09 and applied to national, local, and sectoral decision-making, in which case more training of politicians and strategic and technical decision-makers will be required. We see no evidence of this at present. Perhaps this is another task for oversight by ASC as an extension to the CCRA exercise.

6. *What improvements would users like to see in the UK Climate Projections, such as increased resolution or information on the consequences of the changing climate? What improvements are likely to be made to the Projections and by when?*

6.1 Users seek assurance that there will not be a new set of projections for some time. They want an opportunity to use and explore the utility of the projections before any further changes are made in the data or its format. They recognise that the present data are complex but hold advantages. They wish to ensure that their investments in understanding and using the projections will not be lost.

6.2 An update (November 2009) added some of the most urgent requirements, including the promised threshold detector and more of the marine and coastal projections and further information on the observed data and increased accessibility. Based on the feedback received from users, additional enhancements and increased functionality are planned with release likely in April 2010.

6.3 We are working with the user community to better identify the more urgent enhancements and increases in functionality. This is being done through: one-to-one contacts with users and their case studies; working with communities of users (targeting those using the projections, the weather generator and the marine projections); and working through the Users' Advisory Panel.

6.4 We have an operational helpdesk which responds to users' enquiries and has resulted in additional functionality, and information being added to the guidance and support.

6.5 One additional area of work will be the development of storylines based on impacts and risks of concern. These are needed to better understand the consequences of a changing climate and will start with the current risks and consequences and then point to the projected changes of climate.

6.6 There is now a higher priority for information on the impacts and consequences of changing weather and climate. Experience elsewhere suggests that that information on consequences of climate changes should not be developed or provided to users as part of the climate projections. These should be developed in partnership with stakeholders so that: the stakeholders own the information on consequences; the evidence can be based on real experience, locally derived; and they use their own value judgment to determine what is a significant local consequence. This should be based on a new programme of stakeholder-led research into impacts and consequences.

17 January 2010

Tuesday 8 December 2009

Members present

Mr Tim Yeo, in the Chair

Colin Challen
Martin Horwood

Mark Lazarowicz

Memorandum submitted by the Local Government Information Unit (LGiU)

INTRODUCTION

1. The Local Government Information Unit (LGiU) is an authoritative and informed source of comment, information and analysis on a range of local government and public policy issues. It has provided support to councils and championed local democracy for 25 years. Our 150-strong local authority membership includes Labour, Conservative and Liberal Democrat councils. The LGiU shares its expertise with government and campaigns to extend local authority best practice, freedoms and responsibilities. Our teams of policy analysts provide policy advice, training, consultancy, public affairs services and other resources to our members and other organisations. The LGiU was awarded Think-tank of the Year 2008 by Public Affairs News.

2. The LGiU welcomes the inquiry on adapting to climate change. We believe adaptation is fundamentally a local issue with local authorities taking a central role in grappling with the complex impacts of climate change—risks and opportunities—and setting in motion plans to build the resilience of their services and communities.

3. This submission is supported by the ideas and expertise from our work with the Local Government Flood Forum, the Local and Regional Adaptation Partnership and our policy development work for councils. We also specifically convened a roundtable of elected members to discuss adaptation and conducted a survey of 53 local authorities.

SUMMARY

4. In response to the consultation request the LGiU has two main points:

- (i) Local authorities across the UK have little idea of the work of the Adapting to Climate Change Programme (ACC) and are poorly prepared for the challenges of adapting to climate change.
- (ii) The LGiU advocates a new framework for managing adaptation to climate change:
 - (a) A new national source of information and support for adaptation is needed. This could be coordinated by Defra, building on existing structures, or be a new organisation modelled on the Carbon Trust and Energy Saving Trust such as a “*Climate Adaptation Trust*”.
 - (b) In order to coherently manage adaptation new *Local Adaptation Management Boards* should be considered to bring the relevant stakeholders into a democratically accountable decision making body.
 - (c) A new approach is needed where organisations locally and nationally, including central government, work better together and combine risk management with economic opportunity and social justice. The LGiU calls this approach “*Positive Adaptation*”.
 - (d) Those organisations taking a positive approach to adaptation and having the resources in place to do so successfully, be recognised as “*Climate Ready*”.

CONSULTATION QUESTIONS AND RESPONSES

What is the extent to which the Adapting to Climate Change Programme will increase resilience by embedding adaptation and climate change risk assessment into the work of government departments?

5. It needs to be acknowledged that the ACC team is relatively new and has grown significantly in the last year. Nevertheless their reach beyond Defra is limited and could not be described as embedded. The LGiU works primarily with the Department for Communities and Local Government (CLG) and has found it difficult to establish contact with civil servants who recognise the importance of climate change adaptation. More often than not it is seen as Defra’s responsibility.

6. At the local level the LGiU survey showed that over 50% of the respondents knew very little or nothing at all about the UK Adapting to Climate Change Programme. Only around 7% of the respondents knew a great deal about the Programme.

7. When asked about government departments' contribution to climate change adaptation, over 50% of respondents to this question are unaware of CLG's initiatives. Of those who were aware of CLG's initiatives on adaptation, respondents mainly referred to the department's planning and renewable energy policies. The elected members' roundtable also expressed concerns about the inconsistency between Government departments on approaches to responding to climate change.

8. The ACC needs to be more accessible to local authorities. Adaptation is fundamentally a local issue with local authorities taking a central role in grappling with the complex impacts of climate change—risks and opportunities—and setting in motion plans to build the resilience of their services and communities.

9. Local authorities also need a more coherent national message on the impacts of climate change and consistency between government departments' adaptation approaches. Local authorities need the confidence that the key departments they work with such as CLG, Department of Health (DH) and Defra are communicating and working together on developing support for local authorities to implement local adaptation measures.

What is the extent to which Government departments have identified the risks from a changing climate that will stop them from meeting their objectives?

10. There are signs that government departments are becoming aware of the importance of climate change such as the DH Heatwave Plan. However, it is not at all clear that this has been translated into a realisation that they might not meet objectives.

11. As ever departmental responses rely heavily upon political leadership which has been weak so far and politically it is obvious that mitigation is the priority. To help fill this gap the LGiU is convening a learning network of Councillors to debate the local political response to climate change.

What is the suitability of the processes and structures in and across government departments for identifying, mitigating and managing these risks and determining the future priorities of central governments approach to adaptation?

12. The LGiU is involved in the Local and Regional Adaptation Partnership (LRAP), which is the body that is intended to coordinate activity across government departments and their links to the local and regional agenda. LRAP has many strengths but it is noticeable of the relevant government departments that could participate, only CLG regularly attends and other relevant departments such as Department for Business Innovation and Skills (DBIS), Department for Transport (DfT), Department for Children, Schools and Families (DCSF) and DH do not attend.

13. The LGiU would argue that all adaptation is local so it is hard to see how government departments can determine future priorities without a meaningful dialogue with the local and regional levels.

14. The elected members at the roundtable recognised that “until local authorities are actually seen themselves to be implementing initiatives and taking some real steps . . . it'll be very hard to push our constituents to do much.”

15. The Government should support this leadership role from local authorities to implement adaptation within their own councils. Local solutions to adaptation based on local needs and priorities should be promoted. The roundtable discussion highlighted that there are no “one size fits all” adaptation solutions.

How well has the overall direction for work on adaptation been set, the effectiveness of the statutory framework, the allocation of powers and duties and how well issues like social justice are addressed in adaptation policies?

16. Local government was excluded from the Reporting Power because it already reports progress on adaptation through the National Indicator 188.

17. As the statutory framework for local authorities, only 10% of survey respondents consider NI 188 to be effective in supporting them on planning to adapt to climate change. Local authorities are concerned that the climate change indicators focus too much on scores and may not be comprehensive enough to support practical implementation.

18. On a wider issue the LGiU has been arguing that local authorities do not have sufficient powers to manage the natural resources in their area and are reliant upon quangos for expertise and resources. These defined purpose quangos are less likely to be able to integrate social justice into their decision making than local authorities.

19. Consequently, local authorities should be given the powers necessary to lead on adaptation. These powers named Local Stewardship of Natural Resources (Local SONAR) would include the ability to convene all stakeholders, raise funds and measure progress.

20. Notwithstanding the above the LGiU has argued to the CLG Select Committee that in order for local government to be seen as a political institution with a strong community leadership role it needs the authority and means to act, including adequate financial resources and a reasonable degree of autonomy.

Whether short-term priorities for action including identifying and protecting key infrastructure and systems have been identified and how well these are addressed?

21. Only around 30% of survey respondents had a “great deal” or “a fair amount” of knowledge about the Government’s short term priorities for action on power, food, water and transport. Most respondents “knew little” or were “not at all aware” of action on defence and security.

22. The impacts of climate change on key infrastructure and systems such as power, food, water, transport, defence and security have direct implications for local authorities. As key service providers for the community, disruption to any of these systems will affect the services that local authorities have a duty to deliver both in the short and long term.

23. Local authorities and communities want to be confident that the Government has plans in place to protect the key infrastructure and systems that people so heavily depend on. By offering local authorities information of and involvement in the development of these actions, it can help councils better prepare and adapt their services.

FUNDING SUPPORT AND TRAINING

24. There is a lack of local government awareness on Government’s funding support and training on adaptation. The practical support is inadequate and access to them lacks coordination and publicity.

25. In broad terms there are many gaps in funding support and training. The LGiU has been calling for a new national source of information and support for adaptation. This could be coordinated by Defra, building on existing structure or be a new organisation modelled on the Carbon Trust and Energy Saving Trust such as a “Climate Adaptation Trust” (CAT).

26. The suggested functions of the CAT are:

- (a) Subsidising schemes and equipment to implement adaptation solutions in communities.
- (b) Conducting social research into community uptake of adaptation solutions.
- (c) Providing specific advice for organisations on available strategies and adaptation technologies.
- (d) Setting standards for good practice.
- (e) Disseminating good practice across communities and business.
- (f) Facilitating dialogue between business and communities about adaptation.
- (g) Carrying out applied research into new adaptation technologies.
- (h) Providing incubators and accelerating development of promising adaptation technologies.
- (i) Leveraging funding from the private sector for the development and implementation of adaptation measures.
- (j) Allowing organisations to sign up for and join a club of organisations committed to adaptation (the two degree club?)
- (k) Promoting community initiatives on adaptation.
- (l) Providing grants for improvements to houses.
- (m) Accrediting experts to give advice on adaptation.

27. The CAT could bring these policies and support together and deliver them in a coherent and consistent manner so that stakeholders responsible for developing an adaptation plan or solution could have coordinated access to them. Existing funding streams could be pooled together and coordinated and used more efficiently.

The state of the funding, support, training and other resources available for building capacity to adapt to climate change

28. Awareness of ACC activity is very low in local government and the roundtable highlighted that generally awareness of adaptation is low and consequently capacity to adapt is extremely low. Over 70% of respondents claimed that Government’s funding, support and training for local authorities to increase community understanding of the impacts of climate change and build council capacity to adapt as “unavailable” or “inadequate”.

29. The survey findings reinforce the roundtable discussion where funding was identified as a key challenge for many local authorities. There needs to be a step change in the support given to capacity building, in particular dissemination of good practice and signposting of funding sources.

The state of the funding, support, training and other resources available for specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure

30. In many ways the mechanisms put in place to manage flooding will set the template for the governance of adaptation. Government has been clear about the central role local government plays in flood risk management but has struggled to find a formula that successfully integrates the Environment Agency, the water industry, local authorities and other stakeholders all of whom have ownership rights and or statutory responsibilities.

31. The LGiU has lobbied for the establishment of flood management boards that bring together the local and national stakeholders into one decision making body which is close to the people and democratically accountable.

32. This board model is worthy of further consideration in wider adaptation management, such as by establishing *Local Adaptation Management Boards*. These ensure a local partnership approach that brings together the most relevant organisations with a clear focus and responsibility around adaptation. This Board would be accountable to the local authority or local strategic partnership, so that adaptation is also considered at the wider strategic level and with clear political leadership.

33. Notwithstanding the issues of governance it is also becoming clear that there is a significant shortage of flood engineers. There are still some remaining staff from borough engineering departments and at least there is a professional framework to build from. Many of the challenges of adaptation are new meaning that not only is there a shortage of staff there is also no professional framework to build on.

The state of the funding, support, training and other resources available for helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take

34. At present the scenarios developed by UK Climate Impact Programme (UKCIP) whilst scientifically robust are difficult to work with and use at the local level. It will be difficult and counter productive to dumb down this rich information source but it does need to be complemented by solution scenarios which will help local decision makers to understand what options are available to them in a given set of climate scenarios.

The state of the funding, support, training and other resources available for the monitoring and evaluation of work on adaptation, including thoughts on how progress on adaptation can be quantified and success measured

35. Current thinking around adaptation focuses on processes. The idea of Climate Ready is to try and describe an organisation that is prepared to adapt. Whilst this does not currently form a quantification of adaptation it is an approach worthy of further consideration.

- (a) *Community resilience and duty of care*: Local authorities are responsible for managing local resilience. As part of its responsibility to protect the community from dangers posed by impacts of climate change, local authorities need to reduce these dangers and ensure local areas and the environment are safe. As members are acutely aware of the sense among the electorate that they have the right to a safe, clean environment, local authorities will have to react responsibly or fail in their duty of care to their communities.
- (b) *Service provision*: Local authorities, as key service providers for communities, need to prepare for the diverse impacts of climate change on local services. Local authorities have a duty to prevent disruptions to local services, ensure people are prepared for the unavailability of certain services and prepare service provision that can operate in changed circumstances.
- (c) *Financial savings*: It is likely that local authorities can make financial savings in the medium to long term by investing in adaptation to climate change. For example, investment in flood defence in the short term can result in financial savings in the long term.
- (d) *Business opportunities*: Adaptation is about creating jobs and enabling the economy to be flexible to the impacts of climate change. These impacts will generate business opportunities, such as tourism and new technologies for flood defence. Local authorities can support local businesses and create an enabling environment to seize these opportunities, especially in response to the government's recent commitment to move to a low carbon economy.
- (e) *Knowledge and expertise*: Adaptation is also about bringing benefits to the communities and ensuring people are prepared for the impacts of climate change. Communities want to have the confidence that their councils have the knowledge and expertise in the area of adaptation to understand community needs, from advice on new business opportunities to mechanisms to deal with floods and heatwaves. Vulnerable groups of society would also want to be sure that councils have plans in place to support and protect them from the impacts of climate change.

The state of the funding, support, training and other resources available for the effectiveness of communication within and between departments and between government, local government, business and the general public on adaptation

36. The roundtable identified the importance of partnership working between the Government, local authorities, businesses, third sector organisations and academia, but acknowledged that it was presently poorly developed.

37. Any messages that communicate adaptation to the general public need to strike the right balance between risk awareness and the availability of solutions. The LGiU is advocating an approach called positive adaptation (see next question).

38. There is a danger that adaptation is seen as a predominantly technical agenda. Scientific and academic models of the impacts of climate change are being developed. The UKCIP is complex and it would be a lost opportunity if the Climate Change Risk Assessment were similarly opaque. Policy solutions are only possible if people and politicians are involved. The LGiU would advocate the use of visioning as a way of helping the general public to understand the impacts of climate change and to then decide how they should respond.

The state of the funding, support, training and other resources available for whether work on adaptation should be embedded into existing sustainable development frameworks and if so how that might be achieved

39. The LGiU is promoting the idea of positive adaptation. This approach is presented as an alternative to the current risk based and risk avoidance approach. Climate change is inevitable therefore it is sensible to put in place strategies that ensure the country, businesses and communities extract the maximum benefit. Adaptation will create the need for new technologies, new businesses, new housing and new ways of living. All these new ways of living do not necessarily have to be worse than the current one.

40. The philosophy behind positive adaptation is the beneficial integration of economic, social and environmental issues. As such it closely mirrors the thinking behind sustainable development. It should be relatively straightforward to demonstrate linkages between sustainable development policy and adaptation to climate change.

CONCLUSION

41. This paper represents the current thinking on adaptation in the LGiU. It draws directly upon experience of working in adaptation. In addition, the paper is informed by other work of the LGiU such as our consultation response to the Secretary of State for Local Government on “Stronger Local Democracy”.

42. The write up of the elected members’ roundtable and the full results of the survey are available to the committee upon request.

2 October 2009

Witness: Dr Andrew Johnston, Head of the Centre for Local Sustainability, Local Government Information Unit, gave evidence.

Q69 Chairman: Good morning. Welcome and thank you for coming. We are getting a lot of interest in this inquiry on adaptation and we are looking forward to what you have got to say. We are all quite tight for time, as you probably are as well, so we have got about 30 minutes or so to go through this with you. Could I start by asking why you think that many local authorities are rather badly prepared to respond to the challenge of climate change?

Dr Johnston: I think there is a whole suite of reasons for that. First and foremost, there is probably an intellectual confusion. We have just started a learning network for elected members to discuss the adaptation agenda and it was clear there was a lot of confusion between adaptation and mitigation. Mitigation had a lot of the big press and people understood what was going on there, but members had not quite drawn the distinction between adaptation to the inevitable impacts of climate change as opposed to some of the things they can do in order to mitigate it. That was the starting point and I think that is a general reflection on society, to be honest. More specifically, if you look at the

channels through which local government creates intelligence, namely through think-tank work and national governments, I do not think we are currently getting clear messages coming down to local authorities that this is what the adaptation agenda is really about, this is where you should focus your attention and here is some resource and support to help you on particular initiatives to get you started. Those very clear signals which local authorities are used to getting around important agenda are not currently coming through around adaptation to climate change.

Q70 Chairman: Do you think there is a particular weakness with elected members?

Dr Johnston: I would not say that, no. One of the pleasant surprises of running the learning network that we did for about 30 elected members from across the country was the high level of awareness and sensitivity and that they knew they should be doing something about adaptation to climate change. I am not sure you would necessarily find that

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across society or the rest of local government where people are focused on their specific service provision priorities, et cetera. I was pleased that we had the meeting—they were the converted I suppose—they were more aware than I was expecting.

Q71 Chairman: Is there anything that central government should do to try and address this area in terms of raising awareness about adaptation issues within local government?

Dr Johnston: Yes. Starting from the political perspective, I do not think there have been the debates around adaptation to climate change that you would hope there would be. I think this Committee is a really useful start to that process which I believe will grow and grow over the next couple of years in terms of importance. One of the things that I am interested in trying to develop is different solutions and different political solutions. What is the Conservative take on adaptation to climate change, what are the Labour and the Liberal Democrat takes? Where are the new ideas coming through and how do we debate and discuss which of those ideas are currently best? That is not happening at the national level, in my view, so consequently it is not happening at the party conferences. I went to all three party conferences and there were not massive debates about adaptation to climate change. There were elements of it, heat wave, flooding, things like that, but most of the debates were about mitigation.

Q72 Martin Horwood: This is half a question and half a point of information. I declare a party political interest, I guess, as a Liberal Democrat. I have to say we did pass adaptation policy quite specifically in *Zero Carbon Britain* two years ago. That is the party I know about, so I hope you were right in what you said about the other two parties. That debate is happening at national level sometimes, and maybe you just do not know about it.

Dr Johnston: I suppose my response would be that I was at the Liberal Democrat Conference and obviously trying to seek out events that were around adaptation to climate change and there simply were not that many. Most of them were on the policy that was being posed at that particular conference, which was around biodiversity and local management of natural resources, which is very closely associated.

Martin Horwood: Adaptation policy was specifically adopted at the previous year's conference. You just need to go a little careful in your judgments.

Q73 Colin Challen: The LGiU¹ has argued for the creation of Local Management Adaptation Boards. What do you think are the benefits of such a proposal?

Dr Johnston: A lot of the reason we have suggested this has come from the experience of trying to think through governance structures for managing flooding. We have done a lot of work on the Flood and Water Management Bill lobbying for local government to have coherent structures in place in

order to live up to the responsibility that they will be given under the Bill. What we found with flooding, which is an area which has a fair bit of a track record to it, was there is still an enormous amount of confusion and uncoordinated responsibilities. The example I always like to give is a big river joining a small river with a road going over the top and a culvert. The big river is the Environment Agency, the small river is the district council, the road over the top is the Highways Agency and no-one knows who owns the culvert, yet it is the county council, the responsible lead local flood authority, which has to sort out the mess. Taking that as a starting point, it seemed to me that a much more slimmed down and coherent decision-making structure would be the best way of dealing with this. When you look at the broader, less tangible aspects of the adaptation agenda, that seems to me to reinforce the need for a coherent and simplified decision-making structure.

Q74 Colin Challen: Typically, what would happen after the floods, say, in Cumbria? Would people get together at the national and local levels to analyse what happened and how their responses could be measured against certain criteria?

Dr Johnston: Yes, they would. Cumbria was unfortunate enough to have floods a few years ago, so has been able to learn those lessons and put them in place. What we are seeing is a much better, coordinated and joined-up response in an area that suffered from flooding a few years ago and has now suffered again. The impacts of climate change are slightly more random and you cannot rely upon the fact that people have learnt from previous experiences about how to deal with future experiences, and I think that is why we need something a little more structured to help that process.

Q75 Colin Challen: You are saying the coverage nationally in our response at the moment, even in the absence of these Adaptation Boards that you propose, is patchy but many local authorities, perhaps—not pinning the blame all on them—if they have not had previous experience will think, “It is not a priority for us”?

Dr Johnston: Yes.

Q76 Martin Horwood: Can I ask a question specifically on that issue? I do not want you to think I am on your case today but it seems to me you are being a little unfair now on the Government because in the Floods Bill that has come before Parliament they have proposed a much more streamlined responsibility on flooding which does beg the wider question of whether or not these Adaptation Boards would not duplicate something which could just be given as a lead responsibility to local authorities. What do you think of the structure that is proposed in the Floods Bill?

Dr Johnston: My understanding of what is suggested in the Floods Bill is responsibilities, not structures. The structures are for the local area to decide. I suppose what I am saying is the experience that we have had working with local government is the

¹ Local Government Information Unit

structure which they prefer to put in place is something which is much more streamlined and pulls together all the disparate bodies in a particular geographical area. My understanding is that the Bill will not stop that happening, but it certainly is not something that is suggested in the Bill.

Q77 Colin Challen: Total Place is considering how a “whole place” approach can lead to better services. Should adaptation have been included in the pilots for this Total Place programme?

Dr Johnston: Clearly I am going to say yes, I wish it had been, but I understand the reasons why it was not. Total Place is a relatively new idea working its way through and it is understandable that a lot of it is focused on core services with a long history behind them. Fair enough on that front, but as Total Place rolls out and becomes much more comprehensive across local strategic partnerships then you do need a strong voice for the adaptation discussions to actually get a seat at the table because the pooling of these budgets will inevitably lead to directors of core services having a very strong voice in those discussions about where money is allocated and the adaptation debate without that strong voice could potentially lose out.

Q78 Colin Challen: We used to have a civil defence planning regime and at county council level they used to have centralised, if not bunkers then certainly departments which dealt with that kind of contingency. Do we still have that? Is there still an infrastructure in place where you have emergency planning as a priority?

Dr Johnston: Local Resilience Forums are at the very heart of that process. One of the suggestions in the paper is that one approach to adaptation is to look at that Resilience Forum model and see how it can be expanded and developed to deal with some of the main issues around adaptation. At the moment, the scope of the Resilience Forum is quite tight, it is around risk assessment, identifying the big risks and then managing the emergency services as they respond to particular disasters, so long-term planning in advance and then the long-term recovery that comes after a particular event is not really part of the Resilience Forum’s scope, although there is no reason why it could not be.

Q79 Colin Challen: If there is an emergency will people have—I know this is all jargon—a one-stop-shop for emergencies? This Total Place and so on sounds fine, but will people be confused still after this has been brought in about who is in charge in a local emergency?

Dr Johnston: Inevitably, because these events go all the way from a global perspective down to a specific impact on your house and then a long time afterwards various services being involved in helping recover from whatever happened, it is very hard to see one organisation being able to be the one-stop-shop for that. I do come back to the idea of the Local Adaptation Management Boards as being an opportunity to at least bring all of the players who

are involved in that long chain of events into one decision-making body so that they can come up with a structure which works best within a locality.

Q80 Colin Challen: How happy are local authorities with the National Indicator 188? Is it helpful to local authorities or is it a bit of a tick box exercise, do you think?

Dr Johnston: My understanding of the uptake of NI 188 has been that elected members’ and senior decision-makers’ engagement has been low with NI 188. There are specific officers who are the ones who lead on either the adaptation agenda or the climate change agenda or the reporting framework who tend to have led on putting together the evidence for the processes that NI 188 asks for and then reflecting those back on government. We are not hearing that it has been a stimulus for political debate or radical changes in decision-making.

Q81 Colin Challen: If you are looking at preparations for emergencies, we can see how you could measure outputs but perhaps measuring outputs or outcomes could be rather more problematic, for obvious reasons. Do you think perhaps an output- or outcome-based approach should be looked at?

Dr Johnston: I think we have to get to that point for two reasons. The first one is that quite quickly we need to move to having far greater clarity about what we mean by adaptation to climate change and, therefore, that means we are able to identify and assess what it is that we hope would be happening within localities to tackle that. The adaptation agenda has to move on relatively quickly and get to the point where it knows what outcomes it is looking for. Also, from a local government perspective I think what local government would want is help from government in the general direction that they should be heading, but they do not want a process-based indicator which tells them exactly how to do it.

Q82 Colin Challen: Less than 40% of local authorities have included NI 188 as a priority in their current Local Area Agreements. What can be done to increase the number that are prepared to prioritise adaptation in local area agreements?

Dr Johnston: I would suggest it is actually quite hard without the demand from the electorate. The framework for which these indicators and particularly the local area agreement indicators are to sit within is the sustainable community strategy, the story of place, which is something that local authorities pull together with the people who live within the area. The LAA² framework is to reflect the priorities of the people within a particular area. For adaptation to find its way into those 12 indicators then it has got to be seen as the solution to the problems that the electorate have been putting forward as part of that process. The long-term answer to whether an indicator on adaptation would find its way into the LAA is if the people think it is important enough then it should do. The alternative

² Local Area Agreement

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is there is a top-down incentive from national government: “If you took on NI 188 we would smile upon you under these particular circumstances”. I think I would prefer the former, but the latter would be quicker.

Q83 Colin Challen: If it is driven by the electorate then it may only be driven after the event, which is too late, so perhaps we should have a requirement to set targets on adaptation.

Dr Johnston: I would not have a difficulty with a local area deciding what it is going to do about the adaptation agenda and being held to account for that. In Cumbria, for example, it would be relatively straightforward to identify their adaptation priorities and to say to government, “We will increase our preparedness for these risks and that is our big adaptation measure for the next year, or two or three, and we are happy to be judged on that”

Q84 Colin Challen: Defra has excluded for the time being local authorities from the reporting requirements in the Climate Change Act. Do you think that ought to change, that there would be benefits if that requirement was initiated or would the benefits be outweighed by the cost of yet more reporting?

Dr Johnston: That is a tricky one because obviously there is a case for, “Why isn’t local government reporting in the same way as other parts of the public sector” and inevitably the private sector is involved with water companies, et cetera. It would be helpful to have that co-ordination. However, a lot of time and effort has been invested in NI 188 as it exists and, despite my earlier criticisms, it has been extremely useful in a technical sense in doing the local risk assessments, in identifying what the big problems are and coming up with suggested strategies for taking them forward. My feeling at the moment is that I would be looking for a long-term change around this, but not a short-term shift to the duty which would mean that a lot of work that has been put in by local authorities would effectively be wasted.

Q85 Martin Horwood: Can I ask you specifically about the UK Climate Impact Projections which were issued to local authorities in the summer. What impact do you think they have had on local authorities? Do you think local authorities need more support to make best use of them?

Dr Johnston: Surprisingly little impact, I have to say. I was one of the people who were waiting with bated breath for the projections to come out because I thought this would turn the debate and we would have a completely different attitude to adaptation after these scenarios came out. Unfortunately, that has not been the case and the evidence that is coming through from local authorities is they are not using the scenarios or their capacity to work on the scenarios in anything like the numbers that we hoped would be the case. There is a disappointment there. Obviously there is a need for further work in terms of the interface between the data and the potential users. At the moment there is a training programme going on for local government officers

to get engaged, which is obviously a good thing, but it seems to me if this is going to make a real difference everybody needs to be looking at these scenarios, the community, industry, everyone needs to be looking at them, talking about them, discussing them, and that does not seem to be happening.

Q86 Martin Horwood: From my local experience, I am not aware that they have penetrated through even to elected members, let alone the wider public. Do you think we need to have a different way of delivering information or does it just need to be about more guidance on what you are supposed to do with this information and how to use it or implement it?

Dr Johnston: I think the former. Providing more guidance does not feel like it is going to be the answer, to be honest, there has been plenty of guidance and exhortation out there. Changing the interface so it is more user-friendly would be something which would be useful long-term, but short-term I think what is going to have to happen is whoever does really understand how to use UKCIP³ and produce useful data out of it has to do that and provide that data for local authorities. So local authorities to be provided with scenarios for their areas which they can take from there, as it were.

Q87 Martin Horwood: Can I ask you about your suggestion of a Climate Adaptation Trust at national level? You do seem to be keen on setting up a lot of new bodies and structures at a time when most of government is going in the opposite direction. The obvious question is how much do you think it would cost to run and establish this?

Dr Johnston: The first point on that, the Local Adaptation Management Boards are about removing tiers of decision-making around adaptation and streamlining, so it is not about a new structure, it is about removing tiers. The Climate Adaptation Trust—I do make the point that I use the terminology for effect to get people to understand what I am heading for. You can see from the rest of the paper that we can see this being part of the Carbon Trust or the Energy Saving Trust or part of Defra. It is a brand more than necessarily a whole new organisation. The point being, there is a whole raft of functions which we list around the adaptation agenda which are to do with stimulating business, people understanding more about what is going on. Things that the Carbon Trust and Energy Saving Trust do for mitigation are currently not being done for adaptation, so somebody needs to step in and do those.

Q88 Martin Horwood: It is an interesting slightly philosophical debate, I guess, but the Carbon Trust, the Energy Saving Trust and others have a very clear focus on mitigation that is quite different in many ways from managing environments to adapt to climate change. For instance, would it not be more

³ United Kingdom Climate Impacts Programme

logical to extend the responsibilities of UKCIP and give them a more proactive adaptation agenda as well as just looking at the impacts?

Dr Johnston: Our starting point was the same as the Chairman's: what is going on in the round; what are the debates; what is happening; what is the level of awareness; and how do you get to that point. On how do you get to that point, our feeling was more to do with the strategies which are being employed currently by the Carbon Trust and Energy Saving Trust about behaviour change in society than they are about where the strengths of UKCIP are, which is providing the evidence and information to understand what is going on. We need both obviously, but it seemed to me the better skills match for a strategy for an Adaptation Trust would be the Carbon Trust and the Energy Saving Trust's work.

Q89 Martin Horwood: On an issue like flooding we have already got the National Flood Forecast Centre where you have got the Environment Agency and the Met Office working together. It is not obvious that those kinds of skills on hydrology and landscape are particularly present in the Carbon Trust or that family of bodies, but you think there is a skills match, do you?

Dr Johnston: In terms of the list of activities that we have outlined there, I think the skills match is closer to those organisations. I make the point later on, and I think you ask questions, about skills gaps generally around this area, and there are vast skills gaps and that is why part of the role of any new body would be to stimulate interest and fill those gaps.

Q90 Martin Horwood: My point is on that specific example of flooding and landscape. I think the Met Office and Environment Agency might take it amiss if you say there is a skills gap, I think they think they have got the skills. You are setting up something that seems to be under a separate structure. Are you sure there is not a risk of having too many of these things and too much duplication in the end?

Dr Johnston: There could be. I come back to the basic point that there is a gap. Taking flooding as the example, the Environment Agency are doing a lot of really great work, especially on the technical and evidence side of things, things have really stepped up working with the Met Office, et cetera. I know they were very pleased with their performance up in Cumbria, which was a step up from the Gloucestershire floods of summer 2007, so that is all going extremely well, but I think they would also acknowledge the fact that they do not have the capacity or even the inclination or part of their mission to work on future solutions to the flooding problem in Britain, stimulate new technologies, stimulate people to get together to pool resources to make things happen. All of that softer side, if you like, is not currently part of the Environment Agency's remit but my feeling is if we are going to adapt successfully we need both to be going on.

Q91 Mark Lazarowicz: The Local Government Association has said local government should be responsible for taking local adaptive action but

should not be expected to meet all the costs, which is perhaps not surprising. What are the principles that we need to use to decide who does pay locally? For example, how do you take account of the fact that clearly some authorities may require very large-scale adaptive action but may be quite small authorities with small resources?

Dr Johnston: In terms of the broad strategy you need to have a mixture of funding for vulnerability and then wider funding for resilience. It is the mixture of the two that we need to put together. In the example where a small local authority has lots of vulnerable groups, clearly that strategy is around national government being able to identify where the vulnerable groups are and allocate resources per the vulnerable group rather than necessarily the geographical location. That underpins things, but there is a broader resilience issue here that is something we do need to find new sources of funding for. In terms of the flooding, things that we have been looking at are the use of bonds, funding leases, the use of the business-rate supplements, looking at differences in insurance values and whether or not that can be a benchmark for giving loans to property owners, for example. We do need to unlock new money around this whole area and in order to do that we have to use different financial mechanisms that are to some extent based upon partnership. If a business community or a community wishes to join with the state in order to improve the resilience of their particular area then we need to find mechanisms that will help them to do that.

Q92 Mark Lazarowicz: Is that not going to cause a problem? You might have some areas where businesses are stronger and are more economically successful areas that can raise money in that way and others that may not be successful may still have very large needs for adaptive action. Does that not to some extent require some centralised funding regime as well and is that not going to make it more difficult for local government to be the ones taking responsibility for local adaptive action, or is it simply a case that big schemes should be funded centrally and local schemes funded locally? How would you go about that?

Dr Johnston: Something similar. I would say big and vulnerable. Clearly there is a national imperative there to make sure that something happens, but small, local and where groups are not necessarily at immediate threat but feel that they want to take control of their own responses to adaptation, those should be local responses. The situation you have outlined where different things will happen differently across the country is localism and people decide priorities within a local area.

Q93 Mark Lazarowicz: Okay some things can be done locally but can you not see circumstances where perhaps on a particular river or water course one authority does something in its area which then has a negative effect on the ones downstream because it may not be able to do it there? Surely there has to be a bit more co-ordination than leaving it very much up to a local level in this particular area

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because of the fact that consequences can be in more than one area? Clearly if there is a very local problem that is something the local authority or local community can deal with but it is not one which is too easy to do on a local basis everywhere, is it?

Dr Johnston: Not everywhere, and I return to the earlier discussion with Colin Challen, hence the idea of the joint management boards because particularly for flooding these are catchment-based organisations in order to work properly, and so you have vertical integration within a local authority area but you also have horizontal integration across local authorities within a catchment, so you get the joining up of policies and strategies, so one local authority does not put a housing development on their plot of land which actually makes things worse for people further down stream.

Q94 Mark Lazarowicz: What are the common discussions that are taking place, which I assume are taking place, between central and local government about how adaptive action should be funded? Are you aware of that? Maybe it is not in your remit.

Dr Johnston: I am not really aware of those discussions, to be honest.

Q95 Mark Lazarowicz: Maybe that is for the LGA or the LGiU, I do not know.

Dr Johnston: Probably. We know that the Adapting for Climate Change Centre has about £9 million of funding and that feels like about a tenth of what would be required to make a significant difference to adaptation in the UK.

Q96 Mark Lazarowicz: Are there any particular barriers to local authorities funding adaptive action at present, other than just lack of money—organisational barriers, planning barriers, something like that for example?

Dr Johnston: I think there are significant what I would call governmental structural barriers which are to do with local authorities generally being able to make decisions which affect their local area across the board, and they do apply in terms of adaptation to climate change as well in so much as, for example with flooding, the Environment Agency tends to decide where most of the cash is going, and not necessarily to the local area. Then the heat wave side of the adaptation agenda is a slightly different set-up in so much as there is a big lack of knowledge there, and so support is required for local government but, again, the anticipation will be that the national house building standards will come down and they will tell local government exactly what a resilient house looks like within their area. In terms of any local authority taking a lead on these things, it is still quite difficult given the fact that it is very difficult for them to come up with local planning by-laws and local building regs and things like that and actually take a lead and take it forward.

Q97 Mark Lazarowicz: Are there risks that competing short-term priorities could squeeze out investment in longer-term action?

Dr Johnston: Absolutely. We know that local government is looking at something like a 20% squeeze on finances next year. Inevitably ideas which have not even started yet may not get the support that they may have done in better times. If you are looking at cutting existing services, it is very difficult to justify new services coming through.

Q98 Mark Lazarowicz: And is there a possibility that some local authorities at least might be put off from taking adaptive action if they see central government meeting the cost of clearing up the effects of extreme weather? If others are going to do it then why should they do it? Is there a danger that that might happen?

Dr Johnston: I do not think so, to be honest, because despite the fact the Government is stepping into and putting a lot of money into recovery from the Cumbrian floods, for example, we know that there are significant long-term impacts from weather events of all sorts which government funding does not cover and which the local authority has to pick up and take into the future and the health sector has to pick up and take into the future. Things which are not talked about in terms of these events are for example the effect on the mental health of people who have been impacted by these events. The Government is not swinging in and paying for that, for example.

Mark Lazarowicz: I can see that from experience of my own constituency, in fact.

Q99 Chairman: The Greater London Authority has a climate change duty requiring it to mainstream climate change adaptation across its strategies. Do you think it would be helpful for other local authorities to have the same thing?

Dr Johnston: Not yet I think is my response to that because until government is completely clear about what it means by adaptation to climate change, it makes it very difficult to have a duty on local authorities to actually deliver on this thing. As an example, in a different part of the LGiU we are also working on the power to promote local democracy, which was in previous legislation, and that is also extremely difficult for local authorities to understand and take forward because it is such a nebulous concept. While adaptation is still a nebulous concept I would say no. When it becomes clearer and people have a much better idea of where things are going then maybe. For the time being we would argue that powers to locally adapt would be much more useful than a duty to have adapted in some way.

Q100 Chairman: A lot of what we have been discussing in the last half hour is process and technical. One of the reasons perhaps that some elected members do not get very excited about this or interested in it is that there does not appear to be a big political question that they need to be addressing. Do you think that is a problem?

Dr Johnston: I think it is a problem but my feeling about where that will go is the security agenda. Many councils now are talking about climate change

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mitigation as an energy security issue and that is something which has much more resonance locally than climate change, is it man-made, et cetera, et cetera, et cetera. You can put all those debates to one side and you can talk about what a local authority member is doing for their constituents in their area, and it is around security and safety and “that’s why you voted for me in the first place.” I think we can begin to get a narrative going around adaptation to

climate change in the same way, that this is about the long-term security and resilience of the area where people live. If you talk about it in those terms, then I think you will begin to get purchase from local authority members rather than talking about this abstract concept of adaptation.

Chairman: That is very helpful; thank you very much. We have to draw it to a close because we have a couple more witnesses to come now. Thank you.

Supplementary memorandum submitted by the Local Government Information Unit (LGiU)

OVER THE LAST TWO YEARS DEFRA’S ADAPTING TO CLIMATE CHANGE PROGRAMME HAS SET UP A NEW ORGANISATIONAL FRAMEWORK FOR ADAPTATION

Is the framework coherent?

The Adapting to Climate Change (ACC) Programme is a positive step the Government is taking to bring adaptation into the climate change debate. While the Programme aims to develop evidence based impacts, raise awareness and embed adaptation across Government policies, there remains a lack of clarity on what adaptation really is in terms of practical measures and actions that can be taken. Of particular importance is the artificial pushing together of regional and local challenges and opportunities. Regional structures are directly accountable to government, deliver little and are driven by economic development. Local government is accountable to the people in an area, delivers many services and is driven by a wider range of drivers from clean streets to care of the elderly. It would make more sense to focus tightly on local government as the best articulation of demand for adaptation support.

Are the roles of national, regional and local government clear and appropriate? The role of local government is not clear as demonstrated by local authorities’ unawareness of the ACC Programme. This may be because adaptation is still not adequately defined in terms of practical measures and actions, so councils don’t know what they need to be doing to adapt or support communities to adapt. There may also be a lack of coherent and consistent messages between Departments, more broadly on climate change but also on adaptation. For example, advice is given to local authorities to avoid development on flood plains yet the Government continues to set new housing development targets for councils, putting pressure on already restricted land.

Why are Whitehall departments not engaging with the Local and Regional Adaptation Partnership?

A shortfall of financial clout and direction. LRAP has a budget of £150K pa. This must be considered by somebody as an appropriate amount for service deliverers and politicians on the ground to properly address what many call the greatest challenge faced by our generation. Clearly it is not enough, so the answer lies in national, regional and local government pooling resources properly to give LRAP a certain weight. The second element is direction, which needs to be much clearer and capable of being understood and interpreted by other departments so they can see how it fits with their priorities. Finally, senior civil servants get together across government departments formulating strategy on adaptation which has a direct impact on local government but there is no connection to LRAP.

How does their lack of engagement impact on local authorities?

It creates the perception that adaptation is a Defra responsibility and therefore is an environmental issue. This would inevitably resonate at the local level where local councils that work on adaptation would place it within the Environmental Directorate, when it should be mainstreamed across all departments. The lack of engagement from other Whitehall departments also gives the impression that adaptation is not important enough for local authorities to take seriously. This affects funding priorities and resource allocation at the national level, which would affect local priorities.

If the Local and Regional Adaptation Partnership isn’t valued by all partners is there something else that should be invested in instead?

There is a need to set up a structure that promotes a positive engagement between local, regional and national government in order to develop policy, share good practice, raise awareness and facilitate practical implementation. The starting point for this would be to invite leaders of influential councils, some RDA Chief Executives, senior local government officers who are experts in different dimensions (eg infrastructure, health, emergency planning) and representatives from different government departments who are also

engaged in interdepartmental dialogues on adaptation strategy. The group would need to be confident that it could suggest policy and projects that are likely to be funded. The group's starting point would be the development of a three-year action plan.

THE ADAPTING TO CLIMATE CHANGE PROGRAMME HAS A LOW PROFILE IN LOCAL AUTHORITIES

What benefit would there be in it raising its profile in local government?

It would demonstrate to local authorities that the Government is taking the impacts of climate change and adaptation seriously. Better awareness of ACC will also enable councils to access reliable and timely information. However, the ACC will not only need to be high profile but also need to have better and more relevant information for local authorities, not just information on what Defra is doing but also practical ways of supporting councils.

How should it do this?

The projections in practice was a good attempt at reaching out to stakeholders, but the turnout was low and this could be due to a low awareness of ACC. One option is to utilise sector organisations, such as the LGiU or LGA for local authorities (similarly the CBI and BCC for businesses and the National Farmers' Union and Country Land and Business Association for farmers) to reach out to relevant stakeholders. It could also run pilot schemes to demonstrate exemplars and good practice and work with the third sector and community organisations to encourage public demand for better adaptation measures from local authorities.

What action has the Adapting to Climate Change Programme taken to assist public bodies to make the most of the opportunities presented by climate change?

The ACC recognises the need to identify the opportunities but little action is taken to advise and develop measures to identify and make use of opportunities. More could be done to map products and services that will thrive in a world that is 2 or 4 degrees warmer. It could also commission research to quantify the financial costs and savings of taking specific adaptation action in the UK. The LGiU suggestion of a Climate Adaptation Trust aims to address some of the gaps in the current resources available to take action on adaptation.

Does it need it take more action, and if so, what should it do?

It would appeal more to local authorities (and other public bodies) when adaptation is presented as a cross-sector issue. Therefore, rather than promoting adaptation as risk assessment and management, ACC should promote "Positive Adaptation", a concept the LGiU has been promoting to address the social, economic and environmental benefits, which closely mirrors the thinking behind sustainable development. It calls for organisations to use resilience and adaptation to create a new way of living that manages risks of climate change, maximises economic opportunities and addresses social justice for those most vulnerable. This requires better coordination between adaptation, mitigation and economic development.

What can councils do to help local communities and businesses to realise the benefits of climate change?

Firstly, councils are likely to succeed in getting community buy-in into adaptation by making it a security and resilience issue. Therefore the more communities adapt, the more secure they will be from actual and predicted impacts of climate change. However, councils also need to complement the security issue with opportunities for businesses and communities. Councils already provide advice to communities about business opportunities from regeneration and tourism and social benefits of walking and cycling. In response to the impacts of climate change, councils could:

- Promote local food production and demand.
- Identify and raise awareness of challenges and opportunities in the new fishing and agricultural industries.
- Identify economic advantages for the local area and promote economic development and growth in these sectors.
- Advice and support for businesses looking for new economic opportunities, such as new crops for farmers and retrofitting existing homes for builders and designers.
- Promote training and jobs in the emerging sectors.
- Information on outdoor leisure activities and places available for families.
- Promote new tourism opportunities to local businesses.
- Provide information to visitors on new leisure activities and sports.
- Promote alternative mode of transport such as cycling and walking.

Memorandum submitted by the Town and Country Planning Association

1. Summary of TCPA Submission

1.1 Climate change is the most pressing social, economic and environmental challenge facing UK society today. It will have a significant impact on all sections of the UK population, particularly members of vulnerable groups, across geographical and political boundaries. The changing climate with higher temperatures, wetter winters and increasingly uncertain climatic conditions across all the seasons will have a lasting impact on how people live, work and play. Climate change will radically change the way our towns and cities are planned, how they develop into the future and, most significantly, the way that human society views its place within the eco-system in the UK and beyond.

1.2 The Town and Country Planning Association (TCPA) is working to influence policies now to ensure their implementation for the benefit of future generations. Representing the views of our cross-sectoral membership, TCPA is currently leading on several strands of important policy development and project work. This commitment is founded in our new manifesto, *Towns and Countryside for a New Age of Challenge* (2009), in which we set out the vision for the future. One priority is to plan for the future of our towns and countryside to address, directly, the challenges arising from climate change.

1.3 In this submission, the TCPA highlights the following issues:

- *Statutory Basis*: The statutory basis for delivering climate change adaptation through planning is in the right direction for the UK as a whole. However for the respective UK nations there is a need to concentrate on delivery at the grass-roots level led by local authorities,
- *Potential conflicts*: The need for a practical alignment between mitigation and adaptation in terms of policies in development plans alongside advice and guidance on delivering developments,
- *Resources*: Significant resources and greater capacity are needed to deliver adaptation measures through co-ordinated spatial planning across national, regional, sub-regional and local scales. However these are likely to adversely affected through across the board planning reforms for development planning and development management,
- *Inconsistent Information*: The inconsistency of available information and data sources to support decision-makers looking at new development across the UK nations may impede effective iterative adaptation action through the spatial planning process.

1.4 In this submission, the TCPA highlights the following opportunities:

- *To embed adaptation and wider sustainability principles*: Planning for the upturn in development provides a timely opportunity to embed adaptation and wider sustainability principles in development proposals.
- *To make more effective use of planning obligations and infrastructure investment*: The more effective use of planning obligations and proposals for a new infrastructure funding mechanism aligned with the local planning process will ensure a co-ordinated planning and investment programme for adaptation.
- *To align existing monitoring and reporting processes*: Align with existing processes of monitoring and reporting, including greater encouragement by central Government for English local authorities to take up National Indicator 188 as part of their corporate reporting activity.

1.5 Finally the TCPA makes the following recommendations:

- *Transformational change in spatial planning*: There must be transformational change in the culture of spatial planning to place climate change and adaption at the heart of decision making. This requires greater prescription in national policy as to the importance of climate change.
- *A step change in the skills and education of decision makers, both political and professional, in local and regional government.*
- *To establish a Climate Change Technical Advice Body*: A new technical advice body on climate change is required to provide a trusted source of advice and information for local government on climate change. This advice body would agree key methodologies and data sets as well integrating the advice of differing agencies on adaptation and mitigation.

2. About the Town and Country Planning Association (TCPA)

2.1 Founded in 1899 the TCPA is the UK's oldest independent charity focused on planning and sustainable development. Through our work over the last century we have improved both the art and science of planning in the UK and abroad. The TCPA puts social justice and the environment at the heart of policy debate and seeks to inspire Government, industry and campaigners to take a fresh perspective on major issues, including planning policy, housing, regeneration and climate change. Our objectives are to:

- secure a decent home for everyone, in cohesive, well designed communities;
- empower communities to influence decisions that affect their future; and
- promote high-quality development through better planning of the use of our land.

2.2 The TCPA is currently undertaking the following major policy development and project work around climate change adaptation:

- *From Autumn 2008*—The TCPA is leading a 3-year project financed by the European Union European Regional Development Fund under the INTERREG IVC Program called GRaBS (Green and Blue Space Adaptation for Urban Areas and Eco-towns—www.grabs-eu.org). There are 14 partners, all with varying degrees of experience, drawn from eight member states representing a broad spectrum of authorities and climate change challenges. GRaBS is designed to facilitate the exchange of knowledge, experience and good practice in climate change adaptation strategies. For further information see Annex 1.¹
- *From July 2009*—TCPA established a new Climate Change Unit. Led by TCPA's Chief Planner, Dr Hugh Ellis, it will take forward the TCPA's climate change policy development and campaigning work. A major part of this work will be support for the Planning and Climate Change Coalition. The coalition will be publishing a mock Planning Policy Statement or "position statement" in the Autumn; and
- *On-going*—TCPA continues policy work on the review of Regional Spatial Strategies and UK-wide policy consultations to ensure climate change adaptation is embedded in decision-making and plan-making where appropriate and necessary in pursuit of sustainable development through planning objectives.

MAIN TCPA SUBMISSION

The TCPA welcomes the opportunity to contribute to this timely inquiry by the Environmental Audit Committee into climate change adaptation. This Inquiry follows closely from, and must seek to make the most effective use of, findings from recent inquiries and studies by the RCEP (2009), EAC (2008) and Pitt Review (2008) so as to avoid duplication of work. This submission provides evidence under specific issues of interest outlined in the Committee's Call for Evidence.

The Committee should note that the emphasis of the TCPA's submission is on the capacity and capability of the *spatial planning systems of the four UK nations to deliver on adaptation*, in accordance with our area of expertise and experience.

3.0 *ISSUE 1: How well the overall direction for work on adaptation has been set, the effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance), the allocation of powers and duties and how well issues like social justice are addressed in adaptation policies*

OVERVIEW OF THE PLANNING SYSTEMS' CAPACITY TO DELIVER ADAPTATION

3.1 The TCPA believes that the UK's four statutory frameworks as a whole, and as individually established by the devolved administrations, are beginning to move in the right direction. Public authorities broadly have the necessary duties and powers to take adaptation action as part of carrying out their functions. This is particularly with respect to the planning and development of land although uncertainties exist with their application specifically for adaptation purposes.² While the TCPA does not question the UK's overall commitment to adaptation action, our concerns relate to conflicting statutory action taken amongst the four nations.

3.2 As an illustration, the TCPA commends the Climate Change Acts as an important step for the UK as a whole to build adaptive capacity in policy terms. However, unlike the Climate Change (Scotland) Act 2009, the Climate Change Act 2008 applicable to England, Wales and Northern Ireland falls far short of the mark in ensuring that the adaptive action is, and should be taken, at the local level of implementation. The Scottish 2009 Act places a statutory duty on local authorities as a public body to with respect to climate change. In contrast the 2008 Act simply empowers the Secretary of State to require designated authorities to report on their adaptation action. *Of great concern to TCPA is the fact that local authorities are not included in the draft designated list, Wales has yet to take the step to identify such a designated list of reporting authorities, and the duty for adaptation in Northern Ireland is comparatively weak.*

3.3 In addition, there continues to be uncertainty and delay as a result of planning reforms implementing new development plans across England, Wales and Scotland, and those emerging from Northern Ireland. In particular in England the suggested abolition of regional planning would create a potential hiatus in effective planning between national and local levels and ultimately affect the capacity and capability of planning professionals to deliver effective and co-ordinated adaptation action.

3.4 The need that the TCPA sees for national targets set at national level reflects the principle of subsidiarity in which decisions should be made by the most competent local, regional, national or international level. Climate change is a global issue with targets agreed by international treaties, national governments are responsible for national policy to deliver—or exceed such targets. In this context local authorities should be free to determine how and where (in land use terms) to meet the targets which apply

¹ Not printed. See Annex A of *Helping to Deliver Climate Change Adaptation through the UK Planning System*, prepared by the Town and Country Planning Association, published August 2009.

² In reference to the sustainable development duty, use of well-being powers, use of planning conditions and agreements, and use of compulsory purchase orders.

to all other tiers of government as to themselves. The TCPA case is that local authority abrogation of international and national targets would be irresponsible and hugely damaging to our chances of meeting the climate challenge head on and thus nationally/internationally imposed planning targets imposed are appropriate for all the players in the planning and development system including local authorities.

3.5 To further highlight the TCPA's perspective, we refer to the following statements taken from the executive summary of TCPA's study commissioned by the Royal Commission on Environmental Pollution (RCEP) to help inform their final report. (Please see the full report attached as Annex 2 for further detailed findings).³

3.6 The overall conclusions of the (RCEP) study are that its findings reinforce the powerful statutory basis of the UK planning systems. At its best, the system is capable of integrating and giving spatial expression to a range of policy priorities within the sustainable development paradigm. Policy-makers and practitioners recognise that delivering adaptation needs to be embedded within the development plan-led approach of the planning systems. From national policy guidance to regional, sub-regional and local development plans, measures to adapt the built environment and various land use development activities need to be implemented in an integrated manner.

3.7 But for now, the complexities of implementing adaptation across stakeholders from different sectors, parallel strategies and plans, and organisational structures and hierarchies in the context of significant planning reforms have surpassed the capability and capacity of planners and planning departments. The study also indicates the lower tiers of the planning system hierarchy are underperforming—particularly when measured against the ambition of some national planning policy.

3.8 Therefore, it is imperative that policy-makers take note of the findings of this report as well as the final report from the RCEP, and seek to ensure that the institutional capacity of the UK planning systems will be fit-for-purpose as part of the wider co-ordinated effort to tackle the challenges of climate change.

ELIMINATING CONFLICTS IN PLANNING POLICY AND DELIVERY

3.9 Policy measures aimed at combating climate change must be coherent and coordinated. Policies, and indeed research and practical guidance, have focused particularly on climate change adaptation or mitigation but never as part of a coherent approach to sustainable development. TCPA believes that specific research is required to address this issue in current policy and range of existing practical guidance for planners.

3.10 In addition, cases of conflicts between other areas of planning policy that could prevent planning authorities effectively delivering on wider adaptation objectives. An example of this is the “Effective Use of Land” policies (paragraphs 40–44) in Planning Policy Statement 3 on Housing. Government sets a national target of 60% for the re-use of brownfield land for redevelopment. Regional Spatial Strategies (RSS) and Local Development Frameworks (LDF) have used this target to encourage urban regeneration and discourage potentially sustainable greenfield developments, rather than considering the benefits of proactive planning and re-use of brownfield and greenfield land to form a network of green infrastructure to contribute towards adaptation. Planning authorities use the 60% target as an indicator of the preferred level of development and consider the higher the percentage the better.

4.0 *ISSUE 2: The funding, support, training and other resources available, including at a local and regional level, for:*

- *building capacity to adapt to climate change;*
- *specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure; and*
- *helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take.*

IMPROVING INSTITUTIONAL CAPACITY

4.1 The TCPA emphasises the scale of support, training and resources needed to enable the delivery of effective adaptation action. TCPA believes local authorities are best placed to lead on this. However current demand for experienced and skilled planners is increasing. This is in addition to planning resources are being absorbed by the preparation of local plans under new development planning processes. One of the first steps to ensuring the necessary capacity to deliver adaptive action through planning is having a sound policy framework in place. Recent research by TCPA in partnership with Cushman and Wakefield found that less than 15% of English local authorities have a sound core strategy with similar slow progress and/ or out of date development plans across Wales, Scotland and particularly Northern Ireland.

4.2 Furthermore, planners are expected to mediate competing priorities in a wide variety of areas including housing, economic development, transport and renewable energy planning, including embedding adaptation measures. The skills required of planners to be able to coherently communicate these priorities

³ Not printed. See *Helping to Deliver Climate Change Adaptation through the UK Planning System*, prepared by the Town and Country Planning Association, published August 2009.

is lacking. The Royal Town Planning Institute (RTPI), under its ‘Planning to Live with Climate Change’ initiative, promised to take appropriate action to ensure climate change skills will be part of the tertiary core curriculum for spatial planning as well as continuing professional development. The TCPA will increasingly commit its work programme to help raise awareness and profile of climate change skills and knowledge as indicated through our endorsement of the “Delivering Better Skills for Better Places” action plan led by the Housing and Communities Agency Academy.

4.3 It is vital that the planning system responds quickly to the risks posed by climate change. If the skills are not there, the role of planning in delivering adaptation is hampered. This is particularly relevant for adaptation measures, where negotiation, risk assessment skills, and effective communication will be required to affect change in development proposals. Generic and technical skills need updating, improving and adapting to deliver on climate change.

4.4 The TCPA highlights the following studies and inquiries which examined the capacity of professionals, in terms of skills and resources, and degree of effectiveness in addressing current and emerging challenges:

- Royal Institute of Chartered Surveyors, *Improving the Capacity of the Planning System in England and Wales: A View from the Regions*, March 2009.
- Communities and Local Government Committee, *Planning Matters—labour shortages and skills gaps*, July 2008.
- CAG Consultants, *Capability for Local Sustainability: Final Report*, Sustainable Development Commission/ Defra, May 2008.
- Audit Commission, *The planning system: Matching expectations and capacity*, February 2006.

NEW CLIMATE CHANGE TECHNICAL ADVICE BODY

4.5 TCPA has been leading a Planning and Climate Change Coalition to inform the CLG’s forthcoming draft revision of its Planning Policy Statement on Climate Change. The following extract from the emerging draft makes the case for a new streamlined technical advice body:

4.6 *A Climate Change Technical Advice Body (CCTAB)*

The need for proper evidence gathering and target setting requires tools and methodologies, and involves considerable complexity and skills.

4.7 There is a need for a new body which can supply the ‘heavy lift’ on evidence gathering, and provide a unified model for baseline conditions and target setting in relation to both mitigation and adaptation. The CCTAB would build upon the experience of other technical advice bodies for housing (NHPAU), waste and aggregates and draw on existing expertise from a range of agencies and organisations with a key role in the climate debate (Such as EA and UKCIP). It would provide a technical bridge between high level national climate requirements and detailed localised policy delivery. Above all it would provide a simpler and more certain process for regional and local policy making with a substantial efficiency and delivery gains.

4.8 *“CCTAB functions on mitigation and adaptation*

- *To provide strategic guidance to regional and local planning authorities on climate change. To provide a strategic technical bridge between the EU requirements, CCC and regional and local authorities.*
- *To provide agreed carbon assessment tools, provide assessments and set targets on mitigation and adaptation including making clear how differing carbon reduction regimes interrelate and the role of spatial planning.*
- *To understand energy capacity and constraints through agreed methodologies, and to map these in a way in which creates an agreed evidence base for development planning and site allocations.*
- *To ensure local authority and community aspirations on climate solutions are considered in capacity and constraint mapping.*
- *To provide strategic guidance on the risks and vulnerabilities of climate change and identify key adaptation priorities, particularly where these have both inter regional and sub regional dimensions.*
- *To act as a resource centre, providing reliable data and training to local authorities.*

4.9 The functions of the CCTAB do not remove the need for local data collection where LAs felt it was necessary to provide more detailed understanding of particular issues. It would, however provide a minimum standard of evidence to inform policy development. It would therefore ensure that the system was much better equipped to mediate between opposed interests based on a rational and considered view of opportunities and constraints.

4.10 It has been suggested that CCTAB should be a function of the Committee on Climate Change. This was primarily because of the need for logical and transparent linkage with national climate regime and because the committee sat above individual departments and had a greater opportunity to drive an integrated approach to climate solutions. However, this would require new guidance from Government and major change to remit and

skills of the CCC. Some members of coalition favoured other options such as CCTAB being a government office function. As result while the coalition was unanimous in the need for improved technical integration and standard sit did not reach a view as to who should host this body.”

BUILDING ADAPTIVE CAPACITY THROUGH POLICY AND OPERATIONAL MEASURES

4.11 Within the GRaBS project, building adaptive capacity is part of a process of working towards effective regional and local adaptive action. It is divided into two key areas: *policy measures* and *operational measures*:

- *Policy Measures*: adopt new or to strengthen existing strategic policies, which will provide the incentive and regulatory framework to encourage future development to incorporate climate change adaptation responses.
- *Operational Measures*: put in place new operational mechanisms that have the capacity to strengthen climate change adaptation responses. Examples of such measures include the establishment of a climate adaptation team in the organisation and/or climate change adaptation partnership with other stakeholders and the community.

4.12 The first expert paper of the GRaBS project championed the contributing role of the planning statutory framework in delivering adaptation through the various spatial scales of development and spatial plans (Henderson, 2009). This was first highlighted in TCPA’s *Climate Change Adaptation by Design* (Shaw, Colley and Connell, 2007), and *Biodiversity by Design* (TCPA, 2004).

4.13 The Committee should note that most studies into the delivery of climate change adaptation, as reviewed in the TCPA study for the RCEP, emphasised the lack of effective delivery such as issues with development plans, capacity and coordinated action while the necessary statutory and policy frameworks already exist and are relatively robust. This takes the focus back to improving capacity as highlighted in paragraphs 4.1 to 4.4.

4.14 The GRaBS project will also facilitate the much needed exchange of knowledge and experience and the actual transfer of good practice on climate change adaptation strategies to local and regional authorities among partners.

DELIVERING POSITIVE ADAPTATION ACTION THROUGH PLANNING MEASURES

4.15 As highlighted previously, the TCPA believes that planning, and the planning system, is vital in delivering adaptation action to enable necessary development while securing measures to improve built environment resilience.

4.16 At the development level, implementing adaptation measures through hard infrastructure to increase the resilience of the built environment can take several forms and at different scales. This ranges from region-wide green and blue (water) infrastructure network to the provision of local green spaces, gardens and permeable surfaces as part of development. Their provision in terms of planning to construction requires financing. Certainly local authorities cannot be expected to completely foot the bill for their provision if these effects are attributed directly to the proposed development. Therefore planning authorities are empowered to use planning obligations or developer contributions to legitimately secure financial or in-kind contributions from planning applicants:

- England and Wales: Section 106 of the Town and Country Planning Act 1990 and the Community Infrastructure Levy of Section 205 of the Planning Act 2008.
- Scotland: Section 75 of the Town and Country Planning (Scotland) Act 1997.
- Northern Ireland: Article 40 of the Planning (Northern Ireland) Order 1991.

4.17 Studies commissioned by the responsible government planning departments in England (Crook *et al*, 2006 & 2008), Wales (Rowley, 2007) and Scotland (McMaster, 2008) highlighted a wide-ranging use of planning obligations by planning authorities to finance infrastructure, including environmental infrastructure.⁴ They looked at variations in the ability of planning authorities to successfully secure contributions based on the method for calculating contributions, robustness of the local planning policy frameworks, and the degree of dedicated staff resources. Their findings indicate the primary justifications for those LPAs that are more able to secure contributions are due to clear policies in place and better experience in the process. Again, this takes the focus back to improving capacity to deliver robust policies and plans as highlighted in paragraphs 3.9 to 3.12.

4.18 The Community Infrastructure Levy (CIL) provides a significant opportunity to create a fair and transparent way of recovering value uplift created by the grant of planning permission. However we are concerned whether CIL will be properly directed towards tackling climate change by ensuring it can support wider adaptation measures in local communities.

⁴ For example in the study for England found that financial and in-kind contributions for open space rank relatively high on par with contributions towards transport and travel (Crook *et al*, August 2008, Chapter 3).

5.0 *ISSUE 3: The monitoring and evaluation of work on adaptation, including thoughts on how progress on adaptation can be quantified and success measured*

5.1 The TCPA believes it is right for the Committee to identify monitoring and evaluation as an important issue. It will increasingly become essential in delivering effective adaptation action through planning. Monitoring against indicators of how well adaptation is delivered through the planning system must be embedded in the existing processes of monitoring and review in plan-making as a statutory responsible of the relevant authorities of all UK nations with the exception of Northern Ireland :

- England: Regional Planning Body for the Regional Spatial Strategy,⁵ Mayor of London for the Spatial Development Strategy for London⁶ and Local Planning Authority for the Local Development Framework.⁷
- Wales: Welsh Assembly Government for the Wales Spatial Plan⁸ and Local Planning Authority for the Local Development Plan.⁹
- Scotland: Scottish Ministers for the National Planning Framework,¹⁰ the Strategic Development Planning Authority for Strategic Development Plan¹¹ and the Planning Authority for the Development Plan.¹²

5.2 TCPA accepts that unlike mitigation measures in energy generation and CO2 emissions, adaptation measures can be difficult to measure and do not enjoy a comparatively comprehensive set of datasets. However the TCPA believes that a picture of progress on, and opportunities for, adaptation action can be painted through examining indicators to report on policy and operational measures:

- *Inputs*: eg. time and financial resources.
- *Outputs*: eg. production of relevant plans and programs.
- *Outcomes*: eg. quantitative and qualitative surveys on specific aspects of adaptation action, organisation, processes, professional and citizen views.

5.3 These indicators can be formulated from publically available datasets related to the built environment's impact and contribution to climate change adaptation, including and not limited to:

- Local council annual report on corporate resources and activities.
- Biodiversity indicators from regional and local biodiversity action plans.
- Green infrastructure indicators from local open space strategies and studies, including green belt data.
- “Blue” infrastructure from the Environment Agency, strategic flood risk assessments and flood management plans.
- Development management and changing land use statistics from local authorities and collated by the responsible government department (England- Department for Communities and Local Government, Wales—Department for Environment, Sustainability and Housing, Scotland—Scottish Executive Planning Directorate, and Northern Ireland—The Planning Service).
- Other development statistics such as the number of development schemes with SUDs, use of developer contributions etc.

5.4 However there are serious issues with the consistency of data collection arrangements by the relevant local authorities as well as the relevance of indicators to policies.¹³ The TCPA recommends that further research be commissioned to establish a set of common indicators for measuring progress towards effective adaptation action.

5.5 In addition, The TCPA believes that the national indicator as part of the local authority's comprehensive area assessment framework in England, NI188, is a welcome step towards addressing the monitoring and evaluation issue highlighted by the Committee.

5.6 Finally, the Climate Change Act 2008's adaptation reporting duty is another important statutory mechanism to measuring progress within the planning and development system (see comments to ISSUE 1). However draft consultation proposals not to include regional and local planning authorities as adaptation reporting authorities in England is an indication that the Government does not fully appreciate the scale of impact developments can have on the resilience of the built environment and the potential contribution planning can have to increase this resilience.

⁵ Section 3 of the Planning and Compulsory Purchase Act 2004.

⁶ Section 340 of the Greater London Authority Act 1999.

⁷ Section 35 of the 2004 Act.

⁸ Section 60 of the 2004 Act.

⁹ Section 69 of the 2004 Act.

¹⁰ New Section 3A(6) to the Principal Act introduced by the Planning etc. (Scotland) Act 2006.

¹¹ New Section 4 (1) (b) to the Principal Act introduced by the 2006 Act.

¹² New Section 16 (1) (b) to the Principal Act introduced by the 2006 Act.

¹³ This issue was noted in the East Midlands Regional Plan Annual Monitoring Report 2007–08.

SUMMARY TRENDS IN CURRENT PLANNING STATISTICS RELEVANT TO ADAPTATION

5.7 Currently progress on adaptation can be measured and reported through the statutory requirements highlighted above, by examining the nature of planning statistics, particularly about collective decisions made on individual planning applications and the trend of changing land uses. This would provide the necessary link in assessing how adaptation has been properly filtered down from policy to implementation, aspirations to reality, spatial planning to developments on the ground.

5.8 Local authorities provide planning performance information to the relevant government departments and they are collated on a quarterly or half-yearly basis. TCPA found that the scope and availability of the statistics varies considerably from nation to nation. This may partly be due to full statistics not being analysed and published. This would have some impact on the effectiveness of monitoring progress through the spatial planning systems for the UK Adaptation programme and Adaptation Sub-Committee's work.

5.9 In undertaking a scoping review for the development statistics currently available, TCPA highlights key trends for England. Full outputs from this exercise are presented in Annex 3.

5.10 Changing patterns of land use of urban vacant and derelict land indicate a growing trend towards the intensification in the urban areas, in particular the increase in development on previous residential land use. While the redevelopment of previously open space and agricultural land have been steadily decreasing or stabilising, the primary concern is the proportion of minor development of less than 5 hectares (ie on urban back gardens and small plots of land) being redeveloped.

5.11 Without proper control of householder and minor developments through the removal of permitted development rights the incremental loss of urban backgardens will have a large impact. This will be greater than larger scale developments which go through a more rigorous environmental assessment and coherent masterplanning process.

5.12 TCPA believes an URGENT CALL for further detailed study of development statistics is required in the UK to fully comprehend their implications for adaptation action.

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Annex 3¹⁴

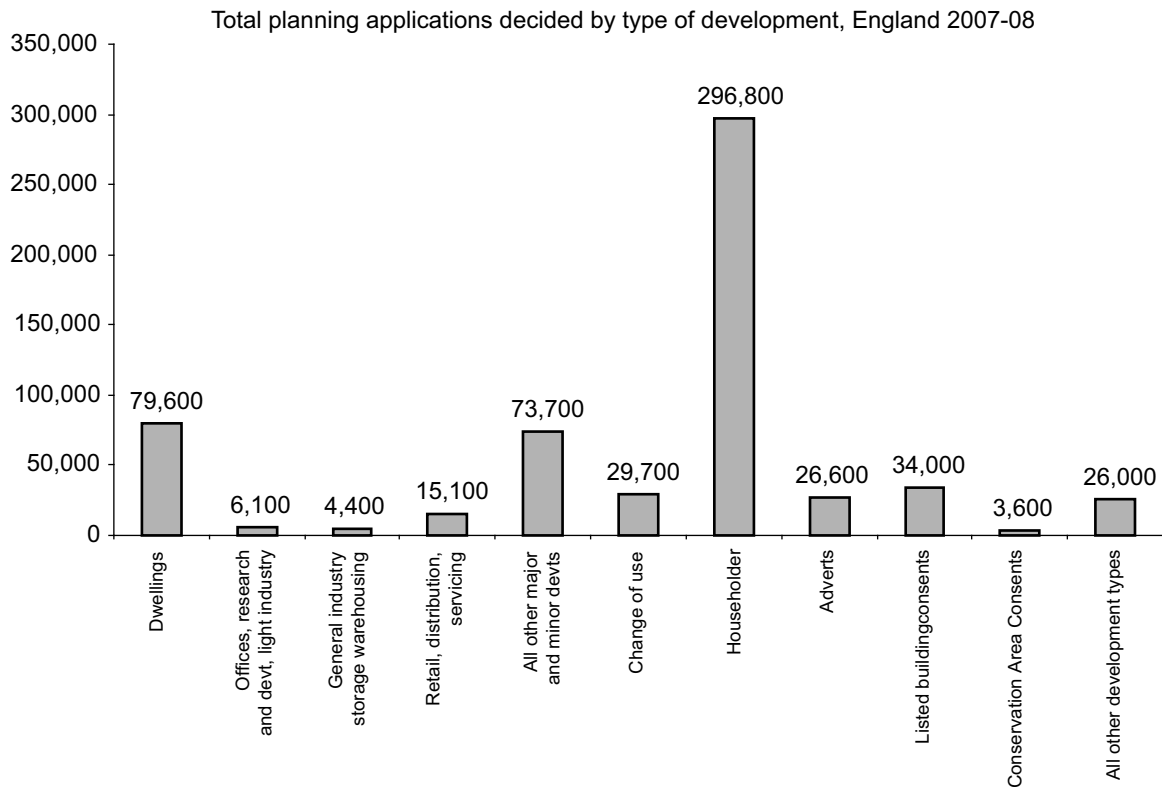
PLANNING STATISTICAL ANALYSIS FOR ADAPTATION ACTION

The TCPA has conducted a brief analysis of the most recent statistics available for land use and development management datasets for England and Wales. The range and depth of the statistics vary among the UK nations as there is no single UK source, and partly contributes to a lack of statistical evidence base for adaptation.

¹⁴ Annexes 1 and 2 not printed.

ENGLAND

As an illustration of the potential cumulative impact of development on adaptation, the TCPA examines the following development control statistics from the Department for Communities and Local Government.

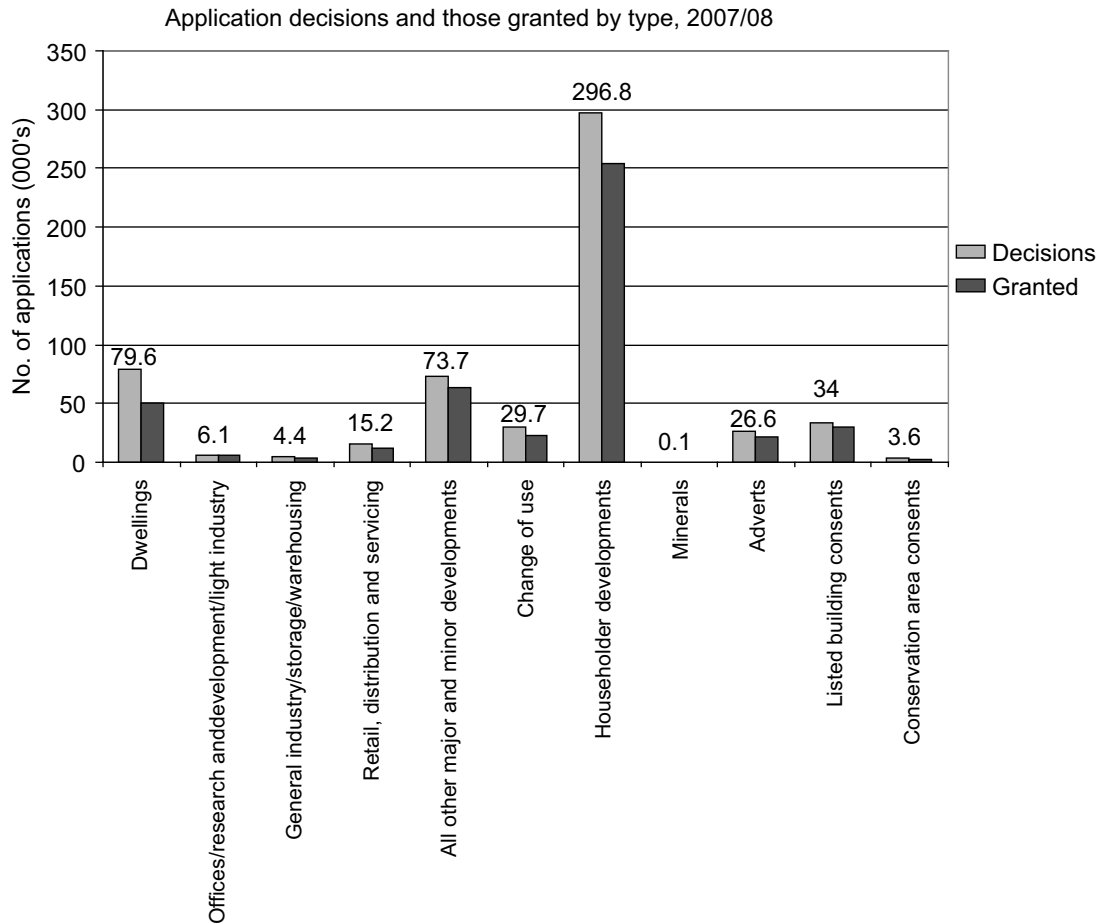
Figure 1

Data source: CLG, August 2008, Development Control Statistics, England, 2007–08, Table 1.6

Residential development is defined by Use Class C3 Of the Use Class Order 1987 as amended. Major is 10 or more dwellings, or where the number is not given a site area of a half-hectare or more. Minor excludes householder development and Change of Use.

Figure 1 above shows that householder planning applications are by far the largest category, with 296,800 applications decided in 2007–08. This is followed by applications for new dwellings, with 79,600 applications decided. Although the majority of these applications are minor, housing and residential development is the main land use activity of planning departments in terms of proportion of applications, and will have a major influence on construction and climate change.

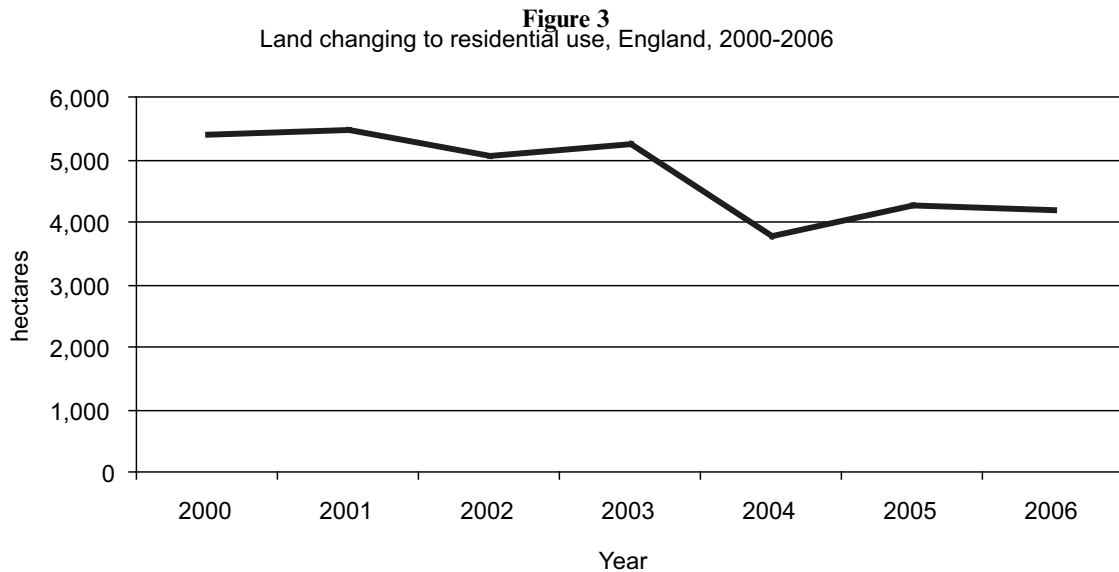
Figure 2



Data source: CLG, 2008, Development Control Statistics, England 2007/08, Table 1.4

Figure 2 shows that for the year ending March 2009, 4,420 planning applications for major residential developments were approved (65% of total applications decided), and 36,992 approved for minor residential developments in the same period (64% of total applications decided). The numbers of residential development applications being approved have fallen since the previous year, which saw 6,285 major and 44,144 minor residential applications approved. However, there were proportionally fewer minor applications decided in 2007–08, so producing a rise in the rate of approval of minor applications from 63% in 2007–08 to 64% in 2008–09.

Housing shortages, and subsequent increased house building and applications for development as already discussed, in England is creating changes in land use. The amount and type of land use change can be indicative of the level of sensitivity to sustainable development issues. Figure 3 below shows that the amount of land changing to residential use has generally experienced a decline since 2000.



Data source: CLG, July 2009, Land Use Change Statistics, Table P222

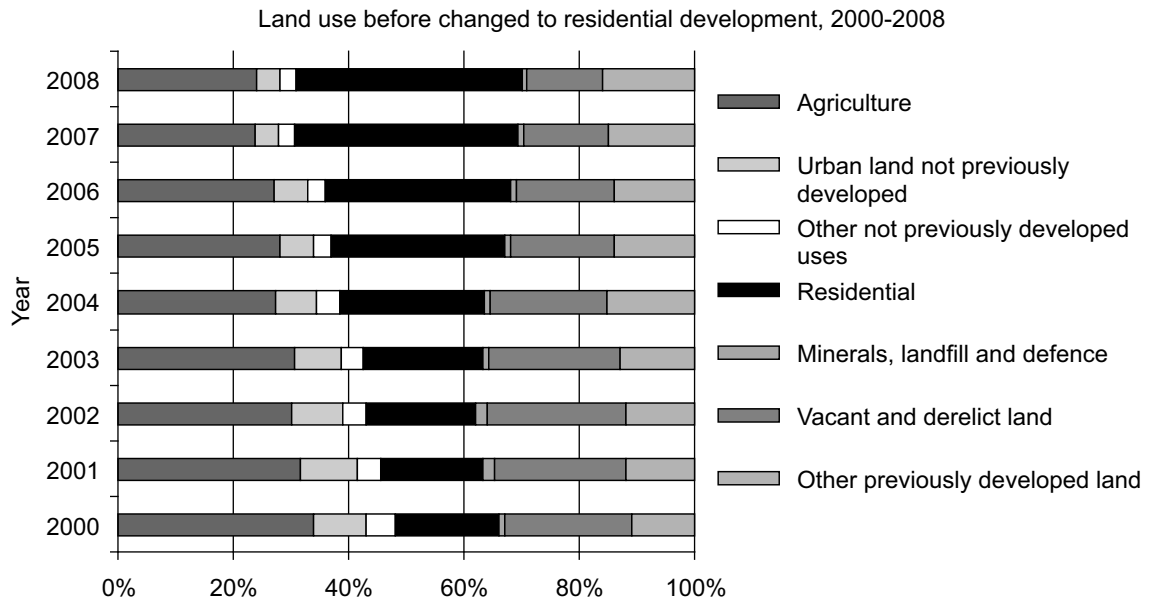
Between 2000 and 2003 dwelling density on previously developed land was 31 dph, rising to 47 dph between 2004 and 2007.¹⁵ For the same time periods, dwelling density on not previously developed land increased from 23 dph to 30 dph.

¹⁵ CLG, July 2009, Land Use Change Statistics, England, Table P223.

Figure 4 shows that in 2008 the majority of land changing use to accommodate new residential development was not originally residential. However, over recent years this amount has declined significantly, from only 18% of land in 2000 already residential in use, to 39% in 2008.

There has also been an increase in the amount of previously developed land (+17%) being changed to residential use between 2000 and 2008, and so a decline in the percentage of not previously developed land being used for residential development. Particularly of note is the decline in the amount of agricultural land changing use, from 34% in 2000 to 24% in 2008.

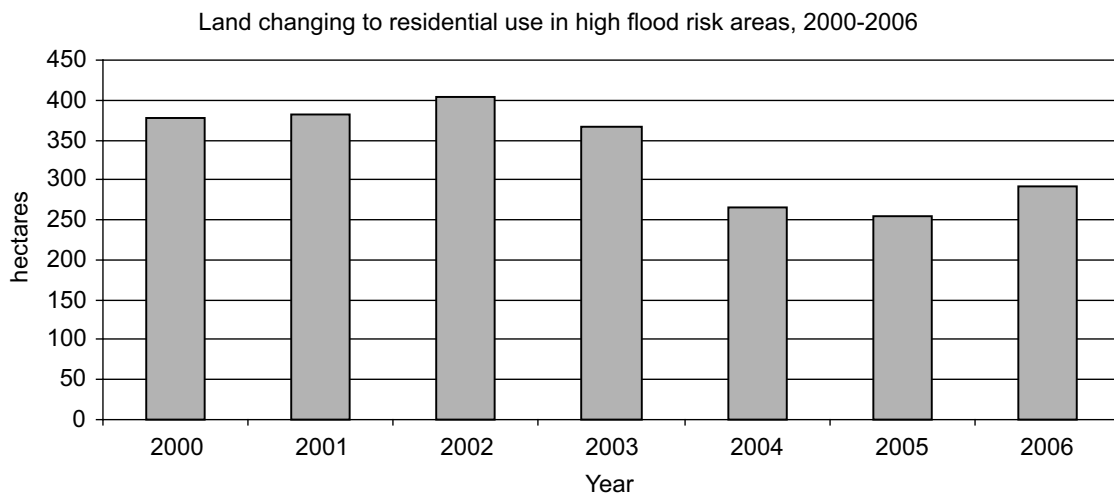
Figure 4



Data source: CLG, July 2009, Land Use Change Statistics, England, Table P226

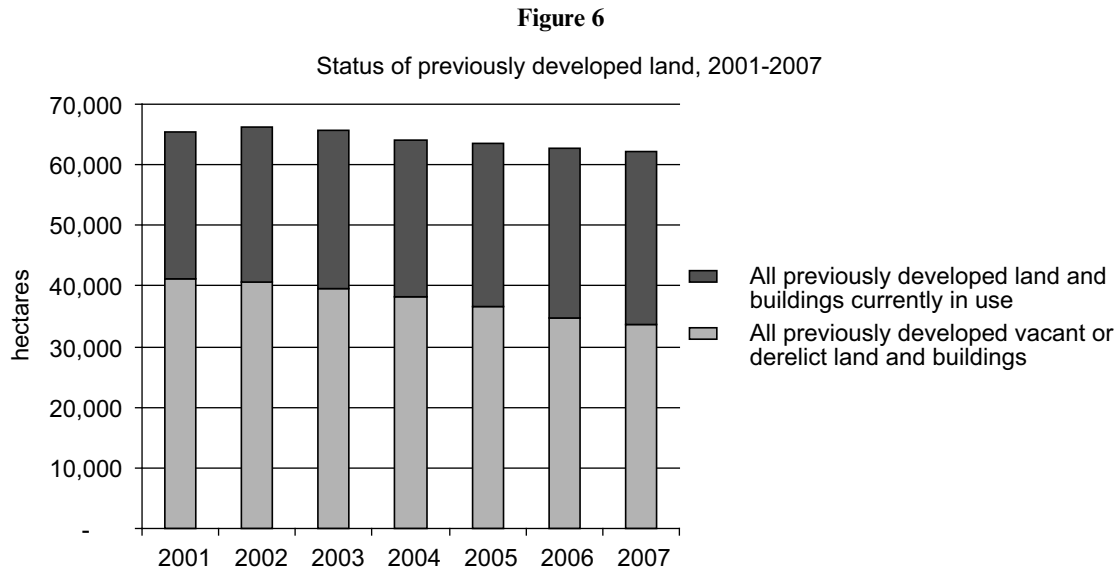
Figure 5 below shows a decline in flood risk land changing to residential land, from 404ha in 2002 to 256ha in 2005. However, the data begins to show a rise in land use change again, which may be the result of advances in flood management and house building techniques.

Figure 5



Data source: CLG, July 2009, Land Use Change Statistics, Tables P252 and P222

Previously developed land statistics are another indicator of sustainable development and ability to adapt to climate change. Figure 6 shows the overall amount of previously developed land available has declined between 2001 and 2007 from 65,500ha to 62,130ha, while the proportion of this land currently in use has increased.



Data source: CLG, October 2008, *Previously Developed Land that may be available for Development: England 2006 & 2007*, Table P301

The percentage figures of new dwellings built on designated green belt land over the past few years is also encouraging. A decline from 4% of new dwellings built on green belt land in 2000 to 2% of new dwellings in 2007 has occurred.¹⁶

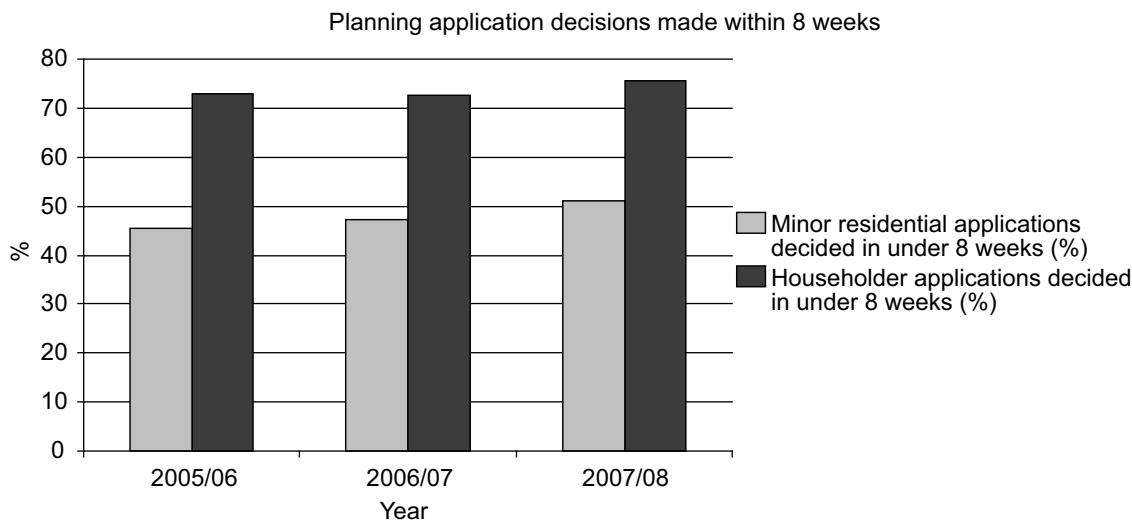
WALES

There is no data available for planning applications approved or for land use changes, to compare with data for England. However, there is data available on the number of planning applications decided, and the speed with which planning applications are determined. In 2007–08, a total of 34,243 planning applications were decided across Wales, 62.3% of which were decided within 8 weeks of being received.¹⁷

¹⁶ CLG, July 2009, *Land Use Change Statistics, England*, Table P241.

¹⁷ WAG, January 2009, *Development Control Quarterly Survey, January to March 2008*.

Figure 7



Data source: WAG, January 2009, Development Control Quarterly Surveys

Figure 7 above shows there has been an increase in the speed with which minor residential and householder applications have been determined over the past few years. However, this data does not tell us the numbers of applications approved and those rejected, and so while this may indicate improvements to applications, if many are being rejected it could mean that applications are not meeting the required standards.

2 October 2009

Witnesses: **Mr Gideon Amos OBE**, Chief Executive, and **Dr Hugh Ellis**, Chief Planner, Town and Country Planning Association, gave evidence.

Q101 Chairman: Good morning and thank you for coming in. You will have heard the previous evidence and, as I said earlier, we have got about half an hour to try and get through some of the key issues. Could I ask you to begin with what demands you think adaptation places on the planning system?

Mr Amos: I think there are two broad areas. Of course there are hundreds of areas of adaptation one could look at but there are two broad areas clearly where we need to adapt the environment. One is in terms of the increased temperature, particularly exemplified by the urban heat island effect, and the other is managing water in its broadest sense, so that is fluvial flooding, coastal change and weather-related rainfall flooding. Those are two very broad areas. Obviously one could expand a lot more on all the adaptation measures needed, and I suppose the main point I want to make in response to your question, Chairman, is that the planning system, if you take a decades-long perspective, actually is a huge lever to create major environmental change. You can look at regional parks such as the Lea Valley, you can look at green spaces throughout cities, the fact that hundreds of our houses, post-war, have gardens, all these changes to the landscape crucially have had planning behind them, and of course river catchment planning is another tool in that armoury. I suppose the benefit of an active and purposeful approach to planning is that over the long term these changes can be made and new

development can be used as a catalyst to try and retrofit the neighbouring neighbourhood at the same time. I suppose those are the kinds of changes we would like to see in the impacts of new development on existing towns and cities.

Q102 Chairman: So in that way the planning system is capable of helping the country adapt to climate change. Are there other ways in which the system itself needs to be modified to make that easier for planners to make a contribution?

Mr Amos: I think the most important thing for us is probably having a plan-led approach. There is a lot of evidence before you and Members about the need for strategies and the need for adaptation plans and green infrastructure strategies. None of these land-use changes is really going to take shape unless there is some sort of statutory plan-led process behind it. We regarded it as a huge step forward in 1990 when developments and planning applications became the subject of a plan-led approach. As it happens, just a brief point of history, Chairman, 100 years ago last Thursday Parliament got Royal Assent for the first Planning Act in the world which empowered local authorities for the first time to have development plans, 'Town Planning Schemes', and that unleashed a whole generation of garden cities and garden suburb-type development. We will return to the subject of gardens, but I think it just shows how

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important a plan-led approach is and how important it is that we do not lose that in the next few years of undoubted change in policy and legislation.

Q103 Chairman: On another point of history, the plan-led process you referred to in 1990 occurred when I was a Planning Minister.

Mr Amos: I was aware of that.

Q104 Colin Challen: You said that the planning system must be transformed if climate change is to be placed at the heart of decision-making. What is preventing this from happening at present?

Dr Ellis: There are some complex reasons and we touched on these in the coalition work we did producing a framework for a new PPS⁴ on climate change, but two or three top headlines would be political will, skills and culture, as perhaps the biggest driving force behind the difficulties that planning has to deliver. There are complexities in the structures of planning which we could probably sort out as well, but there are also complexities about the duties and priorities. One of the things that has to be addressed really carefully is what tasks we set the planning system to do. At the moment those tasks are confused and although there are critical duties in the 2004 and 2008 Acts on climate change, those duties are written in the weakest possible form, and so it is not surprising they do not necessarily drive transformational change. That means that local planners are conflicted about what they need to be doing. In our view, there is no greater challenge than climate change and the fact that we are not delivering anything like the way we should on the ground is scandalous and we need to sort it out, but that requires changes to skills and education and it requires changes to duties, and it requires changes to resources.

Q105 Colin Challen: Are we going to get a two-tier system where major infrastructure projects now of course have a separate planning route and then there is all the rest. Are there going to be any lessons learned when this really comes into force next year?

Dr Ellis: I do not think the two systems are well-related and there is already a fairly critical lesson there about the kind of narrative that we need from top to bottom on policy. There are the overarching principles of adaptation which are really well established. We know what we need to deliver mostly, but that kind of narrative is not clearly laid out. National policy statements are extremely controversial obviously and Parliament is examining them at the moment. The content on adaptation seems to me to be relatively good, but underneath that what we found is that the transformational PPS on climate change published in 2007 did not have that much effect on local government. Why did it not? Because even though the rhetoric was strong, it did not send a powerful enough signal to say that this is your first and foremost priority.

Q106 Colin Challen: Can you give me an example of that signal in terms of being able to translate it into concrete terms?

Dr Ellis: We have sent the planning system confused messages about priorities. We are talking about nothing less than the most significant transformation of the system post-War, and that requires very strong national prescriptive guidance. There is no other way forward because the amount of time we have left, given that we should have started adapting our cities a decade ago, is extremely short and that means that the overall national framework needs to set very clear guidance. We need to have national centres for knowledge which we talk about in our paper. It means that the profession needs to step up to the challenge through a very radical education programme. On top of all that you are talking about transforming local political leadership on climate change.

Q107 Colin Challen: I get the impression that perhaps we have conflicting PPSs, some advocating other priorities. Could you provide any examples of that, if you agree?

Dr Ellis: There is definitely a mixed message not between climate and housing but between climate and economic development. Economic development post-Stern should not be in conflict with dealing with climate change and a low-carbon economy, but I think in many local planners' minds, the traditional methods of economic development are taking precedence. That means that we are still engineering our cities and urban spaces to be problems for the future of climate change. We are not grasping overall nationally the need, for example, to consider the redistribution of population, which we are probably going to have to deal with if we do not get an agreement to limit temperature change below two degrees. That is the biggest conflict. Those things should be integrated. There is a huge opportunity to deliver a low-carbon economy but we have not managed somehow to grasp the opportunity yet.

Q108 Colin Challen: Should PPSs be so prescriptive that they prevent for example building new housing on floodplains?

Dr Ellis: There is still certainly some very disturbing practice given the risks of development on floodplains. I hasten to add that means that we then have to find sites for the housing we desperately need in other places, but the coalition document asks DCLG for a higher level of prescription for planning policy statements. To give you an example of the precise conflict, a planning policy statement's status in planning is defined only in case law, which is unhelpful. A national policy statement has clearly defined legal status for the new national framework. Those sorts of gaps and uncertainties could be resolved, but essentially this is not like any public policy-making that I have ever known. If we are to deal with climate change there has to be a level of clear central framework.

Q109 Colin Challen: You make these points; do you think the DCLG is listening?

⁴ Planning Policy Statement

Dr Ellis: Yes I do but I think there are barriers to them delivering on the ground. They can write what they like, but if local decision-makers and local practitioners are not skilled enough to deliver it and do not have the resources to deliver it and do not feel they have political support, then plainly that has little effect.

Q110 Chairman: You mentioned that you thought the draft national policy statements were quite helpful. Do you want to enlarge on that a little bit?

Mr Amos: Can I declare an interest, Chairman. I have accepted an appointment as an IPC⁵ commissioner so I am leaving all the questions on NPSs to my colleague.

Dr Ellis: The contents of section five of the overarching Energy NPS for example sets out what I regard as a reasonably straightforward, commonsense framework. You need to think about adaptation. It would be desirable if our new nuclear build was not within one metre of sea level, for example. However, there are difficulties I think—and this is a very important point—because the duties that exist on secretaries of state in the preparation of NPSs on climate to think about climate change have had some effect on adaptation and no effect on mitigation, which we are frankly terrified about, but the question is that those duties do not apply to the decision-maker, so there is no duty to think about climate change inside the IPC or placed upon the IPC. That means that there are big questions about whether or not the IPC has a sufficient skill-set (although of course there are some very talented people amongst the commissioners!) for example to interpret properly the UKCIP projections or the weather generator inside UKCIP to enable them to make a judgment about whether or not any of our infrastructure, our nuclear build, should be anywhere close to the North Sea, for example.

Q111 Chairman: Just on an example local to my constituency, to respond to the likely establishment of another nuclear power station at Sizewell and the definite establishment of offshore wind power, National Grid are proposing to upgrade the transmission capacity. They are doing that through the upgrade of their overhead power lines. Presumably, an adaptation strategy would encourage the burying of power lines rather than creating more overhead ones at a time when one of the certainties is bigger storms, higher winds and more violent conditions?

Dr Ellis: The IPC may very well conclude that but that is certainly what they would have to consider, absolutely.

Q112 Martin Horwood: I want to follow up on this. That is quite a major spanner in the works you are throwing in terms of the new nuclear build because almost all the sites are going to be based on existing power station sites which are almost all on the coastline.

Dr Ellis: Yes.

Q113 Martin Horwood: So you think there is a major problem with the whole nuclear new build plan?

Dr Ellis: There is undoubtedly a major problem. In TCPA⁶ in the climate unit we have three sets of science. We have the IPC, we have the mainstream generally, but if we take where the science is going on climate change and sea level rises, by mid-century, if we do not get an agreement in Copenhagen, then the maximum sea level rise, if we lose all the ice, is 22 metres.⁷ No-one is suggesting we get that necessarily by the end of the century but it does not seem sensible to have nuclear facilities with a lifetime of 150 years, 200 years post-decommissioning, anywhere near sea level.

Q114 Martin Horwood: This is moving back on to some of the comments you made about green infrastructure and the planning of green infrastructure. CABE⁸ in their evidence suggested that one of the problems was the lack of a clear national database of information about green infrastructure, and that it was not properly mapped. Do you think that there would be a benefit to planners in particular of having that database and having a very clear process of mapping and identifying green infrastructure?

Mr Amos: I think also one of the points CABE made about assessing the quality of green space is particularly important in terms of whether green infrastructure are delivering the adaptational benefits or not, because there is a whole variety, so having a database and knowledge in that whole area has got to be beneficial. The short answer is yes.

Q115 Martin Horwood: What would you include in that database? Would you include gardens and things like that?

Mr Amos: Absolutely and clearly the whole issue of back gardens is central to this whole debate. There has been a small move forward with regulation to require planning permission before paving over front gardens but we did not make the same advance on back gardens and obviously with the classification of back gardens as previously developed land, and therefore brownfield land, the quantity of building on back gardens has to be a serious concern given that 60% of new housing is meant to be on brownfield. A huge amount of that could be impacting on gardens. The way the data is collected at the moment means that you cannot easily get at those figures. There is data on the quantity of development on existing residential land, and that is the closest you can get to an estimate of how much of that is garden land. It is a very difficult issue. Obviously the Mayor of London has been

⁶ Town and Country Planning Association.

⁷ Note from witness: These comments on the prospect of a much higher sea level rise than government predictions are based on a paper by Jim Hansen, "Scientific reticence and sea level rise", published on 24 May 2007.

⁸ Commission for Architecture and the Built Environment

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grappling with this as well. However, it must be central to value urban green space, and green space close to where people live, very highly in our planning processes, if we are concerned about adaptation, and the current system, partly because of the data gathering, does not do that.

Q116 Martin Horwood: Can I just ask you about definitions. You said “urban green space” but you also said “green space close to where people live”. I want to ask a specific question which is about some work that the old Countryside Agency did before it was abolished talking about “green space on the urban fringe”, which is often some of the most volcanically contentious in planning terms because developers love it and local people obviously want to protect it. Do you think that urban fringe countryside should also be counted as part of that urban green space and identified and mapped and protected in that way?

Mr Amos: Obviously we have pretty tough green belt policy to protect that urban fringe if that is the objective. I think for the adaptation debate what is particularly important is the fact that, as the Manchester research shows, a 10% decrease in green cover can mean a seven degree Celsius change in temperature. That is a massive change in temperature. It does not matter so much whether you are living on the urban fringe or right in the centre of an urban area or in the middle of suburban London, the important thing is to have that green cover and those green spaces integrated with the way people are living and where the housing and development is. I would suggest it is of the same value whether it is on the urban fringe or further in and we need to integrate these two much more closely.

Q117 Martin Horwood: Groundwork UK suggested that all local authorities should be required to prepare a green infrastructure strategy as part of their LDF? What do you think of that?

Mr Amos: I think having an LDF would probably be the first step in that direction.

Q118 Martin Horwood: Do you think it is logical to do it on a local authority level or do you think, given what we know about the landscape and catchment areas, that these landscape policies need to be on a larger scale?

Mr Amos: Exactly. Obviously there are some questions that can be dealt with entirely locally but there are also huge issues that need to be dealt with at a strategic level. Earlier with the previous witness you were mentioning river catchment planning, which obviously crosses local authority boundaries. We are concerned about rumblings of a move away from any kind of strategic or regional planning given that these problems are not local. We accept that the environmental debate is international, do we not, and we accept that these things need to be tackled over international boundaries. We need to recognise that when it gets down to a UK level, and an

England level, some of these problems also breach, believe it or not, local authority boundaries. We are going to have to have solutions. Those may be new solutions on regional planning or sub-regional planning, different structures, different governance and so forth, but we need to have a strategic overview.

Q119 Martin Horwood: Can I ask you about one specific sentence in your submission as well. In talking about the 60% re-use of brownfield land for redevelopment target, you said: “Regional Spatial Strategies and Local Development Frameworks have used this target to encourage urban regeneration and discourage potentially sustainable greenfield developments, rather than considering the benefits of proactive planning and re-use of brownfield and greenfield land to form a network of green infrastructure to contribute towards adaptation.”⁹ It is quite clear what the benefits of the proactive planning approach are for urban areas, but are you actually saying that local authorities could benefit the environment by proactively planning greenfield sites as well?

Mr Amos: We are not suggesting that every single application would be better done on greenfield land—that would be quite wrong—but I think it does fall to us to speak up for the point that there are occasions where a greenfield location, particularly some which are very heavily farmed with perhaps high levels of chemicals, very poor biodiversity, perhaps neighbouring brownfield sites, could be part of a development that actually brings about environmental improvement through development. The RSPB has done a lot of work about biodiversity in urban gardens. Some of these options do come up, especially if public transport is also excellent perhaps around a country station. The important thing is that we are very happy to support the 60% brownfield target, but it is important to recognise that there are opportunities to do highly sustainable developments which improve the natural environment through development, on occasion, and it is not as simple as saying greenfield will always be bad.

Q120 Mark Lazarowicz: In your submissions you say that there is a need for “a step change in the skills and education of decision-makers, both political and professional, in local and regional government.”¹⁰ What evidence is there of a coherent strategy for delivering a step change in the skills of planners? Is the necessary training available or does it need to be put in place?

Dr Ellis: There is no doubt progress and the RTP1¹¹ have announced progress in the education of planners. I think given the scale of the challenge I keep coming back to these words “transformational change”. That is not just about young planners being trained on climate, which needs to be

⁹ Ev 52

¹⁰ Ev 50

¹¹ Royal Town Planning Institute

mainstreamed much more centrally, but it is also about continuing professional development. You almost need to take the profession out for a month and re-skill them on climate change. When you look at some of the statistics that are quoted in our submission from the Arup study about the number of planning applications in authorities that go through the system with no consideration of climate change or adaptation at all, it is frightening. There is also the interface between professional planners and particularly between elected members and their training. Our experience of that is difficult because there are some fantastic elected members out there prioritising climate change, but there is also a significant body of elected members who remain climate deniers, which is very difficult.

Q121 Mark Lazarowicz: Should central government be doing anything to help address the skills gap?

Dr Ellis: Absolutely they should. They need to put as much pressure as possible on the profession to evolve and change and re-skill itself. That is partly about resources. Some of that is pointing in the right direction. In terms of communicating key strategies, to give one example, it would be the renewable energy strategy, so a programme of communicating that to both professionals and to elected members is absolutely critical if we are going to get the right kind of renewable energy, and the same applies to adaptation.

Q122 Mark Lazarowicz: Can local government do more to either improve skills within a particular local authority or even the climate of opinion or understanding amongst local planners and local communities, for example?

Dr Ellis: I certainly think it is beginning to happen, but the problem we have got is that it is driven by events rather than driven by strategy, so we have the North West, we have had floods elsewhere and we now have increasing awareness in the profession about the allocation of housing in extremely vulnerable areas to flood. We need to be more strategic about that. That does require a big programme of public communication, I guess, to make this work.

Q123 Mark Lazarowicz: I was interested in what you were saying about a lot of local councillors denying climate change. Are they denying climate change is happening or do they just not think it is that important?

Dr Ellis: When you seek to pursue climate through the energy route—I have been roasted many a time, probably fairly, at events on renewable energy, particularly onshore wind, so where you approach the climate debate from that perspective there is tremendous resistance, perhaps for understandable reasons. There simply is not the grasp of the scale and urgency and there simply is not the accessible science or information. One critical example of that is that UKCIP does a fantastic job but the way that they have conveyed risk and probability through

their findings is not one that is easily understood, so what they are saying is should you pick a 50/50 risk of a major event happening or an 80% risk of it happening, and that kind of probability does not work. What people need at the local level is, as the previous witness said very well I think, a clear scenario about what will happen in their community and then people can coalesce around that.

Mr Amos: Could I add very briefly that we are leading a European project to provide the skills and methodology to produce Adaptation Action Plans which would then do exactly as Hugh says: identify what the changes are in the particular area and how then you respond to those through adaptation measures in development plans.

Q124 Chairman: You have advocated a Climate Change Technical Advice Body. Why on earth do we need yet another organisation?

Dr Ellis: A coalition of 60 organisations came up with that idea. I was very struck, given that there is a huge presumption not to have another body and yet more complexity, about the massive consensus there was around that. That is because there needs to be, as I have just described, a body at sub-national level really, providing local authorities with a trusted source of information. There are two dimensions to it which are important. The first is that we must not have adaptation organisations split off from mitigation because strategising about both resolves the conflicts that exist between them. Some mitigation strategies will conflict with adaptation strategies. Unless that is done and the methodologies and data are collected by one body, there is a horrible risk of conflict between the two ideas. The CCTAB¹² idea was not simply to re-create organisations but to pool the information in an accessible form. It is interesting for example that although the Environment Agency and UKCIP work well together, I am sure, there is no formal agreement between the organisations and there is significant uncertainty amongst local decision-makers about what each organisation's remit might be. That is replicated in mitigation, particularly in relation to information on energy for example. The idea of the CCTAB is essentially a laboratory. It is not a political body, if you like, but a laboratory where you can access—and the phrase has been used—in a one-stop shop everything you need to know to come up with a decent climate response in a local authority area. There is a fairly desperate need for that, although little sign that it will appear, because the greatest sin of all in responding to climate change is the fact that most local decision-makers do not know where to access critical information that would really transform communities.

Q125 Chairman: If we accept there is a case for this body, who will pay for it?

Dr Ellis: I have two responses to that. The first one is we did not work out who would pay for it. We hoped that it would sit within the regional planning

¹² Climate Change Technical Advice Body

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function and obviously there is debate about where the regional planning function might go. There are other bodies and other examples of how that is done, in relation to aggregates planning for example, where it is dealt with in a similar way, so we were not thinking of creating an entirely new structure. It sits within the regional planning function, but the other side of that coin, which is reflected by Stern and the Manchester mini Stern,¹³ is simply the cost of not having an effective response to climate change, which seems to be so appalling and so extreme. I do not mind if we go down and lose the argument on climate change for good reasons but losing the argument on climate change because we could not find the data does seem to be too appalling a prospect to contemplate.

Q126 Martin Horwood: Lots of the issues we have talked about today touch on areas outside of planning. We have talked about energy and water management and things like that, and you could add in transport and health. The only body that exists to co-ordinate the response to adaptation at the moment is the Government's Adapting to Climate Change Programme. Do you think that has the necessary resources and clout to actually bring all these different people together and make them work together in a co-ordinated way?

Dr Ellis: All I can say is that I do not see it happening at the moment. I would suspect that the departmental split on responsibilities for climate change will probably have to be considered very carefully. There is certainly a need for a strong unity of purpose between the three departments with responsibilities on climate change, in particular the relationship between Defra and DCLG. I am not suggesting they do not work well with each other but it is in the nature of departmental conflicts that we do not have time for any kind of uncertainty. Let me apply this test: are we driving towards adaptation in urban and rural areas effectively enough to avoid significant damage to civil society and the economy? No, absolutely not. What that will require is a much more unified approach, centrally, to dealing with adaptation and much more resource.

Q127 Chairman: What can the planning statistics tell us about how current buildings are being improved?

Mr Amos: I covered this in one of my earlier answers, Chairman. Actually it does not tell us an awful lot. One of the crucial issues that we have already pointed to is how much development is going on in urban gardens, and the figures do not tell us that specifically. There are all sorts of other things the data do not tell us. For example, planning permissions are not monitored so we do not know how many permissions are out there. We know there are a number of decisions but we do not know what permissions have been granted, so the debate about

the effectiveness of planning and adaptation and a whole range of other areas is somewhat obfuscated by that. I guess we are really arguing, particularly with regard to development of green space, that there might always be important development impacts on flooding, water management patterns, those kinds of impacts of development which we need to be gathering some data on, and we are not at the moment.

Q128 Chairman: What is the cost of doing that?

Mr Amos: When the TCPA is large enough to have a huge financial department we could estimate the cost, but I am afraid we have not got that far in our submission, Chairman.

Q129 Mark Lazarowicz: As you well know, 80% of the buildings that will be around in 2015 have already been built. Does the Government have a coherent approach to encouraging the adaptation of existing buildings and what should the Government be doing to encourage owners of those builders to do so?

Mr Amos: One of the interesting things about planning is that when it comes to climate the whole area is going to change. It does not actually matter whether it is an area zoned for development. The whole country is going to be subject to a change in temperature and other changes, so environmental change will be happening across existing urban built-up areas and sites of new development, so to answer your question I think that we need to be seizing the opportunities that new development offer to retrofit existing neighbourhoods. We also of course need retrofitting of existing neighbourhoods even where there is no new development, and that might be regeneration schemes. Ironically, it could be the case—and Hugh referred to movements of population earlier—that large amounts of our housing stock become pretty much untenable, for example very small flats in highly dense urban areas with a heat island effect, with insufficient ventilation, these kinds of units may need to be replaced on a fairly large scale, so ironically there may be an even greater need for development and redevelopment of existing neighbourhoods as well as retrofitting of the buildings one keeps.

Dr Ellis: There is a priority in terms of section 106 or CIL¹⁴ money that is generated through planning, particularly on the social justice aspect of that, because some of the scenarios the University of Manchester are generating for where Manchester city might end up are already indicating that the urban heat island effect is much more severe and will have a much more lasting effect on populations who are least able to adapt to it. If there was prioritisation about the retrofitting it would certainly be in that direction.

Q130 Chairman: Do you think there is an opportunity to encourage both retrofit but also in the case of new build better environmental standards by offering people concessions in the planning

¹³ Deloitte MCS Ltd, "Mini-Stern for Manchester: Assessing the economic impact of EU and UK climate change policy on Manchester City Region and the North West, September 2008

¹⁴ Community Infrastructure Levy

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system? One of the perennial complaints is the delays that are incurred by developers. If there was a fast track offered for schemes which achieved higher environmental standards, would that be appropriate?

Mr Amos: Do you mean like eco-towns, Chairman?

Q131 Chairman: There are all sorts of other problems associated with that but someone who is trying to get permission to put up a dozen houses on the edge of a village, it might take him two or three years to get through the process. If it could be given in two or three months by saying these will be zero-emissions houses, would that be a good idea?

Mr Amos: I mention eco-towns partly in jest, but it was an attempt to do something quickly in terms of an exemplar. It ran into some problems, although now the local authorities are very supportive. I suppose there is always a danger of setting up a special procedure in planning for a special kind of development. My stock answer would be that if it is such an excellent development, it should be getting

permission straight away anyway, it should be meeting all the policies and standards, so it should be fast-tracked. Why that is not happening is another question. I do not know if my colleague wants to add anything.

Dr Ellis: Absolutely. I would also highlight one of the recommendations in the coalition document which is about climate change being the first amongst equals of material considerations. At the moment climate change is so novel I have yet to see a planning application refused because of its climate impact, even now, which is again fairly disastrous. If climate change was raised up as one of the critical considerations, then in theory that would solve that problem because developers coming along being able to meet that high standard on climate change would find their pathway through the planning system much easier.

Chairman: I think we have probably come to the end of our time. Thank you very much for coming. Climate is a very crucial aspect to all of this so we are grateful to you for your evidence.

Tuesday 5 January 2010

Members present

Mr Tim Yeo, in the Chair

Mark Lazarowicz
Jo Swinson

Dr Desmond Turner

Memorandum submitted by the Office of the Mayor of London

SUMMARY

This submission provides a summary of the issues as perceived by the GLA. The GLA would be pleased to expand on any of the points made by providing oral evidence to the Committee.

This summary highlights the following issues:

1. Government could and should take a more consistent approach to adaptation, both within its policies and in leading by example.
2. Government could and should do more to ensure that public expenditure further enables adaptation.
3. Government could and should expand its focus on adaptation to enable and deliver adaptation in existing buildings.
4. The regulation of the water industry needs to evolve to deliver more sustainable approaches to long-term issues, such as climate change.
5. The need for greater capacity and skills, particularly at the local level effectively to deliver adaptation.

CONTEXT

- The Mayor of London welcomes the opportunity to feed into the Environment Audit Committee's inquiry into climate change adaptation. Tackling climate change (adaptation and mitigation) is one of the Mayor's top priorities.
- The Mayor is developing a Climate Change Adaptation Strategy for London. The aim of the Strategy is to help prepare London and Londoners for the impact of climate change and extreme weather. The Strategy identifies the risks and opportunities presented by extreme weather today, and then uses the UKCP09 climate projections to project how these risks and opportunities will change in the future, or bring new risks and opportunities to London. The strategy also identifies the key actions necessary to manage these risks, or to realise the opportunities, and provides a framework for the Mayor to work with partners to achieve.
- The draft London Climate Change Adaptation Strategy identifies that London is already at risk of floods, droughts and heat waves, and that climate change will increase the frequency and intensity of these impacts, so increasing the risk to London, Londoners and the national economy. The next draft of the London Climate Change Adaptation Strategy will be published for public consultation by the end of the year.
- The Greater London Authority Act 2007 commits the Mayor and London Assembly to a "climate change duty", where the Mayor and London Assembly must mainstream climate change adaptation across their plans and strategies, and the Mayor must publish and regularly review a climate change adaptation strategy for London.
- In addition, the Greater London Authority is proposed for reporting under the Climate Change Act 2008 as one of the "priority reporting authorities". The Mayor will consult the London Development Agency and Transport for London in developing the report to Government.

1. ENSURING A CONSISTENT APPROACH ACROSS GOVERNMENT

1.1 The Mayor welcomes the work being done by the DEFRA Adaptation to Climate Change Programme in undertaking the national Climate Change Risk Assessment and in supporting Government Departments identifying the climate risks and opportunities facing their assets and operations. However, it is also essential that all Government Departments and non-departmental public bodies drive a coherent and seamless adaptation message through their policies, projects and guidance. The Mayor is concerned that Government could and should do more to ensure this consistent approach to adaptation. The following highlights gaps and inconsistencies:

1.2 *Example:* Communities and Local Government launched the “Green Changing Rooms” initiative to reduce carbon emissions from existing housing stock in Feb 2009. So far, there has been no inclusion of water efficiency, or any other basic sustainability improvement, which would add value to the programme and deliver adaptation measures in parallel with mitigation measures.

1.3 *Example:* the Energy Performance Certificate for buildings does not take account of water use, and therefore misses the opportunity to reinforce the link between water and energy efficiency. A good example to follow would be the National Australian Built Environment Rating System (NABERS), which measures and displays energy use, water use and waste generation. www.nabers.com.au/

1.4 *Example:* Currently Building Regulations and even the Code for Sustainable Homes (the Code) do not require developers to consider overheating risk, and even best practice recommendations suggest that buildings are designed for the summer of 1983—only a modestly warm summer by this decade’s example and comparatively cool by future projections. (The GLA and CIBSE are jointly producing a series of future hourly summer temperature projections that can be used by architects and engineers in building simulation software to manage the risk of overheating risk in the future.)

1.5 *Example:* The Code sets water use targets for new residential development. The water use is calculated using a “Water Calculation Tool” (the Tool) which makes assumptions about how many times and how long inhabitants use various water-consuming devices. Developers have to use the Tool in order to demonstrate compliance with the Code. The application of the Tool, however, can lead to developers installing inappropriate technologies or devices that do not deliver real water efficiency, hence using the Code in urban development may be having the reverse effect. The GLA recommends that the a simple fittings-based approach that promotes water efficiency based on approved flow rates and volumes, eg AECB Water Standards (see link) should be considered in place of the Water Calculation Tool. This simple method could also be transferable to future Codes on Sustainable Refurbishment or Sustainable Buildings. www.aecb.net/PDFs/waterstandards/1503_AECB_Water_Vol_1_V3.pdf

1.6 *Example:* Overheating risk in social housing is driving social housing landlords to fit or provide air-conditioners rather than invest in “passive” measures (shutters, awnings, blinds, etc) to reduce the risk of overheating.

2. ENSURE THAT PUBLIC EXPENDITURE FURTHER ENABLES ADAPTATION

2.1 The Mayor believes that Government should ensure that public expenditure should encourage and enable adaptation : too much public funding is still spent on programmes and projects that do not consider the future climate. Adaptation in public buildings should by now be common practice rather than best practice.

2.2 *Example:* The DoH guidance on the design of new hospitals does not require hospitals to be designed to stay cool in hot weather, yet we have experienced three heat waves this decade.

2.3 *Example:* OfWat instructed water companies that any investment in adaptation measures proposed in the current round of business plans, based on UKCIP02 climate projections would not be supported. This means that very little adaptation of the water utility infrastructure will occur in this round of business planning, and expensive retro-fits may be required at a later date. Given that the UKCIP09 projections are not significantly different to the UKCIP02 projections, this would seem to be counter-productive, especially as the water industry is one of the sectors leading on adaptation.

3. ENABLE AND DELIVER ADAPTATION IN EXISTING BUILDINGS

3.1 The Mayor believes that Government needs to take more serious consideration on how to adapt the existing building stock. Existing development represents 99% of all development and retro-fitting existing buildings needs to be a Government priority. An integrated retro-fit approach that considers for energy and water efficiency, plus improving resilience, is urgently required.

3.2 Government should remove the economic barriers currently restricting sustainable and innovative technologies that improve efficiency and resilience. This includes encouraging retro-fitting of residential developments with the preferred water and energy efficient devices, through reducing the VAT on measures that increase resilience and water efficiency.

3.3 Government could help lever in greater public and private sector funding into adaptation and sustainability delivery by creating a fund to enable regions to undertake large-scale retro-fitting work. This could be integrated into CERT and Government refurbishment targets, such as the Green Changing Rooms programme.

3.4 The Government should lead by example and accelerate the retro-fitting of all government and public buildings, and ensure that adaptation measures are included.

3.5 *Example:* the Government’s “Decent Homes Standard” for social housing renewal, needs to be updated to include water efficiency, overheating resilience and, where required, flood risk management options. The GLA has published research, “Towards a successor standard to Decent Homes” that looks at how environmental standards of existing social housing can be improved when being refurbished. www.london.gov.uk/mayor/publications/2009/docs/decent-homes-successor-standard.pdf

4. REGULATION OF THE WATER INDUSTRY

4.1 The regulatory framework for the water industry needs to evolve to give greater consideration of the longer term, and drive the delivery of more sustainable solutions. In particular, water companies need to be required to, and benefit from, reducing demand for water.

4.2 Water companies are required to justify the interventions proposed in their business plans by demonstrating cost effectiveness to OfWat. The calculation of this cost- effectiveness seems to encourage shorter-term solutions and the development of large fixed assets (such as reservoirs) rather than more “diffuse” solutions, such as metering and enabling greater domestic water efficiency.

4.3 *Example:* Water companies are only permitted to reduce leakage from their mains pipes to a point defined as the “economical level of leakage”. This is the point where it is considered “more economical” to find, or create new water resources rather than invest in further leakage reduction. The cost effectiveness calculation does not adequately take account of the message this sends to the public regarding water efficiency—in effect it is asking the public to be water efficient where the water companies are not, or the damage that the abstraction of this water from the environment causes in the first place.

4.4 *Example:* Water companies have set themselves a voluntary water efficiency target of saving 1 litre per household per day, rather than face a mandatory imposed target. In a region that is “seriously water stressed” (meaning that the amount of water we withdraw from the environment causes actual damage to the environment), this voluntary target is too low to enable the step change required. We need to work towards a goal where demand for water reduces at a rate greater than climate change reduces supply.

5. INCREASING CAPACITY TO ADAPT

5.1 Despite the intense resource pressures on all of the public sector at the moment, there is immense value in even a small amount of capacity within public institutions to raise the profile of adaptation and to make it relevant to each institution. Without having an internal capacity to challenge an organisation, and to present adaptation to its own decision makers in meaningful terms, it is likely that adaptation will be brushed off as being unimportant or trivial or, even worse, as having been “done”.

5.2 The majority of adaptation actions are best delivered at the local level. However, many Local Authorities do not have the capacity to assess climate risks and undertake adaptation work. One option would be to create and enable networks between Local Authorities where expertise can be called on across Borough boundaries.

5.3 *Example:* There is a need to raise the public’s awareness of the climate risks they face and to encourage the public to “own” these risks and understand that in case of an emergency situation, the state response will be to target the most critical assets and the most vulnerable in the community. In London, fewer than 1 in 5 households at flood risk has signed up to the Environment Agency’s free Floodline Warnings Direct service, which can provide essential time for people to take action to reduce the impact of a flood on their homes. Government at all levels should do more to encourage the public at risk to register for this service—perhaps this should be included as a requirement for achieving higher levels on the local government performance indicator on adaptation (NI188).

5.4 *Example:* The National Heat wave Plan relies on GPs identifying “vulnerable” people within their practices and ensuring that these people are informed of what they can do during a heat wave to reduce the risk of overheating. However, many GPs have not compiled a list of vulnerable people and vulnerability to climate impacts is not constant (for example it may depend upon how that person is feeling on that day, or whether their carer is present on that day). Furthermore, many vulnerable people do not perceive themselves as “vulnerable”, and hence are unlikely to pay any attention to the information, should they receive it. The solution to this issue (which also helps to manage flood risk) is to enable a community spirit and build community capacity, so that trusted residents look out for vulnerable people and assist them when necessary.

28 October 2009

Witnesses: **Ms Isabel Dedring**, Mayoral Adviser on the Environment, and **Mr Alex Nickson**, Climate Change Manager (Adaptation), Greater London Authority, gave evidence.

Q132 Chairman: Good afternoon and welcome to the Committee. Sorry we are a few minutes late in starting. We are slightly short today because this meeting clashes with a statement in the chamber by Ed Miliband and some of our colleagues are there.

At least one of them, I think, will join us during the course of the evidence. Isabel, it is a bit of a marathon session for you. I do not think we have ever had the same witness dealing with two completely different inquiries, but I think it is

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convenient from your point of view and it is quite convenient from ours because these are successive subjects that we are dealing with.

Ms Dedring: I just wanted to say thank you very much for having us consecutively because I know that is unusual.

Q133 Chairman: It is, but it is fine. Thank you for coming in. I do not know if you want to make any opening statement or shall I just crack on with some questions?

Ms Dedring: Yes, that sounds good.

Q134 Chairman: We are dealing with adaptation first because we are towards the end of our evidence taking on that. We are not quite at the end of it, we have got Hilary Benn coming in later in the month, but we are towards the end of it. Do you want to say how big an impact you think climate change is going to have on the way Londoners live and how soon that impact will be felt?

Ms Dedring: You will have seen the UK Climate Projections that recently came out and those numbers for London are not completely out of line with what we thought previously. They have been revised slightly, but directionally they are the same. It is quite a significant impact in terms of averages often obscure some of the variation around an average. I guess our general view is that impact, which we already knew was going to be significant, unfortunately will be very significant unless we start to move out of the analytical phase and into a delivery phase. For example, in 2050 80% of the buildings that are here today are going to be here still in 2050, so having eco-build for new buildings is important but retrofitting London's existing building stock is very important as well. Our general view is that we are trying to shift into a phase of continuing to understand things better, but at the same time moving towards a delivery of programmes like large-scale rollout of water efficiency measures, trying to prevent overheating and adapting to drought, again on the ground rather than simply analysing what the impacts are going to be for London overall.

Q135 Chairman: I would like to come back to buildings in a bit more detail in a moment. Just looking at it from a business point of view, it is quite topical to see how London is going to fare business-wise in light of the recession and possible tax changes and so on. What do you think the implications and the opportunities, indeed, from climate change are for businesses in London?

Ms Dedring: The big emphasis for me is London is possibly the financial services centre in the world and certainly a major financial services centre. The discussion on the adaptation front has not moved on as far as it has on the mitigation front on the financing of these measures. If you wanted to talk about delivering a sort of future-proofed London, the cost of doing that is not going to be borne by government grant alone. There is no way that there is a sufficient volume of grant funding, particularly not in the current environment, so the challenge for

all of us is to think about how we actually pay for the kinds of measures that need to be put in place. In many cases there is already an underlying, in theory, economic incentive for people to do this because if you have a building or operations that are more robust and more climate-proof then in principle your insurance should come down, your risks should come down, but you are not seeing the level of retrofit activity, of adaptation activity, that you should be seeing based on that economic theory. Clearly there is something going wrong in the theory when you actually translate it into reality. The big opportunity for London is in the financing sphere, much like the CO₂ front where, again, I do not think we are anywhere near where we need to be, but there is a fundamental issue about how through some combination of public and private funding streams we actually deliver implementation of these things at the scale they need to be implemented on the ground and we are just not even remotely in the territory of where we need to be at the moment. The 2080s sound like they are far away, but when you are talking about three million homes in London and millions of square feet of office space then the 2080s are actually quite close. I think London could be unique on that because it is a fantastic opportunity for us if we can demonstrate ways of approaching this. It is something we have looked at through the London Climate Change Partnership a little bit. There is no creative financial thinking around that at the moment, but we have been trying to say that it is a great opportunity right now for the banks because they are arguing they have got quite a lot of money, they are interested in these new approaches, but we need them to be putting their thinking caps on to come up with ways to actually finance the scale of activity that is needed.

Q136 Chairman: Is adaptation something which is now affecting political decisions generally in London?

Ms Dedring: I would not say it is in the tokenism category, but it is not mainstreamed in the way that it needs to be. There is not that level of funding that is needed. For example, and Alex can talk a little bit more about this, we are doing this Drain London Project and it is £3.2 million worth of funding from Defra which is both to understand better the flooding problem in London both now and in the future and also to look at how we can more effectively respond to that problem. Within that, we are not just doing analysis, we are trying to demonstrate things like how do you get uptake of green roofs on existing buildings to reduce surface water flooding, how do you get communities to take ownership of the flooding issue rather than just thinking, "Right, I've got my house and periodically it floods, there is not much I can do about it", whereas if you look at a localised area that is subject to flooding risk then you could actually say every home is going to have a water butt, permeable surfaces in the front yard and the cumulative effect of that would be to minimise the flooding issue in that area. Those kinds of approaches need to be rolled-out much more broadly and at the moment

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these are just small pilots. We have enough funding and within the three million only a chunk of that is for these actual pilots. We are doing two pilots of community approaches, but that is the kind of thing one could imagine rolling out more broadly. At that level there is not that kind of machinery in terms of rollout. That is fine because it has been a period of people understanding the issue and getting to grips with the scale of the issue, but our view is that now moving forward we need to really think about how we move into the next phase where mitigation is a few years further ahead but not where it needs to be.

Q137 Chairman: Looking at buildings generally which could be offered to either owners or tenants of all types of buildings for taking adaptation measures, for example could we have variable rates of council tax or business rates so that there was a direct financial reward for people who took adaptation measures?

Ms Dedring: I guess implicitly they exist in certain aspects in terms of your insurance premium but, again, I do not think that is translating into decision-making on the ground and, unfortunately, economic theory does not prove to be true in reality. For example, on the mitigation side, which we are also using to deliver adaptation, we have got a London-wide home retrofit programme that we are rolling out and as part of that we are looking at energy efficiency measures but also water efficiency. The scale of funding that would be needed and the delivery structures to roll that out, as I said three million homes in London, we need to be doing not 10,000 homes a year but 100,000, 200,000 homes a year, that is simply not there. For all of those homes the economic incentive to take action exists now for every home in London. The vast majority of the things that you can do save you money on the mitigation side, it is a much more straightforward economic argument, but there is not that action happening. In adaptation one would expect it will be quite a lot more difficult because that direct financial incentive, “Put in loft insulation, save on your energy bill”, does not exist, so if it is difficult on the mitigation side it will be a lot more difficult on the adaptation side to let the existing incentives somehow percolate to the top. If we do want to see that kind of scale of change we need to put something else in place that is going to deliver that. Having said that, I would say our experience from the homes programme is that a lot of it is about the hassle factor, it is not about an economic argument. What we do with the homes programme is literally, “Stand aside, we will come in and do it all for you. You don’t need to even take out a single light bulb, we’ll put in the light bulb, you don’t have to go to the store and buy anything”. That does make a big difference in the take-up of those measures in those homes. It is not that people mind paying for it in many cases, it is simply, “Oh, I forgot to get the light bulb at B&Q this morning, I’ll get it next month”. A lot of those same issues are playing out on the adaptation side as well, it is simply not a priority for people even though on the basic math there is an argument for doing it.

Q138 Chairman: Given the scale of the problem, and you talked about three million homes and the urgency of stepping up the rate at which this is being addressed, are there extra policy levers you need? What can be done? I entirely understand what you said about the difficulty of if we cannot even persuade people to take mitigation measures which are often very directly in their own financial interests then how are we going to get them to do adaptation measures, but is there any policy lever that would be good for you or perhaps for central Government to have?

Ms Dedring: Two things spring to mind, and again new build is a bit easier because there are already good standards that are rolling out and it is really more about the big bulk of things that do not relate to new buildings. One is that certainly on the water efficiency side in our discussions with the Regulator and with the major water companies in London, they are all engaged in water efficiency at some scale but not at any kind of scale that one would want to see. It seems to be both a regulatory issue, that the regulatory algorithm does not sufficiently incentivise investment in water efficiency, and there is seen to be a risk associated with it, which is, “I’m going to put all this stuff in and then maybe people are going to use more water than they did before because they will just offset the savings by letting the shower run longer”. There is a behavioural uncertainty around that and then the water companies, therefore, do not take any major steps in that direction. We have had several discussions with Thames Water around the homes programme saying, “This is a great vehicle for you to roll out water efficiency measures” and they are interested, but it is not like they are biting our arm off, put it that way. I think that would be one specific policy intervention that we are certainly going to be speaking to Ofwat about. It is about how can we get water efficiency raised up the priority scale. If you look on the energy efficiency side, CERT¹ is not an adequate tool for delivering energy efficiency but at least it exists and there is no CERT equivalent on the adaptation side. It is a bit of a blunt tool, it is just a funding pot, but there is not such a thing on the adaptation side. Again, that is difficult. If you look at some other cities, things like green roofs, for example, a lot of other cities have removed the municipal storm water management charge and that has been an incentive that has worked quite well elsewhere, but we do not have anything like that. Here one could imagine having payment for storm water management which is then reduced or eliminated if you put the appropriate measures in place. It has been very effective in cities like Chicago and there is no reason to think that we could not do that here. Arguably it is fairer because you are paying for the amount of water that you discharge from your premises. I do not know whether there is anything else, Alex, on specific policy measures that might be worth mentioning?

Mr Nickson: I would just reiterate that I think we do have some problems in the fact that water is too cheap and drainage is something we do not

¹ Carbon Emissions Reduction Target

particularly want to talk about until it is in our front room and then we just want it gone, and the fact that there is no real driver for people to adapt, there is no immediate financial incentive. As we have seen from all too frequent flood incidences, even when people are flooded they are selectively oblivious to the fact that it might happen to them again and take some false comfort in the fact that a once in a 100 year event having now happened they are good for another 99 years. Even when we look at Carlisle, the number of people who signed up to the EA Flood Warning Direct, which is a free service providing warning, that barely rose after the flood event even though no major flood defences had been installed and nothing had really changed. People are particularly obdurate with regard to wanting to accept the risk that they face. As you eloquently put, if on mitigation where they are going to save money immediately we cannot persuade them then it is a really tough sell on adaptation. Some of the levers we could investigate are things like water companies, as Isabel said, being required to push water efficiency rather than sell water as cheaply as possible. We need to look at the insurance industry being a key player in helping us adapt because at the moment it is not really in their interest, the premiums do not differentiate against the risk. Also, when you are flooded or have to make a claim you get a like-for-like replacement and basically reinstate exactly what was affected last time rather than adding to some cumulative resilience measures. I think the insurance industry themselves need to start to have this discussion about when we are tied to an annual premium how they can encourage resilience measures as an industry so they collectively win rather than pricing it differently.

Q139 Jo Swinson: You have made a very good case for not just looking at it in silos of energy efficiency or water efficiency but doing it together and, good news as it sounds, the London-wide programme is more integrated in that sense although I am not sure if it involves resilience as well as water and energy efficiency. What do you think the barriers are to addressing this in that kind of integrated way?

Ms Dedring: At all levels of government these issues are handled by different departments. It is just an organisational culture issue, is it not, so they are not used to working together and, therefore, with the funding streams attached to that. Not to come on to air quality but we have got that issue there too where you have got the DfT dealing with issues around transport emissions and Defra talking to each other but it is not really a single integrated whole in that same way, and I am sure the same accusation can be made of the GLA. I think at an institutional level that is the biggest barrier I can see. Trying to go into somebody's home every three months to do something else is not realistic. We might succeed in getting them from level 23 on their priority list to 21, but you are never going to make these issues number one for the vast majority of the population. I wish they were, and I wish everybody thought what I think, but unfortunately all market research shows on green issues that, quite interestingly, you always

have the 20% who are quite passionate and want to do something, 60% do not really care unless it is super easy and 20% who are going to drive their SUVs just to annoy you, kind of thing. The issue is how we get at that 60%. For me, speaking a language of encouragement is not going to work, it literally has to be so easy and that means bolting as much together as possible. The homes programme already includes things like smoke alarms and benefits checks because that is a way to incentivise the local authorities to participate and it is a cheaper way of delivering those kinds of things to deliver them once. We would love to bolt other things onto that as well on the adaptation side because it is not comprehensive on that front. Again, there is a lack of funding and lack of partners. At least with the energy stuff you can talk to the energy companies—good luck, but at least they are there—but on the adaptation side there is not really that same obvious set of interlocutors to speak to.

Q140 Jo Swinson: Just following on from that, what do you think Government needs to do? Does Government accept that doing it in that kind of integrated way is the best way forward and, if so, what should they be doing that they are not to make that easier for you to implement?

Mr Nickson: I think the first thing is making sure that wherever they are pushing energy efficiency they are pushing water efficiency too because at the moment the CERT and the HESP,² replacement of CERT, currently only focus on energy efficiency. We have things like Energy Performance Certificates which do not consider water as well, but when you say we take the average home and 27% of the carbon produced in the home comes from heating water for washing and cleaning, if you can be water efficient you can be energy efficient and, therefore, you can be drought resilient and double the saving. A systemic change across all the government programmes to make sure that the water message and the energy message are perfectly aligned would be a very big help. I also think that potentially a reduction in VAT, if not a complete removal of VAT, on adaptation measures would make an enormous step forward. At the moment that would help to reduce some of the cost barriers that we perceive. That would be an enormous start.

Q141 Jo Swinson: In terms of funding options do you think it would be best to proceed with CERT as it is but to have something additional created for water efficiency or other adaptation measures, or do you think that CERT should be amended, expanded or scrapped and a new scheme put in place that deals with all of them?

Ms Dedring: I think the important thing is that the consumer does not want to know all about that stuff. They want to know somebody is going to show up, this is all going to happen and there might be some massively complex thing behind it. Obviously we would like to completely scrap everything and design a perfect solution but that is probably not

² Home Energy Saving Programme

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realistic just accepting that there should be a single frontline delivery structure, if at all possible, even if that is coordinated at the local authority level. The reality of life is that it is probably not realistic to expect a successor to CERT to be merged with five other funding streams or, indeed, 30 other funding streams. Just on the energy efficiency side there are more than 30 funding streams in London alone. What we are trying to do is cobble them altogether, but behind the scenes because trying to get the right answer seems to be very difficult just because of the inertia of life. At a minimum there should be some kind of recognition that these things should be delivered jointly, but there is no forcing mechanism for that to happen at the moment. I do think to the extent that some of this is delivered in partnership with or through the local authorities, if you look at the National Indicators on adaptation they are much weaker than they are in mitigation, so the NI targets around CO₂ are about reducing your carbon and you sign up to an actual percentage reduction in carbon either on your own estate or for the territory of the borough, and when you look at adaptation it is more about having an adaptation strategy. If we could change the National Indicators for the local authorities to be much more outcome based, certainly we have seen on the energy side a lot more engagement from the local authorities. They sign up to 12% and then say, "How are we going to get there?" We have had a lot more engagement on the homes programme, for example, as a result of that. That might be quite a useful way of moving. Where they are at the moment is appropriate for five years ago maybe, and that is fine, it is just that the issue is now moving on quite quickly so one would want to move to a more outcome-based metric. I do not know whether that is percentage of buildings that have been adapted or retrofitted, however one might want to define it, but moving towards a more outcome-based metric.

Mr Nickson: The Pitt Review went a long way in trying to reduce the separation between spatial planning and emergency planning, but we still have a fundamental capacity lack in London and, therefore, I am presuming nationwide in getting spatial planners and emergency planners to work together. When you look at things like the civil contingency it is always about what is the priority in the next five years rather than what contributes towards a priority that is going to exist for the next 30 years. We do have this problem that needs to be tackled there and a lot of that is awareness-raising capacity. Isabel referred to the Drain London Programme where we are going to try to bring together groupings of boroughs that face a shared flood risk and make sure we have got a mix of emergency planners, spatial planners, building control experts, so we can start to look at how to manage flood risk across a flood zone so there are shared solutions. That expertise may come from several different boroughs but it builds the capacity towards a single approach rather than the fragmented individual approach that we saw, say, through strategic flood risk assessments where you had individual local authorities working on their

own and quite often the solution was to get rid of the water as quickly as possible and pass it downstream to your neighbour. We really want to learn the lesson and ensure that in London we use this capacity building. Support from Government on that through Drain London has been great and I think we will be able to pilot that system to be able to look at how to roll it out much wider. The other thing is any communications just to raise public awareness. As I said, people are very selectively oblivious on a lot of the climate impacts they face. One of the things we are doing on the consultation of the adaptation strategy we are going to be launching shortly is we are building a bespoke website that is going to ask Londoners what they as individuals and communities can do. It is not about, "You the Mayor, you the Government need to do this", it is trying to say, "You live at a certain risk and a lot of that risk is caused by your lack of awareness and your lack of capacity to act. What is it you think you can do as an individual or a community?" and be able to monitor that and understand what it is we can do to actually help Londoners. I think that is going to be a very powerful tool because, for once, it is going to take the responsibility to act off Government and put a certain element of it back on to the public. We all remember those pictures from Carlisle of the guy saying, "I've rung my local authority 15 times for some sandbags and they are still not here to come and do anything". We need to enable people to know what to do to help themselves and, importantly, to pull together as a community to help each other. So someone will go and help Mrs Miggins next door as well as helping themselves rather than sitting around waiting for the emergency services who really need to be tending to the most vulnerable.

Q142 Chairman: That suggests clearly there is an important role for the local authority in raising public awareness about what they should and could do, but is there also a role for central Government in raising public awareness?

Mr Nickson: Yes. I am not sure exactly how. There have been a lot of Government adverts recently about eating healthier, stopping smoking, but you cannot scare people into being slim, green and healthy. A lot of money has been put into that. As I said earlier, adaptation is a tough sell but we do need central Government on this. The Mayor in many ways is a very good voice for Londoners because of his independence. We have been talking to the water companies about the Mayor being a voice about water efficiency, particularly during drought times, because no-one is going to respond to Thames Water telling them to be water efficient when they know they are losing 600 million litres of water a day from their leaky pipes, whereas a message coming from the Mayor may be much better received. We are starting to work out what are those communication channels, who are the voices and the agents that can actually provoke this change.

Ms Dedring: There is a fundamental issue across all green communications of "stop this" or "don't do that". I was talking to Eddie Hyams the other day,

the Chair of the EST,³ and he was saying “low-carbon, micro-renewables”. It is all deeply unaspirational and, whatever you might think of it, does not fit with the quite consumerist society that we live in today. We find that loft insulation might be ten times more effective than having a solar panel on your panel or a wind turbine in particular locations but that is not what people want because they want the eco-bling factor. I do not think any of that has been brought to bear on the adaptation side of things. A lot of the things that you can do to make your home more adapted are nice, attractive, make the comfort of the home increase. One thing we found in the homes programme was draught proofing has quite a poor payback but people love it because it makes their home more comfortable because they could feel the draught coming through. You need to accept those are the kinds of things that motivate people, not the, “This has a 2.5 year payback” or “This is the best way to battle flood risk”, just focusing people on things they can do that they would want to do for other reasons, almost irrespective of adaptation, things like green roofs. People love green roofs so that is a lot easier to sell to people than even something like a water butt which is going to take up space, is plastic and looks ugly, just starting with those messages that are more positive for people. There has been no connection, as Alex was saying, between, “It’s flooded here and here’s something you can actually do about it”. People do not make that link at all as far as we can see. That is the kind of connection that people can make, but in the absence of anything to point people towards it is quite difficult to try and do that because what is Government saying at any level but “Go out and buy a water butt”, and that does not really work. I think the tone of the communications needs to change quite significantly.

Q143 Dr Turner: The GLA is quite unique amongst local authorities in actually having a statutory duty to address climate change. You have not had this statutory duty for all that long, how much difference has it made towards the work on adaptation and addressing climate change risks in London?

Ms Dedring: A personal view almost is it does not have any real practical implication but has a big impact almost internally in convincing other parts of the bureaucracy who think that they do not need to worry about environmental issues, “That’s something the environment team worries about over there”, and it makes people take the issue more seriously. Whilst it is quite symbolic perhaps, or semantic, it has made a big difference and anything like that can help. The more that those kinds of pressures can be made outcome-based, as I was saying about the National Indicators earlier—we are not subject to that regime because we are not a typical local authority—all those things are useful and moving in the right direction. Having said that, as I said earlier, it is not something that is considered in the mainstream of decision-making at the level

that it needs to be. It is improving all the time but it is not where it needs to be. There is a lack of joined-up thinking still.

Q144 Dr Turner: It has not made a quantum difference then?

Ms Dedring: I think that is a fair statement. It has made an incremental improvement over time, but it is still hard work. All the work that is going on in the urban realm and green space and making the case for some of those things and for more funding internally to be routed in that direction is not just about “trees are nice”, but “this is actually going to improve the resilience of London” and that case is not really made internally even to the point of when you look at the business cases they will not necessarily even be aware that is a value that could be assigned to this. I used to work at TfL and the way they valued the impact on the environment—it sounds quite parochial but it is an important point because this is how these bureaucracies work—was that there was a box in the business case that said, “If you want to say anything on environment, say it here”, but it was not quantified as part of the economic analysis. That has now changed, but that is not untypical for a lot of bureaucracies.

Q145 Dr Turner: Has it created a new cost burden on the Authority? In Private Members’ Bills in the past I have tried to impose statutory duties with respect to the environment on local authorities and Government has been terrified of creating cost burdens. Has this actually created a cost burden for the GLA or perhaps even relieved some cost burdens?

Ms Dedring: Looking at it over time it relieves cost burdens but it is very hard to get decision-makers at any level to see this. It is the “invest to save” argument which is very difficult. The way that we do budgeting it is very difficult for people to find. There is not a line item that says, “£100 to invest to save £30 a year forever” or “To reduce my risk of X happening by Y”, which if you quantify that totally justifies the £100 investment. Just the way the budgeting processes work, it is, “I haven’t got £100 today”, which is why some of these financing issues are so crucial. Obviously we would not do things on the environment front that made absolutely no sense at an economic level because they probably would not make sense at an environmental level either. These are all things that are good because they are reducing your risk, improving the quality of life or whatever it is. It is very easy to make a case for most of these things; the problem is more the distribution of the cash flows effectively. That is still an issue and it is very difficult to extract those line items out, which is the green investment bank where people have talked about public-private vehicles for funding these kinds of things and there was a recent announcement around Partnerships UK, I think.

Q146 Dr Turner: It is kind of aspirational window dressing then. Do you think it is worth extending the statutory duty towards all local authorities?

³ Energy Saving Trust

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Ms Dedring: I do not think it can hurt. If people think that is going to be the solution to all the world's problems that is not going to work. We are quite far away from where we need to be. In our experience, in a lot of fields the more we can start to create programmes that deliver on the ground the better, and those kinds of duties do not really create sufficient pressure to trigger the creation of, say, the homes programme, for example.

Q147 Dr Turner: What about the monitoring of compliance with your duty? Does the Audit Commission rate you on your discharge of this duty?

Ms Dedring: I do not know the answer to that. Do you know?

Mr Nickson: No. Adaptation is notoriously difficult to measure. There is no nice, easy metric like tonnes of CO₂ or gigawatt hours of energy saved, which is why many of the Government measures of adaptation have resorted to being process-based rather than outcome-based. We do not actually have a measurement of how we are achieving it. I think this is going to be one of the interesting things that is going to come out of the reporting power, how we are going to be monitored on our level of adaptation over every five years based on that process. This is one of the things I have really struggled with in developing the adaptation strategy, to find a nice, solid metric that demonstrates how we are adapting well to climate change rather than the fact that we just have not had any extreme weather over that period to have caused any impacts which tends to be how most people like to measure, the number of houses flooded and so on. No, there is no easy measure there. That is something we are trying to set for ourselves as a way that we can benchmark today and then measure our adaptation going forward, but it is a very complex issue.

Q148 Dr Turner: What mechanisms do you have to ensure that climate change and adaptation is taken into account in business as usual activities and new projects?

Mr Nickson: It is part of the decision-making framework we have at the GLA. There is the inevitable tick-box exercise of "Have you considered sustainable development, equalities and climate change issues?" The London Development Agency has it as part of their gateway funding process where you have to demonstrate it. Transport for London have written it into their procurement codes where new assets being procured need to demonstrate how they have considered the future environment and so on. That is the start we have made so far.

Q149 Dr Turner: Are you convinced that different departments of the GLA have the skill sets needed to make this work?

Mr Nickson: Particularly with the 2009 UK climate projections it is very difficult to take a risk-based view, so we have been working very closely with the

Living with Environmental Change research projects to try and look at exactly these kinds of metrics. I sit on five research projects looking at how we provide design guidance so we can understand how we are measuring our adaptation. One of our projects is to look at how to predict overheating in buildings in the future so when we are asking developers to use this guidance we can judge whether a building is going to be overheated or not and, therefore, how resilient it is to a future climate, but it is a very slow and technical journey.

Ms Dedring: The one thing we did at TfL that was very effective, and again it was on the mitigation side, basically was top-slicing everybody's budget creating a climate change fund into which people could bid. Of course, it was their own money which had been taken away from everyone, so it was the same money, but the incentive it created was to answer this whole problem of, "Well, I want to do this because it's environmentally good but I haven't got £100". We required people to bid into this fund which suddenly created a lot of interest in the topic because there was money associated with it. Something in that vein can be very effective. It is probably similar to the equalities agenda too where in every business case that goes through the organisation you have got to say "Have you considered equalities?", "Yes". Have they deeply thought about the issue? How do you actually measure whether people have seriously investigated that question? The more that you can put hard numbers and targets on it you can say, "I'm going to deem you have not seriously considered it unless I see X to be the case". That totally transformed the decision-making process within TfL on the CO₂ front, so we could have something similar on resilience. How you actually specify that, probably the national indicator route rather than the statutory duty route would be more effective to deliver that.

Q150 Chairman: Do the latest climate predictions enable you to assess what the actual impact of climate change is going to be on London?

Ms Dedring: Yes and no. Directionally, yes. I get frustrated because I think we spend a lot of time saying, "Is it a 3.9° increase or a 3.85° increase?" and you think it is a lot more than it is today, it is going to be hotter, what are we going to do about that, and while we are spending all this time arguing about point X or point Y we are not actually doing anything about it. Whether it is 3.8, 3.9 or two you would still want to take action to tackle this problem. In fact, even if you just looked at status quo today you would want to do something about it because we already have drought problems and overheating and those kinds of things. That is one of the nice things about adaptation, it is something people see every year. They will see some form of drought, overheating or flooding in a certain part of London typically, unlike mitigation where it is some amorphous concept of CO₂ going up into the sky, or on air quality where, "It's not affecting me, it's somebody else down the road and not really my

problem". That is all to the good. Where we struggle is a lot of the projections are not specific to London and do not necessarily look at the urban environment, they extrapolate from rural projections to draw conclusions for the urban context, so that is something we are doing a piece of work on at the moment that Alex can comment on. It is trying to look at a more micro-level at what is actually going to happen, not just, "It'll be hotter".

Mr Nickson: I have to say I have been working very closely with a number of groups to try and look at how we make UKCP 09 more understandable and the deeper I get into it the more I become confused. It is very difficult to take probabilistic projections and get people to use them unless they know the point at which an exceedence then affects their system. The first thing you need to do is understand how your system responds to various climate variables, to know when you will then change from a business as usual position to a more extreme position that, therefore, has unusual impacts, say, upon your budget or other resourcing. One of the things we have been trying to work with TfL on is to understand how day-to-day climate variables affect their basic operation. When do wind speeds mean that you need to reduce train speeds? When does overheating of tracks mean you need to reduce the train running times? A lot of it is about starting to understand the critical points where these things occur and then using UKCP 09 to understand how much more frequently that will happen in the future. A lot of the delays in the production of the UKCP 09 tools have not helped us to understand that. The critical one was this threshold detector which enables you to determine how many times, say, a certain temperature is going to be exceeded in the future, so if you know that at 32° you have to start changing the way your system works, and you know that today it may be only three or four days a year you can manage that under an emergency measure, but if it is four weeks or four months in the future then you fundamentally need to change the way your system works, we are on an early path on that. The Thames Estuary 2100 Project was a very good example of how to use that. They looked at how various levels of sea level rise affected the number of closures of the barrier, but also where certain responses stop working, so they know that at one metre you can deal with it with the current system, at two metres you need to be raising flood defences inside and outside London and at four metres you need another barrage. We would like to see that now applied, say, to the water system so we know that with a certain number of dry days or dry years in a row you can survive on reservoirs but after that you then need to look at a range of measures, water efficiency, grey water recycling, whatever, and apply the climate scenarios to that. It is early days but there is starting to be the ambition on it and things like the LWEC⁴ project will help. I do think we have lost a lot of capacity, particularly in the royal and professional institutions, to really take this by the teeth. Maybe I am being a bit harsh on some of them but I do expect

them to be leading the discussion on this. We have got to get away from the current, "Look at the X axis and read off the Y axis and that's what we'll build" back to understanding that there is a grey area on either side and, therefore, we need professional advice on that and I am not sure we have the capacity in the UK on this.

Q151 Chairman: Arising from that answer, what are the implications in terms of cost if you can see the range of things that might happen? Are you starting to estimate what the costs of responding to that are likely to be?

Mr Nickson: We have started to look at some of the cost-benefit analysis. I would give you one exemplar of a guy called Dr William Bird who looked at the health benefits of green spaces. He did a very exhaustive study to look at what was the health benefit per hectare of a green space when monetarised and came up with some incredibly large figure that everyone instantly dismissed because it did not fit in with their mental projection of what they were worth, but when you combine reducing obesity, improving mental health, reducing days off sick and so on, green spaces do have an enormous benefit to society. We have started to do some of that work looking at the benefit of green spaces offsetting the urban heat island effect and in providing sustainable urban drainage. I think we could spend a lot of money and a lot of time going down that pathing to come up with a figure that is dismissed as being incredibly large when actually we just need to get on and do it. We have set ourselves some fairly robust targets for increasing green space in London, both street tree cover and green roofs, pocket parks and so on, because we know it is the right thing to do and, in parallel, we are going to keep working up the arguments on the cost-benefit analysis. I think this dual approach is the right one for us and one we need to encourage.

Ms Dedring: The fundamental point about is it worth it, is there is a cost associated with not doing something. The reason that it is valuable to look at that is to say, "You should be prepared to spend up to X to avoid that happening". For example, we have set a target based on some work they did in Manchester which you are probably familiar with. They looked at central Manchester and if you increased the green cover in central Manchester by 10% it would stabilise temperatures over the next century instead of the kind of rises that the CP⁵ work suggests. Obviously those temperature rises have health costs associated with them, rising use of energy for air conditioning and, therefore, a further negative feedback cycle because of that. Presumably that, roughly quantified, would show you that it is worth investing in the green space in order to do it. We have talked a lot about buildings, but things like trees and parks are the first things that get cut in difficult budgetary times that are seen as discretionary, "It's nice to have trees but if we don't have any money we won't have any trees or we won't

⁴ Living With Environmental Change

⁵ UK Climate Projections

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have any parks". I have been trying to approach some of the financial institutions and government bodies to think about how we can think about this from a purely commercial standpoint. There are benefits associated with X and, therefore, we should be prepared to spend Y, but the problem is how you capture the benefits. On the energy side it is a lot more straightforward but even there it is difficult to do. We are not there yet at all. I think that is what people like the banks and pension funds need to help us to look at.

Q152 Mark Lazarowicz: On this issue of how you pay for the work that needs to be done, given pressures always exist upon public sector budgets what are you doing and what can Government generally do to ensure that adaptation is given a high enough priority in the allocation of funding?

Ms Dedring: One thing that we do is look at all the potential. If you think about it within the organisation it is environment fighting everybody else for funding. Rather than saying, "We need a new budget line item", we say, "Here's a set of activity which actually delivers a more resilient city, delivers adaptation", but may not have been set up deliberately to deliver that in the first place. For example, the London Development Agency underneath the GLA has got a big programme of investment in the urban realm, but because that is about things like making London look nicer it does not necessarily include things like soft landscaping, trees and green roofs, those kinds of things. It might just be something that an architect would deem to be beautiful but would not necessarily have any greenness in it and because that area is being regenerated and redone it is an opportunity to put in a lot more green cover. We are trying to redirect budgets across the board, although that is a small example. There are also cases such as where the Mayor has got a programme to plant 10,000 new street trees in London and that was just a case of cancelling a series of things and reallocating the money. There is usually limited opportunity to do that. There are big funding streams associated with things. Because adaptation is quite cross-cutting there are a lot of funding streams that one can seek to redirect but that is less than satisfactory if you want to do something on a big scale. Unless you can somehow find a way to bring commercial money into these issues through whatever mechanism, and I do not particularly care, whatever is going to work, this will not happen. Section 106⁶ is another interesting opportunity which is not publicly exploited to the full extent that it needs to be for a whole range of things, but adaptation is one example of where it is down to the local authorities how they want to use it. They could be requiring developers to increase green cover in that area by X per cent every time a new development is put in if you want to think about an air quality neutrality or water neutrality type of concept.

Q153 Mark Lazarowicz: How do you cope with a situation where certainly in a smaller local authority there can easily be a situation where the opportunities and need for adaptation may be much more than one just literally down the river and that authority may not be able to fund this sort of work internally? How does central Government have a role to basically recognise the fact that different authorities have got different needs and opportunities as far as adaptation is concerned?

Ms Dedring: Not to be too simplistic, there need to be central funding streams for some of these things. It is worse than the mitigation situation where CERT is not adequate but at least it exists, so that is a good starting point. We need to be getting about ten times the amount of money we are getting through CERT into London. What are those funding streams around adaptation? I cannot think of anything. The Defra money, the three million, is an astronomical sum in the world of adaptation. It is partly because it has been so centred on analysis, risk assessment and those kinds of things so it is not seen as a delivery issue which has more funding associated with it. The issue is at the national level can we do something similar as we do at the London level, which is not about making the case for more money, because we are not going to get anywhere with that kind of argument, but about saying, "Look, there are these ten teams which are delivering those kinds of outcomes, so let's either slice bits off of it or lump it together and call it the adaptation programme" and refocusing it in that kind of way. Everyone needs to be pragmatic, there is not going to be £10 billion becoming available for something like that.

Q154 Jo Swinson: Obviously funding is an issue but, as you have said, there is a degree of realism here, so to what extent do you think the Government is providing adequate leadership, if not the funding, in terms of the country's response to the adaptation issue?

Ms Dedring: Adaptation reminds me a little bit of biodiversity. It is such a broad phrase that it means everything and nothing to a lot of people. The more concrete we can be, even if it is just saying, "Here is a bunch of statutory activity and funding, all of which amounts to adaptation", so if you are a small local authority that feels you have got enough on your plate, say you have got a lot of poverty in your area, it is not going to be a priority to look at adaptation because it is somewhere out there and you do not need to worry about it, but highlighting some things you can do today with existing funding streams and existing statutory powers could help without creating new big funding pots. Again, something on the National Indicator side could help as well. It is going back to the delivery side. There is not a machinery that is rolling out improvements to how adapted the UK is. There is a lot of work going on around looking at modelling of 2100, or whatever it is, and we now need to start getting into the action side of it.

⁶ Section 106 of the Town and Country Planning Act 1990

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Q155 Jo Swinson: Do you feel that the Government has properly defined adaptation and communicated what the priorities for action need to be?

Ms Dedring: I would say no.

Mr Nickson: In some ways that is exactly the point of the programme. It is a massive leap forward from where we were even three years ago. The programme is all about identifying what are the priorities and ranking them. That is to be praised. In some ways, it is a shame it has taken us ten years of extreme weather to start to get to grips with it. A lot of that was due to the fact that adaptation was seen as somehow detrimental to mitigation and an acceptance of failure, but I am glad we are now over that and recognise they are perfectly parallel and quite often mutually supportive aims. I would come back to my original point. We still have a problem and there is a lot of inconsistency in government programmes where mitigation measures are acting against or not necessarily supporting adaptation measures. We need the Code for Sustainable Homes to take on adaptation issues much more and building regulations need to be brought up-to-date as well to reflect that. Things like the water calculator in the Code for Sustainable Homes just does not work to incentivise water efficiency, particularly in urban areas. The Building Schools for the Future and the Better Hospitals Programmes are still building hospitals that overheat today and they are going to have to undergo painful and expensive retrofits in the future. There is a lot more that we could be doing now and doing better. Part of that is because no-one has really looked at how to use projections in the future to manage risks today. I do not want to criticise them too heavily, we are progressing in the right direction, it is just painfully slow.

Q156 Dr Turner: Has the Government's Adapting to Climate Change Programme had any effect on your capacity to manage climate change risks, or is there more that the programme could do to support the GLA and other public bodies like yourself?

Mr Nickson: We are unusual in the fact that we are one of the leaders on adaptation, we are the ones asking the awkward questions such as you are now asking of us. We are stuck looking for the same answers. I think the Government is playing catch-up in a number of areas. We are lucky to have UKCP 09, which are the best climate projections in the world, and when we get to understand how to use them properly it will be a phenomenal tool. I think the national risk assessment is the right way to be going. I am advising the Government on it and how to deliver it. The National Indicators on it are the right way to go. Perhaps we should be looking a bit more at outcome-based indicators rather than process-based indicators because that does just encourage a tick-box culture. On all fronts it is progressing in the right direction. I am afraid I do not have a silver bullet that would instantly help us undertake a quantum leap on adaptation but I do think a lot of it is to be supported.

Q157 Dr Turner: Is there a coherent organisational framework to deliver this efficiently?

Ms Dedring: No. It is still at the first stage of the process as far as I can see. It is analytically helpful and moving in the right direction. Statutory duties are great but, again, where is the piece of machinery that says, "Here's all our large infrastructure across the country", whether that is transport infrastructure, energy, whatever it is, "What are the implications of climate change for that, what are we going to do about it? Who is going to invest to make it happen?" That is not happening, it is very ad hoc and depends on the organisation. Everybody is kind of trying to avoid it if they possibly can because nobody really wants to think about the costs associated with that. Where is the programme of large-scale green space preservation and further rollout, whether that is trees, green roofs, who cares, expansion of parks, protection of existing parks. We have got a huge issue in London of paving over private gardens which now the Government has tackled relatively effectively. There is not that systematic how do we get from point A to point B, and there is not even the piecemeal bits of it starting to come together which you do see on the mitigation side. It is not on the scale that we need but we are starting to see the right kind of activity. In building and retrofit we see the same thing. Here is a world that we are going to live in, where London is going to be fully retrofitted, ready for the future, and maybe it is not going to be perfect but I do not see that roadmap at the moment at all.

Q158 Dr Turner: Do you see a role for regional government in the new framework for adaptation?

Mr Nickson: Yes, taking London as an example and maybe obviously given the unique example that the Mayor is, we are able to take a view that is strategic and, therefore, we can encourage local authorities to work collectively on mutual issues where, if they were left to their own devices, they would work probably individually, so that is a unique role we can bring. As demonstrated by the Homes Energy Efficiency Programme, we are able to cobble together large numbers of small schemes to create a more substantial scheme which, by value of its cost efficiency, can deliver much more, so I do think yes, there are very definite benefits to the regional engagement that just cannot be seen and are less effectively done at a national level.

Ms Dedring: Potentially rather than in the statutory duty, national indicator space, but more in the programme delivery and co-ordination. Certainly we have got a lot more engagement from the private sector in terms of participating and putting money into these programmes because they see us as an efficient route to market basically. They are not doing it out of the goodness of their hearts, but they get an opportunity to go into lots and lots of homes, which an individual borough cannot deliver. One of the reasons that we have not had the scale of activity on water efficiency or home energy efficiency needed in London has been because of the sort of piecemeal,

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“This borough has a 100-home programme here and this has got about a 1,000 homes over here”, so that, I think, is where a sort of co-ordination function or single procurement vehicle can be quite useful.

Q159 Dr Turner: Do you see any regional co-ordination going on outside London?

Mr Nickson: I do not feel I am in a position really to answer that.

Ms Dedring: I would say some regions yes, others no, and it really depends. It is a bit driven by personalities and individual parts of the organisation, so it is quite patchy, I guess.

Chairman: Thank you. I think this might be an appropriate moment to move on to the next subject.

Tuesday 19 January 2010

Members present

Mr Tim Yeo, in the Chair

Mr Martin Caton
Colin Challen
Mr David Chaytor

Dr Desmond Turner
Joan Walley

Memorandum submitted by the Environment Agency

SUMMARY

The challenges of climate change are tough and immediate. The UK is experiencing more unpredictable weather. More frequent deluges of rain threaten serious flooding, and in the south and east of England, water will become ever scarcer. To help meet these challenges, we believe adaptation must play a bigger role in public policy over the coming years.

Our main points are as follows:

- The profile of adaptation policy has progressed significantly over the last two years, due largely to the statutory provisions in the Climate Change Act and the work of the Government's Adapting to Climate Change (ACC) Programme.
- However, adaptation policy across Government remains at the early stages of development.
- Responsibility for assessing and managing climate risks must rest with each Government Department, not the ACC Programme secretariat.
- We support the commitment by all Departments in the ACC Programme to produce adaptation plans by spring 2010.
- We support the Adaptation Reporting Power. We will be one of the first Authorities to report and we hope that our report can act as an exemplar to others.
- We note the need for some organisations, in particular local authorities and Reporting Authorities, to receive additional guidance and training on adaptation.
- The guidance relating to the proposed new Regional Strategies should clearly set out requirements relating to climate change adaptation.
- The role of the Adaptation Sub-Committee is vital to maintaining the required focus on adaptation.
- The most effective way of embedding adaptation is to integrate it into existing risk management frameworks and business planning.

1. The adapting to climate change programme

1.1 The profile of adaptation policy across Government remains at the early stages of development. However, it has progressed significantly over the last two years, due largely to the statutory provisions in the Climate Change Act and the work of the Government's Adapting to Climate Change (ACC) Programme.

1.2 We welcome Defra's commitment and enthusiasm to drive adaptation across other Government Departments (OGDs). However, ultimate responsibility for assessing and managing climate risks must rest with each Government Department, not the ACC Programme secretariat. Each Department must take responsibility for its own climate risks and deliver policy, programmes and projects which are adapted to future climates.

1.3 Government Departmental Adaptation Plans will be a key stepping stone in this process. The timetable for producing these is ambitious (March 2010) and Government Departments will need to ensure that the process is properly resourced.

2. Government Departments, processes and structures

2.1 How Government Departments respond to the challenge of adaptation will be key to the country's success in adapting to climate change. They are required to do this by Public Service Agreement (PSA) 27 which states, "UK will develop a robust approach to domestic adaptation to climate change, shared across government."

2.2 The recent NAO report indicates that some progress has been made, although the stage different Departments have reached varies greatly.

2.3 All Departments in the ACC Programme have committed to producing adaptation plans by spring 2010. Scrutiny of these plans is essential and will help establish what progress is being made. We would recommend that Departments are requested, either by the NAO or the ACC Secretariat, to complete the self-assessment tool on a periodic basis.

2.4 Perhaps most importantly, the Climate Change Act introduces a continuous five-year cycle during which the Government must report on the UK's climate risks and develop an Adaptation Programme to address those risks. This statutory framework and policy cycle will require significant investment and resources. Government Departments will need to provide resources for this in terms of work on evidence, risk assessment and policy development.

3. *The overall direction for work on adaptation*

3.1 We believe that the Climate Change Act, the ACC Programme, the Adaptation Sub-Committee, the UKCIP and the forthcoming departmental action plans provide a good foundation for future work on adaptation.

3.2 The Adaptation Reporting Power will encourage public bodies and statutory undertakers properly to address climate change. We welcome the approach set out in the recent consultation document to ask a wide range of bodies to report.

3.3 However, many reporting authorities are only beginning to learn about their risks from climate change. If the reports are to achieve their potential, authorities must be given assistance as they develop their reports. A process should be established to facilitate the development of good practice and encourage cross-organisational learning.

3.4 For the Government and others to get full value from the reports, they must be properly assessed and compared. Sufficient resources will need to be allocated to a comprehensive review process. We also recommend that all reports are summarised in a single synthesis document. This document would enable stakeholders to gauge progress on climate change adaptation, in the UK and in each sector, and identify synergies and conflicts across reporting authorities.

4. *Protecting key infrastructure and systems*

4.1 We believe there are probably large differences in the degree of preparedness of the many organisations responsible for key infrastructure and systems. The Adaptation Reporting Power will provide clarity on this and will encourage organisations to identify and address climate change risks to their business.

4.2 Water industry

4.2.1 Defra's Statutory Social and Environmental Guidance to Ofwat states that water and sewage companies should consider the "risks and impacts of floods on water and sewerage infrastructure and the greater incidence of more extreme weather conditions that climate change is likely to bring". In response to this, as part of the 2009 Price Review (PR09), water companies have considered their resilience to extreme weather and flooding alongside other risks in their business plans. Progress on this will depend on the final outcome of PR09. The Environment Agency is generally content with the steps the water industry has made in this area, and we feel other sectors could learn from their approach.

4.3 Critical infrastructure

4.3.1 The Pitt Review into the summer floods of 2007 highlighted a number of issues which Government and the Environment Agency should address to help critical infrastructure become more resilient to flooding, both now and in the future. The first recommendation was to increase the priority given to adaptation across Government.

4.3.2 In June 2009, Government published a progress report on delivering the Pitt Review recommendations and the Environment Agency has been working closely with Defra, the Met Office, Local Authorities, Local Resilience Forums and owners of critical infrastructure to make good progress on these. We have provided information on flood risk to Local Resilience Forums on which they can base their actions.

5. *Funding, support and training*

5.1 Training

5.1.1 To assess their risks from climate change many organisations will need a good understanding of UKCP09 scenarios and outputs and how to use them.

5.1.2 UKCIP's Projections in Practice are an excellent, free training resource to help build capacity across the country.

5.1.3 However, many organisations will need further guidance on how to assess their risks and how to use UKCP09. We believe UKCIP has a vital role to play although their reach is constrained by resources. The ACC Programme should establish how such assistance can be provided, particularly to local authorities and bodies subject to the reporting power.

5.2 Flood risk

5.2.1 Our Long Term Investment Strategy used UKCP09 data to assess future flood risk in a changing climate. It found that if the current level of spending is maintained, by 2035 the number of properties at significant risk could increase by 330,000. To maintain current levels of protection from river and sea flooding spending in real terms on flood defences will need to increase from £570 million in 2010–11 to around £1 billion in 2035. In addition the risks of surface water flooding will increase and require extra investment in solutions such as sustainable drainage systems.

5.2.2 Most of the benefits of flood risk management measures accrue to the private sector. The Pitt Report into the 2007 floods called for new funding approaches so that the direct beneficiaries of flood defences supplement central Government funding. We back this call for new sources of funding.

5.3 Regional and local

5.3.1 The Local Democracy, Economic Development and Construction (LDEDC) Bill proposes the introduction of integrated Regional Strategies which will combine spatial, economic, social and environmental strategies into a single long-term vision. It is vital that the guidance for developing Regional Strategies clearly sets out requirements relating to climate change adaptation.

5.3.2 The Regional Climate Change Partnerships (RCCP) play an important role in helping regions and communities adapt to climate change.

5.3.3 Upper-tier local authorities now have a duty to report on their progress on climate change adaptation under National Indicator 188 (NI188) of the new local performance framework. We see the introduction of NI188 as a positive development which will drive adaptation work at the local level.

5.3.4 Evidence from our Area offices suggests that local authorities often lack the resources and expertise to deliver fully their adaptation objectives.

5.3.5 We note that the EAC made a number of recommendations relating to regional, local and devolved Government in its previous inquiry into climate change (July 2008). Many of these recommendations and observations remain valid to this inquiry.

6. *The monitoring and evaluation of work on adaptation*

6.1 We see the role of the Adaptation Sub-Committee as vital to maintaining the required focus on adaptation.

6.2 We welcome the EACs continued scrutiny in this area. However, we recommend that the Departmental Select Committees also scrutinise their Departments on adaptation.

6.3 We agree with the NAO report that measuring progress on adaptation is difficult, especially in terms of quantitative targets. However, we believe individual departments and organisations should set their own measurable adaptation targets where possible.

6.4 In other cases, Government may have to continue to rely on qualitative targets. The process targets used for NI188 are a good example of these. In time, when we know more and the adaptation agenda is further advanced, some of the actions should be developed into outcome targets.

7. *Communication on adaptation*

7.1 General awareness of the possible impacts of climate change has increased in recent years. This has been in part due to extreme weather events, including the summer 2007 floods.

7.2 Communicating what climate change will mean for individuals and communities has always been challenging.

7.3 We have focused our communications on helping organisations and communities prepare for the impacts of climate change such as flooding and water shortages. For example, our Floodwise campaign aims to ensure that people at risk receive appropriate flood warnings and take action to protect themselves and their property.

8. *Embedding adaptation into existing frameworks*

8.1 For successful adaptation to occur it must be embedded into existing policies, including sustainable development frameworks. Preparing for climate change should now be seen as a key element of sustainable development. This has in general been acknowledged by frameworks on sustainable development.

8.2 However, the most effective way of embedding adaptation is to integrate it into existing risk management frameworks and business planning. Adaptation should not be considered an “environmental or “sustainable development issue. Adaptation is essentially risk management and is the responsibility of corporate decision-makers and planners.

Further memorandum submitted by the Environment Agency

1. *To what extent does the current Total Place programme address adaptation?*

From what we understand the current Total Places Programme does not address climate change adaptation explicitly. Key themes of Total Places are alcohol and drugs, health and social care, children, crime, young people and employment. We have supplied data, on request, to the HM Treasury on the Environment Agency's spend in the current pilot areas.

2. *Would it make sense for adaptation to be addressed by the Total Place programme?*

Total Place is a new concept that offers both opportunities and challenges for delivering environmental outcomes that are robust in the light of future climate change. Councils have a key role in addressing the impacts of climate change in their area, and they will need to work with a range of partners to ensure that their communities are better prepared for a changing climate. The opportunities provided by Total Place to identify barriers to effective collaboration and enhance partnership working are welcomed.

However, Total Place also presents some major challenges, mainly relating to scale and cross-boundary issues. The majority of the Environment Agency's work, for example, has an implication for a whole river catchments, which in many cases cross local authority boundaries. For example, decisions on flood prevention schemes upstream can affect the flows of water and risk of flooding in a neighbouring local authority area. The catchment approach makes alignment of funding with strict political boundaries potentially misleading as the benefits from our work are often wider.

In terms of "counting" the spend of an area, we highlighted to HM Treasury that the Environment Agency administrative boundaries are determined by river catchment areas, not local authority boundaries. We report our expenditure at several levels, including national, Environment Agency Region and Area, and by flood risk management and environmental protection functions. We do not currently break down or report our spending by local authority area.

Further work needs to be done to determine to what extent a Total Place approach is appropriate for delivering climate change adaptation and other environmental outcomes.

3. *How might adaptation be built into the Total Place programme going forward?*

Currently, the most effective way of ensuring that adaptation is built into the Total Place programme is to ensure that both Government Departments and Local Authorities are clear on their climate risks and adaptation priorities, so that these can be incorporated into locally agreed objectives as well as the design of programmes and projects.

Government Departments are currently developing their first Departmental Adaptation Plans, which will begin to provide this centrally. All Local Authorities need to embark on a similar process as that set out in National Indicator 188 (Adaptation) of the Local Government Performance Framework so they are also clear on their adaptation priorities going forward. Evidence from the first year of implementing the LAA framework shows that most local authorities are still at an early stage in assessing climate risks.

We would be interested in exploring how adaptation to a changing climate could be best incorporated in the Total Place programme. This could be either integrated into the programme as described above or as a specific issue where local organisations can identify how to use their combined resources to generate efficiencies in delivery of adaptation measures.

11 December 2009

Witnesses: **Lord Smith of Finsbury**, a Member of the House of Lords, Chairman and **Dr Paul Leinster CBE**, Chief Executive, Environment Agency, gave evidence.

Q160 Chairman: Good morning and a warm welcome to the Committee. Our apologies for keeping you waiting. May I say that not only are you extremely welcome here this morning—and I know that we all appreciate the fruitful, informal dialogue we have had with you and indeed many of your staff in the last few months; but we also appreciated the use of your nice boat to go and visit the Thames Barrier just before Christmas, with some of your staff, which was an extremely interesting visit. I am afraid everyone got rather cold because I insisted on sitting outside at the back of the boat all the way down there. Welcome. Can I ask you a general question to start with: how well placed do you think

Britain is to manage the very significant impacts which climate change is going to have on the country?

Lord Smith of Finsbury: Thank you very much, Chairman, for your kind remarks and for the opportunity to meet the Committee. In answer to the question: I think reasonably well placed but we need to remain vigilant. The policy framework which is in place—the Climate Change Act, the adaptation reporting requirements, the work that the Environment Agency is charged with doing on flood, on water resources and on biodiversity, all put us in a reasonable place to understand what is coming down the track at us from climate change and how

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we are going to have to respond. Having said that, it does require a continued engagement from government and parliament and it requires sustained funding, especially in the area of flood risk management and flood defence, in order to make sure that we continue to meet the challenges.

Q161 Chairman: What, for example, did we learn from the lessons of the floods in Cumbria last year?

Lord Smith of Finsbury: I think we learned some positive lessons and also some lessons that we need to develop further. The positive lessons are that the new flood forecasting centre, which has brought the Met Office and the Environment Agency together in one place—the meteorologists and the hydrologists working in the same place and at the same desks—was very successful in identifying the event two or three days in advance; putting the warnings in place in good time and so on. The work that we had done to protect Carlisle was very successful and the temporary work which we did to fill the gap, which was not yet ready in Carlisle, did ensure that there were no properties affected by the flooding in Carlisle—in great contradistinction, of course, to what had happened in 2005. The lesson, though, I think that we do need to learn—and everyone needs to learn—is that the Cumbria event was a very extreme event; the highest concentration of rainfall in one location in England over a 24-hour period since records began. What we know from the science of climate change is that weather patterns are going to become more extreme, and we are going to see more events of this kind—very concentrated rain. What that means is that some of the traditional ways we have talked about preparing for flood defence—one-in-100-year events, one-in-1000-year events—will cease to be as meaningful as they perhaps were some years ago. The risk is going to get greater and we need to up our game in response to that.

Q162 Chairman: That is very interesting. It is clear that the profile of adaptation has risen and no doubt the recurrence of extreme weather events will ensure that profile remains high, certainly not just within central government but I guess amongst the public generally. How do we make sure that with a higher profile that actually feeds through to making more progress on tackling adaptation issues, and particularly in the context of what is clearly going to be a period of very, very severe restraint on all areas of public spending?

Lord Smith of Finsbury: We have to try and square a circle with ever greater constraint on public funding and maintaining a good forward programme of flood defence work and flood risk management work. All the time we are looking at ways of achieving savings, making our flood defence work more efficient; we are learning all the time about new ways of doing flood defence; so upstream flood storage is much cheaper than building huge great concrete walls and sometimes more effective. We need to look in each particular location at what is going to work best and how we can achieve the best value for the public purse. Just one other thing I would say is that we need also to look beyond just

relying on the public purse and the more that we can bring other partners into the funding of flood defence work the better.

Q163 Chairman: Like developers and so on?

Lord Smith of Finsbury: Like developers, local authorities, Regional Development Agencies, as long as they exist, and indeed others.

Q164 Joan Walley: Can I just add to that? You are talking about a change in the way that we see things and there is a lot of talk just now about the new green economy, but for the purpose of investment in the infrastructure, which adaptation would need, are you saying that there needs to be a change in the way, for example, the Treasury, BIS Department and other departments view public investment so that there needs to be a step change away from GDP towards the more sustainable definition of GDP?

Lord Smith of Finsbury: On the big question at the heart of what you ask there my personal response would be yes, absolutely; we need to have a much better understanding of the true nature of individual citizens and communities' well being, and GDP does not always reflect that. However, we are stuck with making the case at the moment under a system where the Treasury look at GDP.

Q165 Joan Walley: But if where the Treasury looked at GDP changed and it really revised the so-called Green Book, to be a truly Green Book, would that not make it possible for you to find other means and sources of funding that would fund the essential work that you are saying is necessary, where we have to be innovative?¹

Lord Smith of Finsbury: It would transform an awful lot, including the way in which we were able to make the case. But the key thing I would say is that even under the present system of GDP the case for flood defence is very strong. The cost-benefit of any flood defence work that we do—the benefit is at least five times the cost. The average cost to a home of being flooded is £20,000 to £30,000. The average cost to a home of being burgled is about £1000. So the damage that flooding does in terms of its impact on people's livelihoods is huge and the more that you can protect against that then the economic savings is enormous.

Q166 Joan Walley: Just to complete on this, my point as well was that if we are talking about prevention and if we are talking about the precautionary principle, how are you saying that that should be given a weight within the investment decisions that have been made by other government bodies in terms of public expenditure? Is this not giving less focus on the precautionary principles, which is not really where it should be at the moment if we are really going to tackle this agenda?

Lord Smith of Finsbury: I think the more that we can make the case about the prevention of potential damage, which is the precautionary principle writ large, the better, yes.

¹ HM Treasury, *The Green Book: Appraisal and Evaluation in Central Government* (and Supplementary Guidance)

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Q167 Chairman: What role do you think the Adaptation Sub-Committee of the Climate Change Committee is going to play in all this?

Lord Smith of Finsbury: I think it has the potential to play a very positive role and it has made a good start. It is early days yet, of course, but we as an agency very strongly supported the proposals that emerged from Parliament for including the Adaptation Sub-Committee in the mix alongside the main Committee on Climate Change. Putting upfront the need for adaptation which the Committee will enable to happen is a very positive thing. You and your colleagues will know only too well that even if, as a world, we stopped emitting all carbon dioxide tomorrow climate change effects would carry on happening for 20 or 30 years; and even with a two degree rise in average global temperature, which we hope we will be able to hold things to, even with that, there is going to be a need for adaptation to take place. The more that fact can be put up in front of the public, the better.

Q168 Mr Caton: In your work is there a trade-off between investing in adaptive capacity by developing skills and knowledge on the one hand and taking action to adapt to specific climate impacts by addressing identified risks on the other? How do we get the balance right?

Lord Smith of Finsbury: We obviously need to do both. I am going to ask Paul to answer this.

Dr Leinster: On the skills agenda we are working with local authorities and with others on a foundation degree for flood risk management. We recognised that there was a need for people with additional skills, specifically in civil engineering, which address flood and coastal risk management. We have established a course with the University of West of England and we are putting people through that course and we also have people going through it who are sponsored by local authorities. So that is one strand of the work, making sure that that capacity is there. Then there is the work that we do, which looks at particular flood risk and water resource stresses and strains and what needs to be done to address those. Then there is the work that we also do, which is again working with things like the utilities and getting the utilities to take adaptive measures to protect critical infrastructure, and on that work we are working closely with the Cabinet Office.

Q169 Dr Turner: Lord Smith, your agency has come up with some fairly large round numbers for annual expenditure needed to invest in flood defence work. How difficult was it to arrive at these figures, which are obviously measured against future risk? But then risk is something which is changing and, as you have already pointed out, with the unprecedented volume and the concentrated period of the Cumbrian rainfall hazard it appears to be entering into a new and totally unpredictable dimension. So how certain are your predictions?

Lord Smith of Finsbury: The predictions we made in the long-term investment strategy work that we have done, we have looked at the UKCP09 figures,² which are the best that we have to go on as far as likely impacts in the UK are concerned, and we have worked very carefully through those, assuming the impacts that are likely to arise from that in order to determine what levels of investment we would need over a 25- or 30-year period in order to maintain the current level of protection for properties across England and Wales. We have then gone and talked to the Treasury and the Treasury have crawled all over our figures and have agreed that our working is absolutely in order and have agreed with the conclusions that we have reached. What they have not done, of course, is commit the actual figures and that is unlikely to happen this side of an election or, I suspect, the other. But the working of the best predictions we can make—and of course these are predictions, we cannot guarantee them—they are predictions about what we believe is going to be needed in terms of investment going forward to provide the right levels of protection. If I might add one other thing. One of the most interesting pieces of work we have done as an aside from the long-term investment strategy is the Thames Estuary 2100 work where what we have done is taken a number of different possible scenarios and we have said, “This is how policy would need to adapt depending on what actually happens on the ground.” What I think we need increasingly to be able to do is to come up with strategic responses for investment going forward that can adapt to actual impacts on the ground as we find exactly what is happening as a result of climate change rather than just relying on predictions.

Q170 Dr Turner: As you have already pointed out, you do not have Treasury commitment to providing your figures and, knowing the Treasury, you may never. If you do not get the doubling of spending up to 2035 that you want to see, what do you think are the implications for the country and for the country’s economy, especially given the financial impact of flooding to which you have already referred? Multiply that to a national scale and what do you think are the implications for further Cumbria-type events possibly covering even a bigger scale, bigger areas? Just how bad could the financial damage be if you cannot get the investment that you need?

Lord Smith of Finsbury: If the investment does not go in then fewer properties will be protected. It is a very clear equation that when each Government comes along we will have to make and spell out to them, “Here is the level of protection you get for a particular quantity of investment. If that investment is not put in place then you are going to have to be honest with people and say that the level of protection will be lower.”

Dr Leinster: What we found in the long-term investment strategy is that currently about 500,000 properties are at a one-in-75-year risk, so they are at

² UK climate projections

significant risk of flooding. If you want to keep that number steady, so maintain the level of risk over the next 25 years, then you would have to, as you say, double the amount of money that is going in to construction of new defences. If you do not and you hold it at the same level as it is now, then the number of houses at significant risk doubles. As a country if it is thought that 500,000 properties currently at significant risk is too great then the amount of money required is even greater. So one of the things we are proposing with our long-term investment strategy is to keep it under review so that as we see what is actually happening with climate change then we are able to adjust those figures.

Q171 Dr Turner: If investment is delayed does it mean then that necessary flood defence works become more expensive?

Lord Smith of Finsbury: Inevitably the cost of construction rises in normal circumstances. We have been through a rather odd patch over the course of the last year and a half but, on the whole, things will be more expensive the more they are delayed. Of course climate change marches inexorably on, so the need is going to become more urgent as we go further into the future.

Q172 Dr Turner: How helpful are the latest climate change projections? How do they help you and how do they help other organisations that need to be involved in the planning?

Lord Smith of Finsbury: The UKCP figures that emerged six or seven months ago are helpful in providing an agreed benchmark to which everyone is able to work. As we have said, they are the best predictions that can be made but they remain predictions, which is why, having adaptability built into policy making as you go forward, and into the strategies that you put in place so that you can adapt to what actually happens on the ground is, I think, a very sensible way to proceed.

Q173 Dr Turner: What helpful changes can you see in the way that climate change is projected?

Dr Leinster: If you look at the previous UKCP it was at a very broad scale. The current UKCP09 has provided detail which enables us to look at a regional basis, and I think that the further development will be able to predict at a sensible but more local level because we work on catchments, so we need to understand what is happening at a catchment level. But it is always important to note that rainfall falling in slightly different places spatially will have significantly different impacts on communities.

Q174 Joan Walley: In respect of the spending on flood defences and how you are going to ensure that there is sufficient funding there to pay for all that is needed for that one-in-75-year risk, can I ask what kind of pressure the insurance companies are bringing to bear, because presumably they have such a huge interest in this and so do they have any say? What sort of engagement do you have with them because I would have thought that that was an important element of all of this?

Lord Smith of Finsbury: We have a very close dialogue with the insurance industry. Following the floods of recent years they put in place a Statement of Principles, which they agreed with the Government and, effectively, what that is is a bargain that says provided the Government, through the Environment Agency, invests properly in flood defence work across the country they, the insurance industry, will continue to insure existing customers. Even where a property has been flooded or is at flood risk they will continue to provide insurance cover to them. That agreement lasts until 2013 but it does provide an added bit of pressure on the Government and the public purse because if there is a sudden diminution or withdrawal of money for flood defence work then the insurance industry will understandably say, "Sorry, the bargain is being broken."

Q175 Colin Challen: You have mentioned already the need to identify extra sources of income in the light of the austerity programme that we are all facing over the next ten years, and local beneficiaries of flood protection work clearly might be a suitable case in point. Do you have any proposals in mind about how to extract more money from the local beneficiaries of flood protection work?

Lord Smith of Finsbury: I would put that into two potential categories. One is the people who will directly benefit in terms of protection for their properties. This is particularly important where you have perhaps a very small number of properties which require some form of protection but where any cost-benefit analysis would simply not provide sufficient benefit for the cost of providing defence, and in those circumstances on a number of occasions in the last couple of years now we have worked very closely with the property owners concerned and tried to put together a package of funding which enables them to put some money in. They may seek some funding from the local authority as well. We can put a bit of money in but not the cost of a whole all-singing, all-dancing permanent defence. Because we help the self-help process of the property owners concerned we are able to come up with a good scheme with which they are happy and which they have been part of putting in place. Increasingly, in the small and scattered communities around the country that is an approach that we will want to develop. The other way in which this can happen is where putting flood defences in place enables development to happen behind the defences. Recently in the centre of Ipswich, for example, we put some new harbour defences in place and that has enabled the development of a university campus, some commercial properties, some residential properties to happen on Ipswich Harbour which would not previously have been possible. What happened was a combination of Environment Agency funding, funding from Ipswich City Council and funding from the developments that was put in place in order to provide the protection. Increasingly I think we will see that sort of approach happening as well.

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Q176 Colin Challen: Are you having discussions with the insurance industry? I am sure you are. Are they proving to be effective partners in tackling this problem?

Lord Smith of Finsbury: In one or two specific localities they are. We have also had some quite fruitful discussions with some of the insurance companies about the degree of resilience which is enabled to be put in place for properties that have been flooded and are being restored back into a habitable condition, rather than just putting them back as they were; building in very simple resilience measures like protection for the door threshold, covers for air bricks, electrics up at a higher level, waterproof plaster and so on, relatively simple things which can make a world of difference if there is another flooding event.

Q177 Colin Challen: Where local authorities have in the past approved housing developments, say, on floodplain areas or areas of known risk and then that area suffers a flood, should the authority pay any kind of retrospective penalty, do you think, for having committed what was a risky development in the first place?

Lord Smith of Finsbury: I do not think we would be thanked by local authorities for insisting that they paid a penalty. However, we would want to make it increasingly clear to local authorities that there will be some locations where it would be very foolish to permit development to take place. There may be others where the pressure for development is so great that a local authority will nonetheless decide they are going to go ahead, but my second best option in such circumstances would be to say, "Okay, if you are going to permit the development to go ahead then for heaven's sake insist that the developer builds in resilience to the properties that are constructed." Where we would absolutely maintain our opposition in undying fashion would be if a development created additional flood risk for other places, which sometimes, of course, the creation of a development can do.

Q178 Colin Challen: In finding new sources of funding do you think that the Environment Agency needs any additional powers?

Lord Smith of Finsbury: I do not think so is the answer to that.

Q179 Colin Challen: So it is a very cooperative world out there then, I guess.

Lord Smith of Finsbury: It is cooperative and there are times when I wish, for example, that the insurance companies would be readier to adjust premiums in order to reflect levels of resilience in properties and in order to encourage better resilience to be put in place. I think the insurance world has a bit further to go on that. I would much rather work by cooperation and persuasion with them than by seeking new powers.

Q180 Colin Challen: Finally, given the fact that we are all responsible for climate change, to what extent should local people in particular areas have to face

much higher costs themselves? Should it not always be spread out across the whole country, as it were, the finance requirement?

Lord Smith of Finsbury: Of course the great bulk of expenditure on flood defence, on water resources and so forth is indeed spread out across the entire country because it is funded through general taxation. There are also places where there is a very particular impact and a very particular benefit to be derived and in those circumstances I think some contribution, especially where development is taking place that is new and that would not otherwise be possible, is fair.

Q181 Chairman: If I could press a little on the question of where development is planned in areas where there is a degree of risk. Since the cost of reacting afterwards to flooding problems is at the moment at least partly borne by the taxpayer or by you, therefore in terms the general taxpayer, would it not be helpful to be able to say that if development did take place in an area where you were particularly concerned and you have got a role as a statutory consultee the costs of any remedial work would then have to fall upon the authority which gave the consent for development in this rather risky location?

Lord Smith of Finsbury: If a development has taken place against our express advice the first thing that will potentially happen is that it will be impossible to insure the properties against flood risk and that, of course, immediately imposes potential extra costs on the owners of the properties. Again, I think focusing on the authority that gave the permission rather than, for example, on the developer who insisted on going ahead and doing the building might not be the right place on which to focus.

Q182 Chairman: On both of them perhaps in that case?

Dr Leinster: One of the issues that we also come across is pre-existing planning permissions, so these are historic. That is a particular issue.

Q183 Joan Walley: Picking up on this whole issue of existing land use and what was just said by the Chairman, one of the issues would be that it would assume that the Environment Agency had been properly consulted in respect of planning applications or even change of use and my experience is that quite frequently the Environment Agency is not fully formally consulted and it is very much an ad hoc process. Certainly that has been the case in some cases in Stoke-on-Trent. Would you feel that there should be greater emphasis on the role of the Environment Agency as a formal consultee in respect of all planning applications? Do you see what I mean? It often gets overlooked or comes in as an afterthought.

Lord Smith of Finsbury: We are a statutory consultee. What I am not sure about is if it is not in a floodplain: if there is no perceived flood risk I am not sure that there would be a particular point in insisting that we were consulted because we would

simply say “We do not believe there is a flood risk here”, but if there is a potential flood risk we have to be consulted.

Q184 Joan Walley: I was really just trying to focus on the relationship between planning and the Environment Agency and I feel sometimes that is a process which needs to be firmed up. It is a bit too ad hoc on occasions.

Dr Leinster: I think it has developed well over recent years and I think if we were to look historically I would agree with the position; but I think that we have worked very closely. We now have standing advice that we give out to all local authorities and our relationships with all local authorities now, their planning departments, are very good. The latest figures we have are that in 96% of cases local authorities have taken our advice into account and have followed the advice that we have given. We also have a call-in provision where we can get the planning permission called in for scrutiny by the Secretary of State and we have done that on occasions.

Q185 Joan Walley: And you are monitoring the effects of that especially in respect of the 4% where the 96% has not applied it. Can I just move on to the new planning guidance? I know that the Environment Agency has been very focused on the new arrangements which have come in as a result of the legislation that has just gone through Parliament in respect of regional spatial planning and that new legislation requires attention to be given to climate change. I am very much aware that that guidance has not yet been issued as to how the Regional Development Agencies will take on board a regional strategy and I just wonder what you hope will come out of the new planning guidance insofar as it relates to adaptations.

Dr Leinster: We have worked very closely on the regional spatial strategies. We are a consultee within the process and in a number of regions we actually chair some of the sustainability or climate change panels that have been set up.

Q186 Joan Walley: In which regions do you chair that?

Dr Leinster: We are chairing the South West, but we sit on all of them. Our voice is heard at that level and I think that we are being quite successful in making sure that climate change is now being taken into account. How far that will then get embedded within the spatial strategies we will yet see.

Q187 Joan Walley: So what aspects do you think should be embedded in the new regional strategies and planning guidance? You mentioned the South West and I know, because of Jonathon Porritt’s involvement, that that perhaps is state of the art in respect of sustainable development. Do you have best practice that has arisen out of your involvement in chairing that which would apply to the other regional areas under new legislation?

Dr Leinster: One of the things that we do is actively share our experience across the Environment Agency, so we pull together all of the people who work on climate change at a regional level and make sure that the lessons learned from one place are applied to another.

Q188 Joan Walley: But, specifically, is the Government recognising that in its preparations for the new planning guidance that is about to come into effect? If that planning guidance is not absolutely encapsulating what needs to be included in terms of adaptation we will all have missed the boat, will we not? What needs to be in that planning guidance?

Lord Smith of Finsbury: You are right to identify the need for adaptation to climate change to be embedded in the guidance and that means, amongst other things, flood risk, changes to the coast—erosion, flood risk and so on from coast—levels of water resources, what is likely to happen to flows in rivers regionally, water efficiency standards, codes for sustainable homes and sustainable building, green infrastructure. There is a range of elements which are essential aspects of adaptation to climate change that need to be absolutely embedded in the regional strategies, and that is the case that we are making very strongly both at regional levels on the committees on which we sit, but also to government more generally.

Q189 Joan Walley: You submitted an additional piece of evidence on the Total Place, which is a new government initiative that is looking to pool resources and to join up places. How does that relate to the need for adaptation and also the precautionary work of the Environment Agency as well? How do you see you having an input into that, given that in its pilot early stages that programme appears not to have included the issues that we are discussing here?

Lord Smith of Finsbury: The Environment Agency has not been labelled as part of the Total Place programme, but we had been involved in the pilot.

Q190 Joan Walley: Should it have been? Is it an oversight that it has not been? Would you have liked it to have been?

Lord Smith of Finsbury: There are some aspects of our work which absolutely, yes, must be part of the Total Place approach. It is, however, slightly more complicated than in relation to some other public services. The most obvious example is a river will flow from one Total Place to another Total Place and what happens to that river in one may have an impact on the other. We have to look both in terms of what happens in a specific location but also what happens over a much wider catchment area and try and relate the two together. In terms of engagement we have been engaged in the various pilot projects that have been happening.

Q191 Joan Walley: Are you confident that any future announcements about Total Place will have regard to the need to ensure your key involvement in it?

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Lord Smith of Finsbury: I am optimistic.

Joan Walley: We will watch this space then!

Q192 Mr Chaytor: Can I move on from flood risk to coastal erosion and ask if the same principles of cost-benefit analysis apply or is coastal erosion completely different?

Lord Smith of Finsbury: The same principles apply and what that means is that whilst our wish is to try and defend as much of the coast as we can there will be some parts of the coast where probably we will not be able to use hard defences to defend in perpetuity.

Q193 Mr Chaytor: In that cost-benefit analysis what are the respective weightings given to economic factors or environmental conservation, biodiversity issues or simple issues of social justice, people losing their homes for example?

Lord Smith of Finsbury: People's homes tend to be absolutely at the top of the list with economic benefit fairly close behind; and biodiversity fairly close behind that, partly because of the legislative framework in which we have to operate with the Habitats Directive and other Directives.

Q194 Mr Chaytor: Is there a rigid methodology that is statistically robust and publicly available? It is a little behind economic factors, but how far behind them?

Dr Leinster: The weighting is according to Treasury guidelines and there is a methodology that they lay out which gives you those various weightings, and we could give information.

Q195 Mr Chaytor: Could you give us some concrete examples? If you are comparing, for example, the need to protect two houses on the cliffs above Scarborough as against an enormous area of wetland in the Fens with great biodiversity importance, where would you invest your resources?

Lord Smith of Finsbury: Without the absolute specifics in front of us it would be very difficult to answer the question. I suspect that the value of the wetland would be rather well represented by the framework of Directives in which we have to operate. Let me give you perhaps a more exact example. The town of Southwold in Suffolk has a large number of properties of a very substantial economic benefit. We have recently, together with the local authority, done quite a lot of defence work in order to assist the protection of the town of Southwold and I suspect for many years to come the same imperatives to defend the town of Southwold will be very strong because the cost-benefit analysis is very clear. Just to the south of the town of Southwold is the Blyth Estuary, which also faces very substantial threat from the sea. There are, I think I am right in saying, 24 properties in the immediate risk area around the Blyth Estuary. It would cost something like £32 million to provide robust 100-year defences for the Blyth Estuary; and the cost-benefit analysis, fairly obviously when we are talking about rather precious public resources, simply does not work there. So what we have done

instead is we have sat down with the residents of the Blyth Estuary and we have worked out with them a way of moving forward with a bit of funding from the Environment Agency, but nowhere near £32 million, together with some of their own resources, together with some self-help, together with some work from the Highways Agency, so we can find a way forward with them. Increasingly we are going to have to take that sort of approach where the very obvious cost-benefit calculation that might apply with Southwold does not apply.

Q196 Mr Chaytor: Those are two very interesting examples, but is that generally understood by all communities on the vulnerable east coast? You have mentioned the Treasury guidelines and the cost-benefit analysis, but is there a map of the east coast identifying the areas most vulnerable to coastal erosion?

Dr Leinster: Not yet.

Q197 Mr Chaytor: And indicating which communities will have to be sacrificed and which communities will be supported?

Dr Leinster: Just now we are carrying out a programme of shoreline management plans. A number of those are out for consultation. The vast majority of those are, in fact, being led by the local councils, not by ourselves. There are 22 which cover England and Wales; we lead on four and local councils lead on 18. Those plans have extensive engagement with local communities, but these are very difficult issues and cause a lot of discussion.

Q198 Mr Chaytor: Do you feel that there will come a point, once this process has been completed, where it will be necessary to be absolutely upfront and put a map in the public domain?

Dr Leinster: As part of that process what we are looking at is on a plan-by-plan basis and as the plans come out for consultation there is a map associated with the plan. It is an interactive map and people are able to look at it and interrogate it and get further information about what is going to happen in their particular circumstance. Again, as we were talking in terms of forecasting and predicting, it is not possible to say that there is going to be this amount of erosion in this place and it is going to affect these streets, it does not happen that way, but it gives general indications of the sort of amount of erosion that we think will happen.

Q199 Mr Chaytor: Finally, on the question of individual properties, the Defra figures suggest that maybe 2,000 properties will disappear through erosion over the next 20 years and that is about two a week over a 20-year period.

Dr Leinster: There are 2,000 at risk, of which we believe 200 might be impacted, but it is not possible to say which 200 out of the 2,000.

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Q200 Mr Chaytor: So impacted means destroyed.
Dr Leinster: Destroyed, yes.

Q201 Mr Chaytor: Of the 200, what is the public liability to the families living in those 200 properties? Is this entirely an issue for them and their own insurance policies or do you think that there is a public responsibility here?

Lord Smith of Finsbury: I am afraid that at the moment as public policy stands it is their risk and their responsibility. Defra have recently started consulting on a coastal change programme which envisages that there might be some financial assistance—at the moment in their view of very limited nature. It has long been my view, certainly personally, that especially where a property has been in the ownership of an individual or a family for a very substantial period of time and when it was originally bought without any obvious threat from coastal erosion, but where coastal erosion has now come to a point where it might well remove the entire property and the livelihood of the family concerned, there ought to be some means for providing compensation. Whether the development of an idea that Defra has floated of a sale and leaseback arrangement in the interim might be one of the ways forward is something that I will keep on pressing ministers to consider, especially as we are talking about a relatively small number of properties. Obviously where a property has been purchased very recently in the full knowledge of the threat from erosion then the same should not apply.

Q202 Chairman: Southwold, which is in the constituency next door to mine, is very appreciative of your decision and support and I think has perhaps already identified some additional investment going in as a result of that. Perhaps even more appreciative of that than it was of the decision of the Prime Minister to take his holiday there recently. Can you tell me whether your decision to support Southwold was taken before or after the Prime Minister's holiday?

Lord Smith of Finsbury: I think both before and after because this has been a developing process and, indeed, it is not a subject that I have discussed at all with the Prime Minister. I have, however, discussed it in great detail with the residents of Blyth, the residents of Southwold and your colleague who represents them in Parliament.

Q203 Joan Walley: Can I press you a little further on this because I am very much aware of the huge posters, "Gord help us", which were there in Southwold and which presumably were there to support the people of Blythburgh as well, and it is clearly important that Blythburgh gets the investment as well as Southwold because there is a link between the town and the surrounding marshland area. I am also very conscious that that is a very, very articulate, very confident, very resourceful community. I compare that with other parts of the country where there is not the same amount of resourcing capacity, and I wonder what the Environment Agency is doing to make sure that

people elsewhere in the country, where there is not that capacity, can actually learn from the way in which Southwold and Blythburgh put forward their arguments to the Environment Agency in this most successful way.

Lord Smith of Finsbury: Just to be absolutely precise, the village of Blythburgh itself, because it is up on a slight hill, indeed with one of the most gorgeous churches in the entire country—

Q204 Joan Walley: I know it well.

Lord Smith of Finsbury: --- is actually not at risk. It is down below Blythburgh where the properties that are at risk are. But you are right, the general point that you make is absolutely right.

Q205 Joan Walley: I am sure that the Parish Council of Blythburgh would be very appreciative of that clarification, but do go on.

Lord Smith of Finsbury: The residents of the Blyth Estuary are indeed articulate; they know how to make their case and they have made it very effectively. There will be other communities which are not so articulate where we need to help them to be articulate and share with them the knowledge that we have and the issues and help them through the decision-making process. Increasingly I am keen that the Environment Agency should take that approach at a local level, working with communities.

Q206 Joan Walley: Do you have dedicated resources for that? Have you identified where those communities might be where you need to be putting in extra resources specifically for that capacity building programme?

Lord Smith of Finsbury: Yes, it is an absolutely fundamental part of our new corporate strategy going forward. I have made it very clear that it is a real priority for the agency to put resources into working with communities in facing some of these environmental challenges.

Q207 Joan Walley: I think the Committee would like to see where those resources are being put in.

Dr Leinster: We have appointed in the last year coastal engagement officers and there are a number of staff whose specific task is to engage with communities around things like the shoreline management plans to make sure that people are aware. If you look further down that east coast to a place called Jaywick, where again we put defences in, that is an entirely different community, that is quite a deprived community. So we are working both in deprived communities and those which are better off, but engaging fully with local communities and developing plans for their communities.

Q208 Colin Challen: You have argued that adaptation should form a key part of sustainable development frameworks. What are the benefits of putting adaptation in that context?

Lord Smith of Finsbury: What it does is to help to embed adaptation issues in the planning of companies, organisations and government departments. One of the things that are quite helpful

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in this is that there is now going to be a requirement for adaptation reporting from something like 100 major companies and organisations, and as a new aspect of sustainable development I think that is going to be very valuable.

Q209 Colin Challen: One of the unintended consequences of doing this might be that we start identifying costs that previously we had not identified and that then inflates the funding demand. What are we going to do then if we have this embedded in SD frameworks but then find that we do not have the resources to do as much as we would like to about it? Is that a problem that we are just going to have to live with?

Lord Smith of Finsbury: I would rather—and I suspect the chief executives of major companies too—know exactly what the likely challenges they were going to face were rather than pretending they did not exist, even if that makes the decision-making tougher going forward.

Q210 Colin Challen: People may think that policy makers are being negligent then if they are prepared to identify the risk but then do not have the capacity or the will to match it.

Dr Leinster: But if the risk crystallises so that there is an impact then I think policy makers who knew that there was a risk but had not informed anybody there was a risk would be in an even worse position.

Lord Smith of Finsbury: It might also help to concentrate a few minds on the need for mitigation as well as adaptation.

Q211 Colin Challen: Can we take it that the Environment Agency itself has now embedded adaptation in its own SD frameworks?

Lord Smith of Finsbury: Yes, absolutely.

Dr Leinster: We have to write an adaptation report, as you would be aware, and a number of other authorities have to write adaptation reports. We are going first and will be using it as a learning experience with Defra to actually work out what should be contained within a report such as that. Then what we hope is that we will be able to provide additional guidance to help others as they come behind us.

Q212 Colin Challen: Do you feel that the Government and its other agencies are doing the same thing; that they are actually rising to the challenge?

Lord Smith of Finsbury: I think they are perhaps waiting for us to go first. I am absolutely sure that they will follow on well, behind. I think they are anxious to see us do the template.

Q213 Chairman: We are getting a bit short of time so could I just wind up with a general question? It is clear that the adaptation issues are relevant to as wide a range of government departments as the mitigation issues, it is very much a cross-cutting area which goes much, much wider than just Defra. Do you think that the Cross-Whitehall Programme Board is strong enough and does it have enough levers to drive the changes and to get the buy-in at a senior enough level to ensure that all departments that have to be actually addressing adaptations sufficiently seriously and urgently?

Lord Smith of Finsbury: I have to be honest and say that I think it is a livelier issue for some departments than others. Preparation is more advanced in some parts of Whitehall than others. I think there is a general recognition across government at Cabinet Office and Number Ten level that this is serious and needs to be seen as a priority; but there probably needs still to be a little bit of encouragement in places.

Dr Leinster: I think the test of that will be in the adaptation reports that they have to prepare.

Chairman: It may be too much to tempt you to indicate which departments you think are less enthusiastic in their consideration of the issue, but any help that your staff are able to give to mine in enabling us to write a report which might identify some of the slower movers would be much appreciated, even if it was off the record.

Joan Walley: I do not see why we could not have them named.

Q214 Chairman: If there was a naming of course we would be delighted.

Lord Smith of Finsbury: I think we would prefer to have a subsequent discussion.

Chairman: That is fine. Thank you very much for coming; it was a very interesting and useful session from our point of view.

Supplementary memorandum submitted by the Environment Agency

A. EMBEDDING ADAPTATION

How big a challenge has it been to embed adaptation into the Environment Agency's mainstream business management processes? How long has it taken?

We have had a formal adaptation strategy since 2005, and have developed a good understanding of the main threats and opportunities that climate change poses to our business. Climate change allowances for flood risk and sea level rise have been integrated into the Defra/Environment Agency Flood Risk Appraisal Guidance since 1999.

Our approach has evolved over time, from integrating adaptation into policy specific issues, to developing climate change risk assessments and individual action plans for each of our core policy areas. We currently have fourteen functional Adaptation Action Plans embedded across the business.

As part of our strategic approach to adaptation, and to build capacity within the Environment Agency, we have a well developed communications and evidence programme, including:

- A climate change science programme.
- A climate change training programme.
- An annual internal climate change conference.
- A climate change briefings series, summarising our key work.
- Quarterly meetings with operational staff leading on climate change.
- A monthly climate change bulletin.

We are now developing integrated climate change risk assessments and an integrated adaptation programme, which will bring together the 14 functional adaptation plans. This will form the basis of our report to Defra under the Reporting Power (given in the Climate Change Act 2008).

Some departments are just beginning to address climate change risks. What learning points would you draw out for them?

We would suggest that there are five general principles as set out below:

- Leadership: Make sure that there is high-level leadership and that this is both visible and meaningful, supported by resources, training, and skills development.
- Use existing processes: Exploit existing business processes and risk management to ensure that key teams and individuals are actively engaged and able to deliver actions. Avoid adaptation being thought of as a standalone activity just done by a specific group of people with adaptation in their title. Adaptation thinking has to be incorporated into all work areas and activities.
- Learn from others: Begin by reviewing what others have done and develop knowledge and ideas from existing examples of good practice.
- Be proportionate: Take a risk-based approach to planning and action. Be explicit about the organisation's attitude to risk and risk management goals.
- Address uncertainties: It is not possible to predict with certainty future climate conditions and possible impacts and risks. Use scenarios and build in flexibility to adapt to observed changes which confirm, or otherwise, climate change planning assumptions. It is important to understand the uncertainties and what their implications are so that informed decisions can be taken.

B. SKILLS GAPS AND SHORTAGES FOR ADAPTATION

Does the country have sufficient skilled people to deliver the adaptive action necessary to address risks from flooding, drought and coastal erosion? What are the main gaps in skills?

The UK currently has some skills shortage in engineering, land use planning, science and technology. These are skills which will be essential for delivering adaptation. It will be individuals with skills in these areas that will need to gain specific knowledge and expertise on adaptation matters.

Many aspects of Flood and Coastal Risk Management require strong engineering and technical skills. The Environment Agency has over 3,700 employed in planning and delivering Flood and Coastal Risk Management, most of whom require technical skills, ranging from NVQs across the manual workforce, through to PhDs and corporate membership of professional institutions. Over 250 of these staff have chartered engineer status with 600 being directly engaged in the planning and management of flood defence assets.

Although some skills gaps do exist in certain areas the Environment Agency has developed and implemented a comprehensive Skills Strategy over the past few years to help develop and support engineering skills. This includes the Foundation Degree in River and Coastal Engineering we have established, run in partnership with the University of the West of England. In September 2009 this course was extended to include its first intake of 22 local authority trainees through Defra's Capacity Building initiative.

We also supplement the skills people bring to the Environment Agency with additional training and support. We believe many of the specific skills in these areas are best developed vocationally rather than through an exclusive reliance on formal education. It is, however, essential that the quality and numbers of people with the underpinning science, technology and engineering is maintained and in some areas enhanced. Key areas for improvement include the supporting sciences of hydrogeology and hydrology.

The Environment Agency will continue to benefit from the technical skills bought-in through its framework contracts with consultants and contractors. The Environment Agency is keen to work collectively with these consultants and contractors to improve the longer term resilience of the necessary key skills in England and Wales.

Local Authorities now have an extended role in managing local flood risk. Ensuring the skills are in place in Local Authorities will be key to them being able to deliver their role. The skills required will be similar to those mentioned above. At present it is difficult to establish the current skills base in the over 400 Local Authorities. However, a sample assessment has identified two main issues. The first being the lack of overall capacity and the second is the age profile. The resource pool of skilled and experienced individuals will reduce in the next five to 10 years due to retirements.

Professional bodies and trade associations also have an important role to play in providing advice and guidance, and in continuing professional development. The Chartered Institution of Water and Environmental Management (CIWEM) and the Institution of Civil Engineers (ICE) are actively thinking about how they can contribute to this agenda.

C. WORK WITH COASTAL ENGAGEMENT OFFICERS

We have employed coastal engagement officers specifically to help communities understand the risks they face from both coastal flooding and erosion as climate change increases the scale of the problem. We have had positive feedback on this from Local Authorities and we are continuing to build our partnership working in these areas.

D. WORK WITH COMMUNITY ENGAGEMENT OFFICERS

Eight engagement officers have been recruited to work at a community level in one Local Resilience Forum (LRF) area per region. They are engaging with local communities and individuals in areas at risk of flooding to raise awareness, develop skills and to empower individuals and communities to take action to manage their flood risk.

The work of the engagement officers will have major input into our development of best practice and recommendations on future ways of working with communities and local partners.

Their work to date has resulted in more than 30 new community flood plans being developed and over 11,000 people within the most vulnerable and most at risk sectors of society have been informed about flood risk. Additionally, the officers have worked in partnership with many public and third sector organisations, such as Help the Aged and Housing Associations. This approach is reinforcing our flood risk messages through our partners work. The advice is targeted to communities we might not otherwise have reached using existing channels of communication that these other organisations already have.

Positive community engagement was a feature of the November 2009 floods in Cumbria. We have developed a programme known as “Floodwise” which is a national initiative designed to develop and improve our approach to community relationships. Extensive work with local communities since 2005, using such approaches, meant that communities such as Keswick, Kendal and Appleby were actively engaged in resilience issues and many people were able to secure their property and evacuate in a planned, orderly way. In Cocker mouth, with the local fire service, we were knocking on doors along the High Street just weeks before the floods, talking to people about the risk of flooding and what they could do to protect themselves and their property. There were also local meetings to develop community emergency plans.

In the last month alone, engagement officers have:

- Met with residents associations, nurseries and caravan parks in Wales.
- Targeted communications to young families through a flood feature in a local magazine called “*Families*” in the Chilterns and Thames Valley West areas of the Thames Region. Adverts were placed in magazines which were distributed to childcare outlets.
- Held a flood protection event in the South West supported by an article in the local council newsletter.
- Been out knocking on doors in communities in Anglia and Midlands that are at risk of flooding, to engage directly with residents and encourage them to do more to prepare and protect themselves and their property.

E. FLOOD DEFENCE GRANT IN AID ALLOCATION FOR 2010–11

Over £745 million of Defra, Welsh Assembly Government (WAG), Local Authority and European Union (EU) funding will be allocated to reduce the risk of flood and coastal erosion in England and Wales for the financial year up to March 2011. This includes further funding to build new and maintain existing river and coastal flood defence schemes, develop flood forecasting technologies and heighten public awareness of flood risk.

This work forms part of our strategy to reduce the risk of flooding to more than 200,000 additional properties across England and Wales by 2015. Some of the key flood and coastal erosion defence projects planned to benefit from funding in the 2010/2011 financial year include:

- *Nottingham (Midlands)*: £14 million on this £51 million scheme to protect 16,000 homes and businesses along a 27km stretch of the River Trent. The first stage of the works was finished ahead of schedule in January 2010, between Sawley and the River Erewash.

- *Barking and Dagenham (Thames)*: £12 million to improve protection to almost 5,500 properties. This includes the construction of two new pumping stations and the refurbishment of tidal sluices along the River Beam and Gores Brook.
- *Dymchurch (Southern)*: £11.9 million to complete ongoing works on this £60 million sea defence scheme which will contribute towards the protection of over 6,000 properties.
- *Wigan (North West)*: £5 million to construct an upstream flood storage basin and bring improved flood protection to around 600 homes in Wigan.
- *Kinmel Bay (Wales)*: £1.3 million to reinstate flood banks on both sides of the River Clwyd. This work will help protect 1,150 properties in Kinmel Bay and parts of Rhyl.
- *Leeds (Yorkshire and North East)*: almost £0.5 million to progress plans for flood defences in Leeds. The proposed scheme will cost a total of £149 million which is the largest ever planned inland flood defence scheme to date. The completed scheme would increase protection to one of the largest commercial areas in England and about 4,500 homes in the city centre.
- *Morpeth (Yorkshire and North East)*: almost £0.4 million to progress plans to develop flood defences in Morpeth, most recently affected by flooding in 2008. The proposed £17 million scheme is scheduled to start in late 2011 and finish by late 2013, providing increased protection to 1,000 properties.

We welcome the increased Government spending on flood and coastal defences, but levels of funding must continue to increase if we are to maintain the existing levels of protection in the face of rising sea levels and the more intense rainstorms that will come with climate change. We estimate that investment in the building and maintenance of defences will need to increase to £1 billion a year by 2035 (in today's prices) to maintain current levels of protection.

We already seek financial contributions from businesses and organisations that directly benefit from flood defence schemes (such as developers and industries), and will look to increasing contributions from other sources to complement the public investment from Government.

Key schemes completed during 2009–10 include the final stages of a £40 million scheme to protect 3,300 properties in Carlisle. The project, after emergency work to shore up the incomplete sections, protected 800 properties from flooding during last November's Cumbria floods. £4 million of work was carried out on the Hull Tidal Barrier this financial year as part of a £8.3 million maintenance programme to upgrade the structure.

The total spend for England and Wales for 2010–11 is £745 million. Of this, £659 million is derived from Flood Defence Grant in Aid (FDGiA) (Defra), £30 million from Local Levy, £32.2 million from WAG, £3.3 million from EU funds/other income (Wales), £3.9 million from Pitt Actions and £16.7 million from other sources.

In 2010–11 in England our plans include £289.9m on new Flood Alleviation Schemes, £208.6 million on Maintenance of existing assets, £40.3 million on Flood Forecasting and Incident Management, £17.3 million on Development Control, £15.8 million on Flood Mapping and Data Management, £15.4 million on environment and habitats enhancement and £12.4 million on Strategies and Studies.

4 March 2010

Memorandum submitted by the Tyndall Centre for Climate Change Research

INTRODUCTION AND SUMMARY

1. The Tyndall Centre for Climate Change Research welcomes the opportunity to submit evidence to the Environmental Audit Committee's inquiry on the Government's emerging policy for adaptation to climate change. The Tyndall Centre has an on-going programme of research which addresses many issues related to adaptation to climate change at a number of scales. From this, and other research, we have distilled a number of key messages and responded to a subset of the questions included in the Committee's call for evidence:

- Emerging evidence suggests that the climate impacts to which the UK and other countries will have to adapt may be more serious than hitherto thought.
- While focusing on impacts in the UK, the Government must not neglect how the country will be affected by impacts in other parts of the world.
- While the UK approach is comparatively advanced and adaptive capacity is being developed, it is not clear how far-reaching current adaptation efforts by both public and private sectors really are.
- Risks of "mal-adaptation" must be carefully considered by policy makers.
- The Department of Health's heat wave planning is most likely effective at reducing mortality, but vulnerabilities persist among susceptible populations.

- Apart from identifying risks to their own objectives, Departments should consider the extent to which existing objectives remain appropriate, and how far their actions contribute to greater vulnerability in their own or in other sectors.
- The EU has an important role in adaptation policy, in which the UK Government have played, and should continue to play, a constructive role.
- More localised planning, based on novel and inclusive processes, will be needed to engage vulnerable populations such as the elderly.
- Key indicators of the effectiveness of an adaptation action should include robustness to uncertainty and changing circumstances.
- Given the uncertainty in future impacts, most investments in planning for climate change impacts at present are focused on building the capacity to adapt. They are made in response to a range of demands, and so it is not easy to isolate the motivation for adaptation to climate change. These multiple demands for action should be built on to promote sustainable actions which make the UK economy and environment more resilient to future impacts.

BACKGROUND

2. Recent scientific evidence suggests that for any given level of mean temperature rise, the sensitivity of systems at risk from climate change is now greater, and the risk of large scale disruption higher, than previously thought (Smith *et al* 2009). This assessment is backed by similar assessments of “tipping elements” in earth systems (Lenton *et al* 2008). While adaptation will stave off the worst impacts up to a point, we suggest several reasons for concern about the ability to adapt and the likelihood of that adaptation proving sustainable (see Adger and Barnett—forthcoming—for a fuller discussion). These can be summarised as being due to: the possibility that warming considerably higher than 2°C narrows the “window of opportunity” for adaptation; the difference between adaptive capacity and adaptive action; and the risk of “mal-adaptation”.

3. The first reason for concern is that the scale of change and interconnectedness of impacts may be such that the “window of opportunity” for adaptation is smaller than previously imagined. The significant likelihood of mean warming of 4°C or more above pre-industrial levels brings serious implications in terms of impacts (Parry *et al* 2009). As the impacts of climate change increase they are also likely to amplify one another. For example, coastal communities and regions will face sea level rise but also changing coastal ecosystems, changing regimes of coastal storms, and changing freshwater availability all at once. Moreover, the interconnectedness of markets across the globe now means that in many societies the proximate impacts of climate change are not the only stress to plan for. For example, the impacts of climate change on agriculture and fisheries will affect relative prices and availability everywhere, such that adaptation plans that address proximate impacts only may not prepare for some of the more powerful drivers of impacts on people and places.

4. The second reason is that having the institutional capacity and even the available financial resources does not necessarily translate into action. This is a primary lesson from the experience of the impacts of Hurricane Katrina in the US (Repetto 2009). Similarly in the UK, despite changes in weather extremes over the past decades (evidenced through major flooding events such as those of 2000 and 2007), adaptation is not well embedded in planning systems. So although the UK is a pioneer among EU member states in adaptation policy, there is little room for complacency.

5. In terms of implementation of adaptation, findings from the EU-funded ADAM project (led by the Tyndall Centre at the University of East Anglia) highlight the importance of, inter alia, wide-ranging policy appraisal and evaluation frameworks, adequate funding, identifying linkages across sectors and policy areas and the creation of space for learning among stakeholders (see eg Aaheim *et al* 2008).

6. The third reason for concern focuses on the extent to which actions already in place or in the pipeline are sustainable. The concept of ‘mal-adaptation’ captures the sense in which adaptive actions may be counter-productive, either because they are energy intensive and produce increased emissions of greenhouse gases, or else shift impacts or exacerbate problems for another area, sector or social group. Globally, examples of “mal-adaptation” are common in water resource management, flood plain development and the like. In the UK, the first large-scale desalination plant is due to open in 2010 at Beckton, East London. Although it uses more energy efficient technology than such plants have used in the past, its sustainability is questionable.

UK GOVERNMENT POLICY RESPONSE

7. The UK Government’s policy response, including the Climate Change Act and the cross-departmental Adapting to Climate Change (ACC) Programme, is comprehensive, especially when compared to other EU Member States. Comparative research across the EU reveals the relative strength of the UK policy framework in terms of the apparent level of political commitment behind it, its monitoring and mandatory review mechanisms, the reporting power, its recognition of the importance of EU leadership and

commitment to global-level adaptation (Swart *et al* 2009). However, as the NAO's report to the EAC notes, climate change risks are far from being managed strategically and consistently in any Department (NAO 2009).

8. Analysis of an inventory of 340 observed adaptations in the UK collected by the Tyndall Centre as part of a DEFRA-funded project produces similar findings (Tompkins *et al* 2009). A range of adaptations have been taking place in recent years in the UK across sectors and institutions in a broad variety of ways, the majority of which were found in the public sector. It was noticeable that most of the identified "adaptations" are classified as contributing to the creation of adaptive capacity, (ie potential for and the resources to implement adaptation) while actions that are considered implementing adaptation examples tend to be one-off projects or activities by certain institutions (eg the Environment Agency which has a mandate for flood protection) and private firms in the water sector (Tompkins *et al* 2009). Whether the number of adaptations observed should be taken to be reassuring or cause for alarm is open to debate. An optimistic interpretation would be that diffusion of best practice will not be long in following, and that under-reporting and documenting of adaptation means that more action is occurring than is apparent. It should also be borne in mind that since the adaptations shown in the inventory reflect the situation from October 2004–May 2005, many that are recorded as building adaptive capacity may by now have become "implementation actions".

9. In what follows we respond to a number of specific questions raised in the call for evidence, which in some cases we group together.

Q. The extent to which the Adapting to Climate Change Programme will increase resilience by embedding adaptation and climate change risk assessment into the work of Government Departments

Q. Suitability of the processes and structures in and across Government Departments for identifying, mitigating and managing these risks and determining the future priorities of central Government's approach to adaptation (and the National Adaptation Programme)

10. 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" (DEFRA 2008). Research by the PEER project (Swart *et al* 2009) suggests a number of requirements for successful adaptation policy integration including, inter alia, high level political commitment, ability to deal with conflicts between sectoral objectives and clear allocation of responsibility for monitoring and learning. It is encouraging that the ACC Programme is overseen by a board with representatives (at senior civil service level) from most Departments to ensure it is driven across Whitehall. Although such co-ordinating mechanisms are in place, one obvious question is how DEFRA—whose objectives are the most exposed to climate risks but which has traditionally not been the strongest Whitehall Department—will fare in any inter-departmental disagreements.

11. Recent work by Tyndall Centre researchers sheds light on the challenges in the health sector. Following the 2003 heatwave, the Department of Health, in line with many European counterparts, invested significantly in heat wave planning to reduce mortality. Although there has been no equivalent heat wave in the UK since 2003, evidence from elsewhere in Europe suggests that such planning has been successful in reducing mortality. However, this planning has been limited to the specific risks from mortality from heat waves and research shows that vulnerabilities persist among susceptible populations.

12. The Department of Health-led effort on the Heat Wave Plan for England makes no explicit link to other efforts on climate change adaptation. The involvement of other agencies in the plan's implementation is limited to those who provide forecasts (Met Office) and deliver health services (NHS, Health Protection Agency). There is little evidence of other cross-departmental consultation and collaboration that could help engender more proactive and anticipatory adaptation strategies.

13. Evidence among independent-living elderly, aged 75 and above, in the UK suggests members of this group do not perceive themselves as at risk from extreme heat and only respond reactively once it is already hot (Abrahamson *et al* 2009). Their key social contacts, such as family members and friends, encourage elderly independence and do not generally warn against the risks of heat (Wolf *et al.* 2009). As a result, members of this group, vulnerable due to their age alone, may be at even greater risk. In light of these results it seems that anticipatory adaptation measures are necessary to prevent morbidity and mortality rather than strategies simply to help to cope with heat.

14. There is an important EU dimension to adaptation, which the ACC Programme document does well to recognise. Policies in significant sectors, including agriculture, water and conservation are shaped at EU level and affect the ability of UK stakeholders to adapt to climate change. Apart from committing to lead on providing UK input into the EU White Paper (*Adapting to climate change: Towards a European framework for action*, published in April), the ACC document promises that the Programme will work in tandem with other UK policy officials to help the EU embed adaptation in critical areas such as Common Agricultural Policy reform, the design of the next EU budget, as well as in environmental, health and other policies. Current EU budgetary negotiations offer an important opportunity to re-orient spending in favour of policies which reduce vulnerability to climate change which the UK should play its part in seizing.

15. Likewise, although the NAO briefing to EAC covers Government policy domestically, rather than action internationally to assist developing nations, policy-makers must be alert to impacts from outside the UK, especially if global temperatures are set to rise by considerably more than 2°C.

Q. The extent to which Government Departments have identified the risks from a changing climate that will stop them from meeting their objectives

16. The NAO's research, outlined in its report for the Committee, offers the most up-to-date evidence on the response to climate change risks by individual Government Departments (NAO 2009). As an observation based on this report, it seems slightly worrying that the Department of Health is a relatively low scorer in figure 10 (p 39), with the caveat that Departments' self-assessments may not be fully consistent or comparable.

17. More fundamentally, the focus of this question seems to be on whether Departments are taking into account risks to their own objectives. A more ambitious but also necessary task will be for Departments to examine the nature and current framing of those objectives themselves, and consider the extent to which they remain appropriate in new circumstances. Such reflection on fundamental sectoral objectives is envisaged in guidance on Strategic Environmental Assessment and Sustainability Appraisal, for example. In doing so, Departments will also need to take into account the extent to which their actions may compromise the attainment of other Departments' objectives.

18. Following this year's White Paper on adaptation, the European Commission currently envisages a process of "mainstreaming" adaptation concerns into EU sectoral policies. According to the Commission, this "should include an assessment of how policies affect Europe's vulnerability to climate change (vulnerability mapping), as well as how climate change might affect the success of policies" (European Commission 2009: 126).¹ We agree with the emphasis of the EU document that the process of 'mainstreaming' is not simply about identifying and responding to climate impacts within particular sectors, but also about investigating how particular sectoral policies may be contributing to vulnerability, either within their own areas of responsibility, or others. The Government will need to make sure that the mechanisms in place ensure that this broader view is being taken.

Q. How well the overall direction for work on adaptation has been set, the effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance), the allocation of powers and duties and how well issues like social justice are addressed in adaptation policies

19. The United Kingdom Climate Impacts Programme (UKCIP) and related efforts target relatively well-informed stakeholders in sensitive sectors. These stakeholders, from private and public sectors, have the resources and capacity to assess and deal with the pertinent risks. Other groups, however, such as elderly at risk from heat wave or residents at risk from coastal or inland flooding, are more difficult to reach. There is therefore a need for more localised planning for many such risks and inclusive and novel processes to engage vulnerable populations in discussions about risk and responsibility.

Q. The funding, support, training and other resources available, including at a local and regional level

20. The finding that "[s]ome [departments] noted that financial and resource pressures could act as barriers to dealing with climate change risks" (NAO 2009: 42) leads us to question whether sufficient funding is being granted.

Q. The monitoring and evaluation of work on adaptation, including thoughts on how progress on adaptation can be quantified and success measured

21. As the NAO's report observes, measuring progress on adaptation, particularly in outcome terms, is difficult: outcomes may not be seen and measurable for decades, 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' (eg utility companies) to report on how they have assessed and are addressing the risks of climate change.

22. While in principle adaptation can be evaluated according to generic principles including effectiveness, equity, efficiency and legitimacy, evaluations need to take particular care over possible externalities and spill-overs, both over time and over space. What appears to be a successful policy in the short-term may turn out to be less successful over a longer timescale. Similarly, whilst effective at one spatial scale, an adaptation may increase impacts on others outside the boundary of the policy. Since ultimate effectiveness of an action may depend on the future uncertain state of the world, we suggest that two key indicators of the effectiveness of an adaptation action should be robustness to uncertainty and ability to change in response to altered circumstances.

¹ The UK's approach to developing adaptation policy is broadly matched by that of the EU: both envisage the period up to 2011 being used to investigate the implications of adaptation for a range of sectoral activities. After 2012, there is expected to be a more concrete programme of action in place for both the EU and UK.

Q. *Should work on adaptation be embedded into existing sustainable development frameworks and, if so, how this might be achieved?*

23. The inventory developed by Tyndall researchers “shows that there exist a large number of drivers, and that these are not always directly related to climate change. Building adaptive capacity is often associated with indirect drivers such as sustainable development policies, regulations and corporate social responsibility and ISO standards. There also exist a large number that are directly driven by climate change related events, ie drought, flooding” (Tompkins *et al* 2009: 111). These multiple drivers for action should be built on to promote sustainable actions which make the UK economy and environment more resilient to future impacts.

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20 October 2009

Witnesses: Professor Neil Adger and Dr Tim Rayner, Tyndall Centre for Climate Change Research, University of East Anglia, gave evidence.

Q215 Chairman: Thank you for coming to talk to us today. I am sorry we are running rather behind time; you will have heard some of the previous evidence and we appreciate your contribution now. Could I start with a general question: is there a limit to the amount of climate change to which the UK will be able to adapt? Obviously the mitigation programmes are designed to contain temperature rises to two degrees centigrade, but we have heard from the Tyndall Centre before about the high risks that we may not be able to achieve that goal and if

we have a three or four degrees average rise in temperatures are we going to be able to adapt to that?

Professor Adger: I think the climate science community likes to talk in these global averages and it is easy for us to talk about two degrees versus three degrees versus four degrees but I guess that the impacts of climate change are not likely to be experienced in that sort of way; we will not wake up one day and it will be two degrees warmer. I think what is likely to happen, whether the global mean

19 January 2010 Professor Neil Adger and Dr Tim Rayner

average is two degrees or three degrees or four degrees, is that the incidents of extreme events of floods and heat waves in essence or the meteorology that gives us floods and heat waves is just going to change and it is going to become much more common and the sorts of issues associated with increased sea level rise and increased rates of erosion in the coast will, as it were, creep up on us and these will become more and more important policy issues. But there are absolute engineering limits to what we can do at three or four degrees of warming. There is certainly a risk of crossing some threshold whereby, for example, there would be significant deglaciation of Greenland, which would globally lead us to more than two metres of sea level rise. The Environment Agency's own modelling for the Thames 2100 project in effect says that we can cope, with present engineering, with another 50 centimetres of sea level rise with some additional add-on. Once we get beyond that we will not be able to maintain the one in 1000 flood risk defence that there is, for example, in Thames 2100 without some very, very significant engineering like a significant big barrage off Southend. But if we are talking two, or three metres or, with deglaciation of Antarctica, five to seven metres of sea level rise, clearly there are limits in the engineering of what we can actually do in these circumstances: the UK, the Netherlands and various other countries are facing that reality. So there are absolute limits in terms just of the physical environment and the risks that climate change directly imposes. I think there are also significant risks or proportions of the population where adaptation is going to be particularly difficult and it is going to seem like the end of the world if you have to up sticks and move your house from the coastal area that you are sitting in. That is all adaptation and we can cope with it nationally, but for individuals involved it is a pretty significant upheaval.

Q216 Chairman: You have referred to the one-in-1000-year events, setting aside the actual temperature increase but the greater frequency of extreme weather events is clearly one of the characteristics of climate change. Is it possible to start warning people—and we are seeing rainfall which is the most intense and concentrated for 100 years on record—of events which have previously been once in 1000 years, can we say that they might be once in 20 years under certain circumstances?

Professor Adger: You can certainly use that language of probability but I think if one-in-1000-year events become one-in-20-year events then we are in real trouble. The Thames Gateway at present is engineered to a one-in-1000-year risk and if those came once every 20 years there would be significant damage associated with those. But is your question whether or not that is useful information for the public?

Q217 Chairman: It was partly that, yes, and not just for the public but for developers and insurers and all sorts of other people.

Professor Adger: I think that the Environment Agency has done a good job. I think that this sort of language and this sort of information and the scenarios of future climate change—at least those associated up to two degrees of warming—are actually quite well understood and the UK Climate Impacts Programme and the Environment Agency, as far as we can tell, have actually done a good job in informing the key public and private sector stakeholders in the UK, the water utilities and the insurance and reinsurance industries, who I think understand these risks quite well.

Q218 Chairman: I think your answer might have been leading towards this, but are there some significant non-financial costs associated with adaptation?

Professor Adger: I think the main cost of adaptation or main regulator of that cost, and leverage on that cost, is going to come through the planning system. There are places and economic activities where development is going to be no longer viable, or less desirable, let us say, in flood plains and on coasts in particular. So not being able to do things has an economic cost, clearly, and we are just going to have to adjust to a new climate, to a new set of risks associated with a much more increased frequency of some of these types of extreme events. So I think that the costs may not be direct costs to the public purse of individual events. They will be opportunity costs, opportunities that we will have lost because flood plains will just be too risky to build on and coasts will have to be set back. But I think that there are a lot of other non-financial costs associated with climate change—things that people really care about, everything from what birds are in their back garden and the phenology of spring and all sorts of cultural icons about which people are concerned, not just in this country but globally. I think that those are going to become more important and more apparent and in some senses those are the sorts of things that do motivate people, whether they are bird watchers or gardeners, or whatever, and who think that actually climate change is real and we need to do something about it.

Q219 Chairman: Is the opportunity cost the area that is most difficult to deal with?

Professor Adger: Yes. I think certainly for public responsibility and for statutory agencies dealing with this. You have heard from the Environment Agency how far responsibility extends. What are the mechanisms that allow people to stay in coastal properties? How far does the public liability extend I think is a key question. We have talked a fair bit about coastal setback and issues there. I suspect that coastal defence is the sort of test case but there are going to be many other areas of potential public liability associated with other impacts of climate change, particularly in flood plains, but even to do with public health and other areas. The Environment Agency needs to get it right on the coast, including mechanisms for compensation, for liability, for consultation. This is the frontline at the

minute, and the lessons from that will also have to be learnt in flood plain management, public health and in other areas.

Q220 Colin Challen: Just pursuing these themes for a moment, for obvious reasons this morning we have talked a lot about flooding—that is the Environment Agency’s job—but in other respects adapting to climate change does mean having to address issues of energy and food security, for example, and Defra have recently been doing quite a bit of work on food security. Do you think that there are significant changes that need to be made to the way that we do things? For example, if we source food on a short-term basis—‘Just in Time’ is the market expression—should we start looking at different ways of strategically sourcing things like food and strengthening supply chains and so on.

Professor Adger: It is a very good question. I think that the significant unknown element of adapting to climate change is what is going to impact on the UK in terms of the impacts of climate change elsewhere in the world; not just whether or not Greenland melts and other melting that causes change to the climate here, but what happens, I should say, whenever food systems begin to become significantly disrupted and there is significant risk to food price hikes or interruptions in supply of major commodities and that sort of thing. Making food systems in particular more resilient probably does mean making them more local, certainly for the UK context or for the European Union context in that we are fairly temperate; there is quite a significant diversity of climates and therefore food availability locally within western Europe. But the 2008 food price hikes globally, although they were partly caused by an increase in biofuels, were significantly caused by major droughts in Australia, for example. What we have not really had up to now in the global food system is correlated, significant droughts in Australia with significant declines in Canada and North America in wheat supply. But if those happen at the same time—and the probability of those types of events occurring simultaneously in different parts of the world is likely to increase with changing climate—then those are significant disruptions to global food supply and that certainly gives impetus to Defra and others to actually look at localising supply of food and making food systems more resilient. But I would not go beyond the local western Europe.

Q221 Colin Challen: Would it also imply that our response should call for more planning and intervention in the markets—governments taking more control? Because at the present time we tend to just wait for the market to react to a problem and then find a solution. Should we not have a greater grip on these issues, particularly perhaps in the strength of our supply chains? You have mentioned local sourcing but a lot of our food—I think about a third—is imported and that is a significant amount if you are looking at controlling price hikes, for example.

Professor Adger: If we are talking just about food systems of course the Common Agricultural Policy in its present manifestation is a significant intervention in those markets. In western Europe these markets are in effect more regulated, more controlled than virtually anywhere else in the world. They are not controlled in terms of what individual farmers can grow or what they supply to market; but in terms of the overall food supply the Common Agricultural Policy does bring a fair degree of stability to farm incomes and to food supplies in western Europe. We are more than self-sufficient in commodities like sugar. A generation ago most of our sugar came from West Africa or the Caribbean as a result of sugar cane; but now we grow sugar beet and we are more than adequately supplied with sugar—in fact we export sugar. So there are mechanisms by which you can guarantee the actual supply of food. But I absolutely take your point that we are reliant on imports. I guess consumers expect year-round supplies of vegetables that they actually source from different climates or different parts of the world that come from the southern hemisphere—apples or fresh vegetables from the Tropics and that sort of thing. So these do need to be or can be made more resilient by localising them, even if localising means simply in western Europe.

Q222 Colin Challen: Do you think the Government is showing sufficient leadership on adaptation and—this refers back to my earlier question about intervention—is it simply leadership by example so that the public sector can get the message or does it mean something rather more substantial than that?

Professor Adger: At the Tyndall Centre we worked with UK Climate Impacts Programme and Defra a few years ago and tried to identify all the adaptation activities which were going on in the UK and we came up with a number. We developed a database; UKCIP use it and you can look at it. At that time a few years ago we had 350 documented examples of adaptation and planning going on in the UK. This is just numbers, some are doing it on a very large scale, like the Environment Agency’s Thames Estuary 2100 Plan through to documented examples of individual house builders or settlements being amended because of climate risk and the like. Defra put the question to us, “Is 350 a huge number or is that a really tiny number?” and I think that is still an open question, “Are these 350 shining cases of good practice and within a decade when the risks are known those will turn into 350,000 examples or, in fact, are we doing things just about right in terms of experimentation and the like?”. What we found from those 350 examples was that at least 90% of them were assisted by the public sector or directly in the public sector because of statutory responsibilities, et cetera. In that sense government is taking the lead in the UK and rightly so because of the nature of the risk in the long-term planning. There is also some evidence of the relative response of the UK compared with other countries.

Dr Rayner: There is evidence that the UK—I think this is echoed in other evidence from other witnesses—is a leading EU member state when it

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comes to promoting adaptation. If you look, for example, at the study by the PEER network, the Partnership for European Environmental Research, it is rather complimentary about the UK's approach. They suggest that leadership and political will is, indeed, an important factor in the success of these strategies which are being developed throughout the European Union. To some extent the legislation and the putting in place of the new machinery of government which you are looking into is an expression of leadership and political will by the UK. Just to echo what some of your other witnesses are saying, the framework is encouraging on paper but obviously it is early days and we will need to see how it will develop in practice, particularly when there are potential conflicts which emerge in priorities between departments perhaps, which I imagine you were asking about earlier.

Q223 Colin Challen: Are there any aspects of adaptation which if we do not address them now, we then miss out completely and find ourselves doing too little too late?

Professor Adger: The planning system clearly has some specific issues to deal with and a lot of the change, particularly associated with flood risk or with increased coastal erosion, in effect those impacts are irreversible and, therefore, we need to plan, set aside and set back. I guess one of the other dimensions of this problem which you have already alluded to is the international dimension, what is going to happen to climate change around the world and how that is going to affect the UK. For example, UK private investment abroad is quite significant. The UK finance sector and the insurance industry have significant liabilities and assets all around the world in places that may experience much greater impacts of climate change than necessarily we do. Therefore, I think there are some significant unknowns within this whole climate change impact picture on what the transmission mechanisms are for impacts abroad to affect us. We have talked about price hikes in food, but if there are significant impacts on real estate all up the East Coast of the United States or significant impacts of flooding in central and western Europe, significant impacts on the Netherlands, all those are going to affect the UK in one way or another with our trade effects, with significant investments abroad. Of course, the movement of people around the world associated with climate change is another unknown area. Clearly people are going to be moving and they have always moved around the world and there is a trend towards urbanisation in those countries that are not already completely urbanised, but I think there are many different dimensions to the impacts of climate change which both the private sector and the public sector perhaps have not quite thought through at present. That all sounds both very alarmist and very broad-brush, but I am sure your Committee, from the terms of the inquiry, recognises this, that adaptation is so all encompassing and amorphous that it gets to the heart of what sustainable development is, what progress is and where the UK should be going.

Q224 Joan Walley: Can I follow that up because we have seen a lot recently in respect of the financial crash and the urgent search for some kind of regulation internationally that will address those issues. What is the mechanism for dealing with those alerts that you just referred to about things which could go drastically wrong in terms of the overseas investment? Is there a mechanism which you think is there currently through the UN, through post-Copenhagen? What is the procedure for somehow quantifying and even understanding what needs to be addressed?

Professor Adger: On those specific points, the UN process relies on the Intergovernmental Panel on Climate Change to provide the best science and that will be reporting again in its fifth assessment in 2013.

Q225 Joan Walley: That is to do with the science, I am talking about the adaptation implications of what comes out in the science.

Professor Adger: Increasingly the IPCC is trying to focus on the need for adaptation, so they are producing a special report at the moment called *Special Report on Managing the Risks of Extreme Events and Disasters* to specifically look at how climate change is going to manifest in a changing instance and intensity of extremes around the world and what adaptation processes and policies are being put together and actioned. They are also addressing explicitly the need for international action and international response, both to extreme events and disasters, such as cyclones and hurricanes, the sorts of activities which took place in Burma, in countries that cannot cope and are overwhelmed by large-scale events, but also to co-ordinate, looking at what is known about the co-ordination of information internationally, not just the climate risks themselves but how adaptation occurs. In Copenhagen there is the idea of international solidarity, that the global community should be providing \$100 billion per year by 2030—it is in the Copenhagen Accord—for adaptation in the developing world, recognising the interdependence of food supplies and security and all sorts of things.³

Q226 Dr Turner: You have been quite complimentary about the British Government in its policy response to climate change and the need for adaptation with the Climate Change Act and establishing the cross-departmental committee on adapting to climate change. Are these responses sufficient to manage the available risks or do you think there are significant gaps possibly which the UK needs to address in its policy framework?

Professor Adger: Again, the climate change and adaptation to those impacts is so widespread and amorphous and those risks manifest themselves in different areas of government in public policy rather differently. Let us take the Department of Health, for example. There are risks associated with increased mobility of populations which means if you have malaria-bearing mosquitoes, for example, that come into Heathrow and survive for slightly longer than

³ Note from witness: The target date is 2020, not 2030.

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there is a risk of the instance of malaria around major transport centres. Those are small risks and they only pervade to one government department. The Department of Health also has to deal with issues like heat wave planning. Heat waves are going to become more common. The 2003 heat wave clearly had significant impacts on excess mortality, particularly in London. The Department of Health, along with other Departments of Health across western Europe, have reacted quite significantly to the 2003 heat wave and implemented a very extensive heat wave planning system. It has not really been tested in any significant sense in the UK since 2003 since we have had two or three wet summers, but the similar systems which have been tested in similar heat waves in Italy and France in the years subsequent to 2003 have been found to be quite effective. I think each department is facing different types of risks. There is a limit to the integration and to the way departments can learn from each other because they have specific responsibilities. Would you agree, Tim?

Dr Rayner: Yes, I think so, with the proviso that it is a fast-moving area and, as other witnesses have said, it will be interesting to see what exactly the content of the various departmental action plans turns out to be. Perhaps later on this year when the departmental plans have been published is the time to consider what gaps there might be and to see how the mechanisms for Defra's programme board to review these plans work.

Professor Adger: One area I assume Defra is leading on or that across departments need to be aware of is the risk of some of the higher scenarios of climate change and some of the worst-case risks over a longer-term period and the period possibly after the next two or three decades. If we are heading for three or four degrees of global mean warming, the impacts associated with those move the ball into a rather different arena and the sorts of impacts and adaptations that departments are going to have to deal with are going to change rather radically. Even with two degrees of warming, the return period for the 2003 heat wave, which was a one in 500-year event in western Europe, could come down to one in ten or by 2100 down to a one in two, so those could be the sorts of summers we face. Dealing with heat in particular or events which come and then go and do not have a long-term impact, like floods, for example, the evidence is we can adapt to that, acclimatise to that and take steps to adapt to that quite quickly. With the increasing incidence of that type of risk even at higher levels of global mean warming, there are some things we can adapt to quite well, but there are others which are going to be much more difficult to deal with, such as two or three or four metres of sea level rise.

Q227 Dr Turner: Can you point to any specific examples of policy frameworks which other countries are using that we can learn from?

Professor Adger: In terms of the provision of public information, other countries do look to the UK, to the UK Climate Impacts Programme and to the UKCIP scenarios and the like as best practice. All

major industrialised countries have somewhat underestimated the risks associated with climate change, and the large continental countries like Australia and the United States have assumed, "Oh well, the risks are going to be different and we are going to be able to adapt within the jurisdiction of the country because it is going to be patchy across different parts of the country" and the like. I think Australia, for example, have had a significant wake-up call over the past two or three years with extreme events, with ongoing droughts, significant impacts on their agriculture, and they are only now beginning to look at significant adaptation policy frameworks and, following the UK, have set up a Department of Climate Change and the like to try and integrate these risks. I know you are hearing positive stories, but I think the UK in some senses has been ahead of the game in thinking through these risks and thinking more broadly in this area.

Dr Turner: I must apologise, but we are not used to getting such positive responses from witnesses.

Q228 Mr Caton: Some earlier witnesses in this inquiry have argued that the Government has not done enough to define what it means by adaptation. In your view, how well has the Government defined and communicated what it means by adaptation?

Professor Adger: I think if you asked the person in the street, they would not know what adaptation to climate change really is or there is a conflation of adaptation to climate change with de-carbonising the economy and all those sorts of things. I am not sure that adaptation is ever going to be high on the public agenda. I think making developments and decisions locally within district and county councils and making development sustainable is the way forward here. There are lots of things we could do to adapt to climate change which themselves would not necessarily be sustainable and I think the policy signals and planning guidance needs to address those. If we are going to have significantly more heat than the easiest thing to do is for individual households to install air conditioning, but clearly that is an energy-intensive adaptation to that particular risk. Within every sector, from house building and public buildings, we need to begin to think through how we can live with a different type of climate now and adapt to it through the principles of sustainability.

Q229 Mr Caton: That is a useful answer. In fact, it was somebody in the local authority sector who identified this lack of definition. The Greater London Authority, for instance, suggested that government could explain adaptation to local authorities by setting down a list of statutory activities and funding. Do you think that would be useful?

Professor Adger: I am not sure what that list of activities might be that the GLA was referring to. Although it sounds as if we are advocating not being integrated, dealing with these very specific risks because of the geographical spread of the nature and the different types of risks it is only going to apply to particular councils. Coastal councils are going to

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have to deal very explicitly with these coastal risks; it is only really the major urban centres that are going to deal extensively with heat wave risk. I am not sure how you could define what adaptation is and a set of activities that you could pass legislation for. In fact, the European Union has struggled with exactly this. They had an Adaptation White Paper process and they had great difficulty in pinning down what adaptation was and what should be in and what should be out of this process simply because adapting to a change in climate, is it to maintain the status quo or is it to make development more sustainable or to minimise risk. The objectives of adaptation, what it is we are actually trying to do and how we are trying to move forward, are not clear. I think that was why the European Union had difficulty in defining what adaptation is. You can only get so far in having adaptation policy or an adaptation set of directives.

Q230 Mr Caton: The fact that a major local authority—and, in fact, the local government information unit made a similar point—feels there is this lack of definition is surely quite strong evidence that they are worried that they are being hampered from taking every action they possibly could to deal with climate change.

Professor Adger: Perhaps that level of government is more concerned about their liability. That is one of the issues—and you have already discussed this clearly with the Environment Agency witnesses—where liability stops and where it pertains to. I think this is one of the key issues clearly which is, knowing the risks, what is the responsibility of the individual or local government or central government in acting on the basis of that risk and is there a no fault liability associated with setting back coastal properties and the like. I suspect that is why local authorities are particularly keen on having a very clear set of responsibilities and definitions to identify what their liabilities might be.

Q231 Joan Walley: In the evidence you have given to us you refer to phasing, you get some analysis and then it is a question of what the delivery plan is as a result of the analysis. I am really interested as to whether or not you think the Government has got the right balance between analysing adaptation and building adaptive capacity and taking action. Is the balance right because is there not a fear that we could be getting towards five years' time, 2015, and we are still analysing? How do we get the right balance so that we get the action we need linked to the evidence and the analysis?

Professor Adger: In the Tyndall Centre we have a very strong view that now is the time for action and, in fact, not wanting to put ourselves out of a job, I think we already know enough about the general

direction of the impacts of climate change and the scale of them certainly over the next two or three decades. My colleagues did an analysis going back and looking at the UK's future projected scenarios of climate change for the UK. The process started in 1990, so they have projected from 1990 onwards to 2000–2010. They re-analysed those and found that the UKCIP scenarios were very accurate in predicting the sorts of weather that we might have. They certainly argued that there is not much of an information deficit. Certainly for major infrastructure and the major risks we know the direction of change and the general magnitude of some of those changes, at least over the next two or three decades. I do not think there is much of an information deficit and that suggests that now is the time for action on adaptation to climate change.

Q232 Joan Walley: Do you think the Government, with all the different committees and so on that it has set up and the policy which it has, has got that balance right and is now poised to put into action the outcomes that your and others' analysis is leading to?

Professor Adger: Yes. In saying that we have enough information to act in terms of the general direction does not, of course, mean there are not very specific types of risks which are somewhat still unknown. The key is defining strategies and having policies that deal with that range of uncertainty going into the future. If we take large-scale infrastructure type projects, such as the potential for the Thames Gateway, the Thames Estuary 2100, we could plan for three or four metres of sea level rise. It took 30 years effectively to design and build the Thames Barrier, it could take us 30 years or longer if we decided to build an outer barrage on the Thames Estuary, but we need a process by which as new information comes onboard and the risk of significant sea level rise unfolds—there are observations from Greenland as to how sea level rise is going to occur, how the modelling becomes better and we become more certain—then we need decision processes by which we can make decisions on those large-scale infrastructures. I think it is the same in other areas of planning around flood risk, et cetera. We will never be effectively adapted to climate change. Because we have perturbed it, it is going to change over the next century or two. It is not going to be, here is the present climate and we are going to wake up one day with two degrees of warming or even three or four degrees of warming and the associated impacts, those risks are going to change in different areas of public policy and it is going to wax and wane in the attention of different government departments over time. There will be some randomness in that because it is partly to do with the return period of extreme events and randomness. Although the heat wave of 2003 was a one in 500-year event, that does not mean to say we could not have two or three of those in the next decade and then suddenly that issue of planning for heat would be much greater.

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Q233 Joan Walley: In respect of those different government departments that will be looking to bring in different adaptive policies, is there more that government could be doing given that ours is a cross-departmental Select Committee? What are the drivers that will ensure the necessary actions on the ground are in place, for example social responsibility, any directions given to regeneration, to the extent to which regeneration initiatives and investment future plans would have regard to the need for adaptation? On the whole issue about regulation, we are very much into a phase of light-touch regulation. The CBI is calling for much less regulation, yet surely regulation could be a key driver because that could give the certainty which would be needed when investment is being made.

Professor Adger: In our 350 examples that we documented, in many of the examples we looked at regulation was the key driving force. Individuals, even up to large-scale companies in the private sector, were not necessarily directly themselves assessing climate risks associated with their business or with their locality or operation, they were reacting to changes in regulation. Clearly it is through planning policy guidelines and through the regulatory system that the major adaptation steering hundreds of thousands of individual decisions is going to come.

Q234 Joan Walley: Is there not an inconsistency there because, correct me if I am wrong, is not the government department BIS looking at lighter regulation and less regulation? How does that square with the need to have certainty about where companies invest?

Professor Adger: In terms of localities and places, I think lighter regulation does not necessarily mean that regulation is not effective in identifying where those risks are and the sorts of activities where that might be. When we looked at flood risk a few years ago and looked at the operation of the house-building sector to changing flood risk, even within a sector they were reacting to a regulation which effectively comes from the planning system, but you have a diversity of responses even within an individual sector. We looked at some large-scale providers of social housing, large-scale house builders and some smaller-scale companies and we found that when a flood risk area is designated some companies will retreat from that and say, "We cannot engineer in that area", so the reaction to that regulation would be to reduce their investments or not take on projects in those areas. Whereas other companies said, "Actually, we have the engineering competence, we are going to go into that floodplain". Land prices decline and so there is an opportunity to make money. If we have the engineering competence even in the Blyth Estuary to build houses that are flood-proof, then there are still opportunities to go into that. Within a sector you have a very diverse set of responses even to a regulatory framework and information. That can be as light-touch or as heavy-touch, but the

information needs to be out there as to where those risks are and we need to observe consistent, as you say, clear guidance, that this is led by the Environment Agency, this is not a good idea to be planning or building here, these are the sorts of risks in other areas of public policy. I absolutely share your concern that light-touch regulation means no regulation. The whole set of information that the UK has done a very good job on getting together on what these risks are needs to be brought clearly into this regulatory framework.

Q235 Dr Turner: You have already alluded to the potential effects on the UK of climate change in other countries. Obviously agricultural products are a good example. Should we be doing more to anticipate and understand these potential impacts, perhaps changing our own pattern of agriculture in response to, for instance, a world shortage of grain or whatever and so on?

Professor Adger: The Adaptation Sub-Committee set up under the Climate Change Act is specifically looking at this, it is undertaking a national climate change risk assessment which is ongoing at the moment. I think part of that is looking at how the weather is going to change in the UK, but the part which is both more unknown that also we have not really got a handle on is specifically this issue of how impacts on other parts of the world are directly going to affect here. The major effect of climate change in UK agriculture may be to change the relative prices and relative availability of major foodstuffs and that is what farmers here and the farming sector are going to have to react to and adapt to. We are going to have to promote and provide guidance on how to go through that transition to ensure food security.

Q236 Dr Turner: Are you satisfied that sufficient work is being done on that?

Professor Adger: I think it is a very uncertain area. It is something that UN bodies, particularly through the Intergovernmental Panel on Climate Change, have highlighted as one of the key areas, but there are others. The two others I have highlighted are the impact of climate change on UK overseas investments and the impact on the finance sector, particularly through the insurance sector, is quite significant but also the potential for movement of people around the world and whether or not that is going to have some impact on the desirability of people in the UK to go and retire in Spain if Spain becomes an uncomfortable climate to live in. It is going to change demographic patterns like that as much as people wanting to migrate to the UK.

Q237 Joan Walley: You talked a little while back about the fact that the average man in the street probably would not have all that much information to hand about adaptation and what is needed, but I wonder, given the need to engage with people and also vulnerable people, not just those who are well informed, what actions there should be, how we can have that community engagement process and what lessons could be learned from abroad on that as well.

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Professor Adger: I said that the average person in the street may not have a good grasp on what adaptation might be and the imperativeness of it, but I think the average person in the street in the UK has got a good grasp that the weather is changing. Certainly in my own personal networks and experience—my father being a farmer and the rest of it—people who observe this quite closely know the weather is changing, gardeners realise this, and people are concerned, both in this country and internationally, about their local environment and about things they care about. Those issues can become iconic in demonstrating to people what the impacts of climate change might be and what the adaptations are that we might require. That will become a more significant motivator of the justification for a low-carbon economy and move towards decarbonisation. If people realised that the Giant’s Causeway in County Antrim is going to be under water and that is not only a local tourist issue but it is an icon of the whole of the North of Ireland, those are the sorts of things which hit home. If it is the Fens, the Broads, if it is the non-arrival of spring, coming two weeks earlier, not having frosts in the winter and never seeing a white Christmas again, those are the sorts of things we all have a good grasp on and begin to see what climate change is going to do to the UK in material and iconic and representational terms.

Q238 Joan Walley: Am I right in thinking that your advice to government is that more localised planning and novel ways of engaging, particularly with vulnerable people, is needed to be able to deal with the effects of climate change that come up? Is government as well prepared as it could be to do that or what more should it be doing?

Professor Adger: This is a very difficult area. We undertook some research with the London School of Hygiene and Tropical Medicine and various other health professionals at University College London on the heatwave plan and we interviewed the populations who were vulnerable to heat wave, who are primarily the elderly in Norwich and London. These are the people that the heatwave plan through the GP system and all the rest of it tries to target and says, “These people with underlying health problems are going to be vulnerable to these sorts of impacts”. Basically what we found was there are very persistent and very hard to reach populations who are always going to be vulnerable, in this case for two reasons: one of which is they have very low what is known in the trade as ‘self-efficacy’, people who were frail and elderly did not really have the ability to do things, thought they did not have the ability to do things even though the actions they needed to take to adjust to these risks were quite simple. At the other end of the spectrum—the age range in our population was 75–94—people were saying to us, “Oh well, elderly people are vulnerable to heat wave risks, but luckily I am not vulnerable because I am not old”. These were people in their 90s saying this to us. Their whole identity was about their independence, they were living alone and all the rest of it, so they were denying the risk and saying, “Well,

it is nothing to do with me because this is not my risk”. Those people from a public health perspective are at risk, but there are reasons both in this case because of marginalisation and economic reasons and for reasons of identity, et cetera, where people react to these risks rather differently. There are always going to be difficult to reach populations and the heatwave plan from the Department of Health is very, very good in setting out what GPs should do and encouraging people to look in on their neighbour, but there are always going to be these persistent pockets of vulnerability and I think that is the same if you look across the country as a whole.

Q239 Joan Walley: I am an honorary Vice-president of the Chartered Institute of Environmental Health. Do you believe professional organisations like that have a role to play in this mix as well?

Professor Adger: Absolutely. Identifying where these particular vulnerabilities are—sometimes it is easier to see those geographically when we are talking about properties on the coast or inner-city floodplains, places that are susceptible to flooding, to the 2007 summer floods in Hull, Oxford and Gloucestershire and the like, than it is perhaps to see which populations are vulnerable to heat wave risk. There is an awful lot of work to be done to identify those specific areas. If I gave the impression that we know the climatology of where the general risks are, that is true, but down to the specifics of where the vulnerable populations are is a much more critical area.

Q240 Chairman: Looking at another group of vulnerable people, people who might suffer from coastal erosion, a fairly easily geographically defined group, what should the Government do to help them if they are going to suffer or have suffered a major loss?

Professor Adger: I have already alluded to this, but I think this is probably the most difficult question that government really needs to tackle at the moment, which is where is public liability for the impacts of climate change which are clearly exposed on populations. It is an inequality associated with historic, present and probably future emissions. We are all blithely polluting the atmosphere and causing harm to others, but where does the liability for that stop? Let me say one thing. I think the environmental sciences in the climate area over the next 20 years or so are going to be able to attribute the weather patterns that we see to climate change and are going to be able to say, “Oh well, here is an event for the 2003 heat wave or the 2007 summer floods, well let us say that would not have occurred or there is a 50% probability that would not have occurred without human induced climate change”, and therefore you can immediately see that human action is causing that impact on individuals. If that is the case then it is the polluters who are liable for that, but if the polluters are everyone in the world for the last 150 years or the industrialised world, then where does the liability for that actually occur? In societies where there is much more litigation, the US, these cases are already starting to come through.

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Then there have to be processes by which that liability is bounded in some ways so that if you have a property on the coast and you bought it within the last five years and you know the risks then do you have a case for compensation, even with the fact that the coastal erosion you are facing is human induced and caused by prior polluters that we all have sanctioned in some way. I think the coastal one is at the forefront of this issue and if we do not get it right there then those public liability issues are going to cascade and be in other areas where 20 or 30 years from now we will know that the weather we are facing, the events, the excess mortality associated with heat waves, is down to human-induced climate change and that will be much more widely accepted and much more defensible in court in some senses or through the legal systems. We have got to get it right for coasts. Defra and the Environment Agency are clearly struggling with this at the moment from an ethical perspective. There is an onus on central government to directly deal with these risks where people were unaware of them. I will not say any more than that, but clearly there is an ethical onus on us given that we have to pay for the pollution that we have, in fact, caused. There is also the need for very clear guidance through the planning system at the moment so that liability does not stretch back for 100 years or whatever and that when the impacts of climate change are known and understood, then in a

way that puts a limit on that actual liability. That is another good reason for the Government being very clear through the Climate Change Act on what climate change is and the need for action.

Q241 Joan Walley: In terms of what you have just said about planning, can I ask whether or not you feel the new planning legislation sufficiently incorporates what you just said about future liabilities?

Professor Adger: I do not know in detail, but I know that Defra are still trying to work out or be very explicit and clear about what this liability should be. As I understand it at the moment I do not think the planning system is clear about what that liability is. I have to say that some local coastal communities and even coastal authorities obviously do not want that liability, but they do not see themselves to have significant competence. Some coastal local authorities we have spoken to would like to see that going up a level back to central government to be very strategic in this area, not only because of the issues we talked about, but also what one local authority does in its coast tends to affect the others up and down the coast. There are impacts being transferred up and down the coast with sediment budgets and the like, so what happens in Suffolk actually affects Norfolk.

Chairman: Thank you very much indeed for coming in. This has been a very useful session.

Tuesday 26 January 2010

Members present

Mr Tim Yeo, in the Chair

Colin Challen
Mr David Chaytor
Martin Horwood

Mark Lazarowicz
Jo Swinson

**Memorandum submitted by the Adaptation Sub-Committee of the Committee on
Climate Change**

SUMMARY

- The Adaptation Sub-Committee (ASC) welcomes the Government's efforts to prepare the UK for climate change, as exemplified by the Climate Change Act.
- The policy framework for adaptation is logical. Its objective should be to embed adaptation in all climate-sensitive aspects of decision making in the public and private sectors. This will take time and learning will continue for many more years.
- The Committee has some concerns, for example the exclusion of electronic communications companies from the Adaptation Reporting Power. And many Local Authorities score poorly against the adaptation indicator—NI188—implying a lack of adaptive capacity.
- The success of the framework will depend on commitment from bodies other than Defra, such as other Government departments, Local Authorities, businesses, especially parts of the national critical infrastructure, and individuals.

ABOUT THE ASC

1. Established under the Climate Change Act 2008 the Adaptation Sub-Committee (ASC) is required to: provide independent advice to Government on the preparation of the UK's Climate Change Risk Assessment (CCRA); assess progress towards implementing the Government's National Adaptation Programme, due to be laid before Parliament in 2012; and respond to requests from national authorities on matters relating to adaptation. Committee members were appointed by Defra between May and October 2009. The Committee is supported by a secretariat of six analysts.

2. Since its appointment last year the ASC has published a work programme outlining its key objectives for the future. These are:

- (i) to scrutinise the development of the first CCRA by providing ongoing, independent advice;
- (ii) to assess the preparedness of the UK to meet climate change risks and opportunities; and
- (iii) to promote effective adaptation actions by society as a whole.

The Committee has already delivered two rounds of substantive advice to the Secretary of State on the development of the CCRA method. It has responded to the BIS consultation on proposed new powers for Ofcom and has advised on guidance for the implementation of the Secretary of State's new Adaptation Reporting Power. All of these documents are publicly available on the ASC website (<http://www.theccc.org.uk/reports/asc-reports>). Members of the Committee and secretariat have developed links with a range of stakeholders including Defra, the Environment Agency, UKCIP, Natural England, the Forestry Commission, the Tyndall Centre and others.

3. The ASC welcomes this enquiry into the preparedness of the UK for the inevitable effects of climate change. Even if the world achieves rapid reductions in greenhouse gas emissions, then there is at best an evens chance of keeping global average temperatures below 2°C. Many aspects of society today assume an unchanged climate, and for this reason it is vital that Government creates an effective framework for promoting and enabling adaptive action.

How well does the overall statutory framework set out in the Climate Change Act fit together?

4. The adaptation framework as set out in the Climate Change Act is among the most comprehensive in the world. That said, the process of developing policies which take into account climate change is still very much in its infancy. The Adapting to Climate Change team, based in Defra, have championed the adaptation agenda, though the commitment of others is less clear at this stage. Successful adaptation will require sectors to help identify and take ownership of their own climate change risks. In particular, businesses, local authorities and government departments responsible for long-lived critical infrastructure have an important role to play.

5. The objective of the statutory framework should be to ensure that UK society adapts effectively to climate change. Adaptation should become progressively embedded in all climate-sensitive aspects of decision making in the public and private sectors. In other words, adaptation is not regarded as a separate

process but is integrated within broader planning and risk management activities. This will take time. Learning will continue for many more years as the framework is deployed, monitored and assessed. It may also mean resolving conflicts in organisational objectives, for example between short-term cost reduction and long-term risk reduction.

6. The Committee is at an early stage in its work, but its first impression is that the coverage of the framework is logical and reasonably comprehensive, although there are areas of concern:

- (i) Departments are required to produce Departmental Adaptation Plans (DAPs) setting out their preparedness for climate change risks to their policies, capabilities and estates. However the Committee notes that the time to produce these plans is short and that inevitably the quality will be variable.
- (ii) Parts of the critical national infrastructure will be covered by the reporting powers framework, which will require organisations to set out their preparedness for climate change. However the Committee believes that this power should be cast more widely. For instance, electronic communications are now vital for society's ability to monitor and respond to extreme events, yet the reporting power does not cover these companies.
- (iii) Local Authorities in England can choose to report against indicator NI188 which measures their progress on assessing and managing climate risks and opportunities. Currently we understand that around a third of all authorities choose to report against this indicator under the new performance framework for local authorities and local authority partnerships. Many local authorities score poorly against this indicator, implying a lack of adaptive capacity.

The Committee believes that it will be important to assess the fitness for purpose of these initiatives before the development of the Government's first National Adaptation Programme, for example, whether the processes introduced actually lead to a change in behaviour of organisations. To this end, the Committee will look at a strategically selected sample of DAPs during 2010 and it has agreed with Defra that it will look at summaries of the responses to the reporting power.

What are the challenges to implementing the framework effectively?

7. There are several challenges, which affect the private and public sectors, to making the right adaptation decisions.

- (i) The timescales over which climate change occurs are long and the extent of climate change is uncertain. Climate is inherently variable and projections of climate are more uncertain when looking at local scales rather than the global scale. It is very difficult to predict changes in the incidence of extreme events, eg storms. The impacts of climate change also interact with wider changes, such as socio-economic trends and changes to natural ecosystems.
- (ii) Efficient decision making requires the use of more complex techniques than those used in standard appraisal processes. This has been recently reflected in the supplementary guidance to the Green Book produced by Defra, for example the emphasis on real options techniques. In effect, decision makers need to adopt strategies which are robust to a wide range of climate outcomes. This is particularly true for owners of very long-lived assets.
- (iii) There may be institutional difficulties to ensuring that organisations are sufficiently committed to assessing their preparedness to climate change, given the long term and highly uncertain nature of the risks. Whilst legislation and regulation can help, it may not deliver an increase in preparedness if compliance becomes a box-ticking exercise without any associated change in behaviour. The drivers of behavioural change at institutional and individual levels are not well understood. It is necessary therefore for Government to assess whether its adaptation messages are taken up by senior decision makers.
- (iv) There is also no commonly agreed metric for measuring success (unlike mitigation where success can be quantified by the mass of carbon-equivalent emissions avoided) since it is very difficult to measure, say, the number of floods avoided. It is important to recognise that climate variability means that even well adapted societies will suffer some disruption from climate change.
- (v) Some of the most significant impacts on the UK may arise from impacts in other countries which then have secondary impacts on the UK. For example, changes in global agricultural production caused by climate change will have an impact on the UK mediated through global markets.

8. The Government has already launched the UKCP09 projections to communicate the uncertainties associated with projecting future climate. UKCIP has followed this up with a range of events to encourage organisations to use the projections correctly. The CCRA will also set out the main risks and opportunities that climate change will bring to the UK and this should take account of the uncertainties caused by wider biophysical, social and economic trends. It will be important to ensure that the use of external consultants to deliver the first CCRA does not prevent the development of institutional memory, within Defra and others, which would allow the knowledge gained to be effectively maintained and distributed to end users beyond project completion.

9. Despite the challenges, broad guidelines can be adopted to identify appropriate adaptive measures. Flexible plans should be developed, which can be adjusted in the light of new information and do not reduce options for the future. Resilient measures, which perform well under a range of possible futures, are to be encouraged. “No regrets” options, coming at little or no extra cost but potentially having ancillary benefits (eg reduced running costs, increased biodiversity) can be employed.

10. Ensuring current and future climate risks are mainstreamed into the legislative framework is necessary so that critical services do not become maladapted in the future. Priority should be given to addressing decisions made in the near future which will have implications over long time periods (eg location and design of housing, energy infrastructure, transport links and forest growth). Land use decisions should also recognise the full range of services provided by land, for example peat bogs can reduce run off and the extent of flooding and act as carbon stores. Finally, there may be issues of whether and how the costs of climate change should be shared across society, for example in the case of properties abandoned to sea level rise.

14 January 2010

Witnesses: **Professor Lord John Krebs**, a Member of the House of Lords, Chairman of the Adaptation Sub-Committee of the Committee on Climate Change and **Mr Neil Golborne**, Team Leader Adaptation, Committee on Climate Change, gave evidence.

Q242 Chairman: Good afternoon and a warm welcome to the Committee. It is the first time we have been able to talk to you, certainly in this capacity. As you may know, we have a lot of interest in this particular inquiry and some people feel the amount of attention adaptation has received has not been commensurate with the amount of attention mitigation seems to get, so you are all the more welcome for that reason. I know that the Sub-Committee has a role which is set out in the Climate Change Act and has certain statutory functions. I wonder whether to begin with you would just like to set out what you see as the role of the Adaptation Sub-Committee.

Professor Lord Krebs: Thank you very much Chairman and thank you for inviting me to give evidence to you. I should also like to introduce Neil Golborne on my right who is the Team Leader of the Secretariat. What do I see as the role of the ASC? We describe ourselves as having three roles. Number one is to scrutinise the Climate Change Risk Assessment which has been commissioned by Defra and to comment on it. Number two is to assess the degree of preparedness of the UK as a whole for adaptation to climate change which will feed into the Secretary of State’s development of an adaptation programme. Number three is to promote the adaptation issue more widely amongst relevant stakeholders. I agree very much with what you said in your comments a few moments ago that adaptation has been somewhat the Cinderella of climate change, although increasingly as we move forward and realise the actuality of what is going to happen, our attention to adaptation will have to increase.

Q243 Chairman: Do you think that your Sub-Committee is in a position to do what it needs to do? You mentioned the three things you see as its principal role. Are you equipped to do so? Is it going to work well?

Professor Lord Krebs: It is very early days so I do not want to be over-confident but another way of looking at it is: what are the barriers which could prevent us doing what we are setting out to do? One

barrier would be the failure of the relevant participants, stakeholders in the public and private sector, to engage with the adaptation agenda. It is very important that people buy into it whether through the requirements of the Act, the departmental action plans or the Reporting Powers for various statutory undertakers and bodies with public roles. That is one element which could inhibit us but we cannot tell yet whether stakeholders of that kind will engage. The second would be if the risk assessment were in some way inadequate to enable us to provide good advice to government and we are playing a role where we are scrutinising the risk assessment as it goes along to try to ensure that in our opinion it is steered in the right direction and delivers what it is supposed to say on the tin. The third thing that could be a barrier to us would be lack of resources, if our budget were severely cut and we did not have enough resources to continue with the work we have set out to do. In terms of the expertise I have on my Committee and the support I have from Neil and his team, we are very well placed.

Q244 Chairman: Just on the budgetary point, we would be hopeful that the whole Climate Change Committee, including your part of it, was going to be protected; I am not sure there is going to be a period when there are going to be huge increases in resources. You have a statutory role in commenting on the progress of the National Adaptation Programme. Would you see a role in actually helping to design the programme and influencing what goes into it?

Professor Lord Krebs: That is not explicitly in the Act; our role is to comment on the programme and on progress towards implementing it. However, in the view of my Committee, the work we do on commenting on the Climate Change Risk Assessment and on the assessment of the preparedness of the UK will implicitly, if not explicitly, form an input into the Secretary of State’s adaptation programme. The facts as they play out will be that we will have an input, even if it is not explicitly laid out in the Act that that is one of our roles; we will definitely have influence.

Q245 Mr Chaytor: In terms of the organisational structure that the Act set in place for preparation of adaptation, are you confident that that structure is sufficiently streamlined or are there overlaps and duplications which are likely to cause problems?

Professor Lord Krebs: I would say that it is probably a bit too early to tell. As people have become aware of adaptation, there are clearly several players in the field, of which we are one. There is the UKCIP¹ programme based at Oxford. There are various regulatory bodies such as the Environment Agency and Natural England which are playing a role and then of course there are bodies like central government departments, regional authorities and local authorities as well as the “devolveds”. I hope I am answering your question but the field looks quite crowded and one of the things which my Committee has been trying to figure out is the shape of this landscape and where the different players fit into it. I would not at this stage be in a position to say the field is too crowded or there is redundancy and overlap. Some of the bodies like the Environment Agency have very clear regulatory remits; we have an advisory remit; UKCIP has a role to engage at a local level with stakeholders on preparing for climate change on the basis of the UK CPO9 climate assessment. One can see how there are distinct roles but as it develops one may form a clearer picture as to whether there are overlaps and duplications. We would certainly want to try to avoid that in our own work.

Q246 Mr Chaytor: As it develops, where do you see the main pressures and challenges in bringing all these different bodies together and moving the whole thing forward?

Professor Lord Krebs: I suppose the story starts really with the role of the Met Office Hadley Centre to provide the underpinning science of climate change. If we are going to adapt we have to have some idea of what it is we are adapting to and what the levels of uncertainty are; the key challenge is dealing with uncertainty in long-term decisions. There is a clear role there that all the different players have in a sense to agree that they are reading from the same scientific script. If we were reading from very different scientific scripts, that would be a bad start. I think there is agreement that the Met Office Hadley Centre’s projections are the starting point. At the other end, in terms of engagement with stakeholders—and I emphasised to the Chairman that is a key element and that we are not going to become a well-adapted society unless the different players who have a role to play buy into the agenda—it is important that we do not introduce stakeholder fatigue by having duplicated stakeholder engagement programmes and that different players may have specialisations. I have already said that UKCIP is particularly concerned at the local level whereas we may see our engagement very much with major players at national level. Defra also has a stakeholder engagement programme and we are seeking to understand more

about what they are doing before we embark on our own. With careful thought and good communication we can achieve the best fitting together of the pieces of the jigsaw without all trying to put ourselves in the same place.

Q247 Mr Chaytor: Earlier you touched on the question of resources. Whatever shape the next government takes it will have to deal with the deficit in some way or another. Where would you prioritise reductions that your Committee would have to take when the time comes, as it will do? What areas could you dispense with?

Professor Lord Krebs: If we actually had to reduce our budget—I am going to turn to Neil who would be the one who would have to decide within his team—as it stands at the moment, with the resource we have, we believe we can fulfil our obligations as laid out in the Act. If the budget were cut we would have to engage in discussions with the Secretary of State, whoever he or she was, to ask which bits of this they wanted us not to deliver, because we would not be able to keep it all.

Q248 Mr Chaytor: The Secretary of State would be asking you to advise him as to which parts.

Professor Lord Krebs: Then it would be an iteration. We are advisory so in that sense we are prepared to offer advice on the areas the Government feel are the most urgent. Let me ask Neil to comment from his perspective.

Mr Golborne: Basically the budget we have is about £819,000, excluding VAT. A large proportion of that is fixed costs, salary for Committee members and salaries for staff, so these are not things you can flex. Roughly 10 to 15% of the budget is stuff that you can flex.² It is a research budget and some expense items. If they asked and the cut were substantial, we would probably need to cut the research element of the budget quite deeply. As someone who has to deliver a programme for the Committee, you are basically into a decision about how to adjust the scale, the scope, the timing of what you are trying to do. We would have to give our advice on a slower timescale if possible or to a different degree of accuracy or scale.

Professor Lord Krebs: We had a discussion in the Committee in fact last week about what our top priority was; another way of coming back on your question. We distinguished between the top priority in the longer term and urgency in the short term. In the short term, that is over the next year, we have to ensure that the Climate Change Risk Assessment, which we have to comment on before it is presented to the Secretary of State, ensures that we have the resource and capability to make that commentary in an effective way. If you ask for our top priority in the longer term, it is to assess and advise on the state of preparedness of the UK to adapt to climate change. We would use that strategic view if we had to respond to Neil’s suggestion that we cut something.

¹ United Kingdom Climate Impacts Programme

² *Note by witness:* The proportion of the budget that can be flexed is closer to 20%.

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We would be looking at it through that lens: we have to deliver our top priority which is assessing the UK's preparedness for climate change.

Q249 Colin Challen: When the first Climate Change Risk Assessment comes out, what benefits do you think will emerge from that assessment to benefit our understanding and so on?

Professor Lord Krebs: I cannot really anticipate precisely the answer to that because the assessment is still in the first few months of the process, so I am in a sense guessing. What the risk assessment aims to do is to provide, where possible, quantitative or semi-quantitative assessments of risks in different sectors and do an associated cost-benefit analysis. The ideal outcome, which I am sure is a kind of optimistic view, is that we would have some semi-quantitative assessment of risk and impact and a cost-benefit analysis of those impacts which would lead to thoughts about alternative routes to adapting to those impacts. Do you build more sea defences or do you relinquish bits of the coast because it is going to be too costly to build sea defences? The other element which should come out is a sense of priorities. One of the difficulties of looking at the whole adaptation agenda is that there are so many things which might need to be attended to, whether it is power generation, telecommunications, transport infrastructure, health, agriculture, food production, water and flood protection and so on. It will give some sense of priorities which we will then be able to advise the Secretary of State on in terms of what the policy implications are and the implications for the adaptation programme that he will develop.

Q250 Colin Challen: It has only really been in the last year or so that the Government have been openly prepared to say that the temperature increase that we may see could go well beyond 2°C. The Met Office and others have said a central estimate of something like 3.9°C by 2080 could be on the cards. Will the assessment reflect a broad range of potential temperature increases and, if it does, what is the central estimate?

Professor Lord Krebs: They are asked to look at a range of future scenarios and I will ask Neil what the central estimate is because I cannot remember. One must not forget the uncertainties. When you say the central estimate might be around 3.9°C, that is with a huge range of uncertainty and I think whatever we get out of the first CCRA, Climate Change Risk Assessment, we must be clear in our minds that this is a work in progress and that we need to come back and repeat the risk assessment as our understanding of the climate system gets better. As I am sure you are aware, the UK CPO9 projections are the first attempt to make probabilistic projections on such a fine spatial resolution of a 25 by 25km grid. The actual climate models which underpin those projections run on a much bigger grid, a 300 by 300 km grid, in which England would be a couple of grid squares. We are pushing the limits of the science and therefore we should take whatever assessment comes out of the CCRA as a provisional view. Part of our job in advising the Secretary of State on the

implications of it will be to balance the provisionality which says it is all too difficult, with some steer which says these are reasonable steps to take even though there is a great deal of uncertainty. Neil, I have given you time to think what the central estimate is.

Mr Golborne: I will give you a range and the central estimate falls somewhere between the two. By the end of the century you have scenarios which give you about 2.5°C of warming globally and at the upper end you are looking at about 4°C. In our advice we have been asking Defra and the contractors to consider as well global mitigation scenarios such as those recommended by the CCC³ in its advice in its 2008 report. That would give you a temperature increase of just over 2°C. These figures are central estimates; there is a lot of uncertainty about those points.

Q251 Colin Challen: Bearing in mind those uncertainties and certainly the regional differences around the world, if you had a two-degree increase just for the UK—it would be very much greater elsewhere—would you be able to say whether a substantial difference was required in effort whether it was 2°C or 4°C or only a marginally greater effort?

Professor Lord Krebs: The general pattern which emerges in all models is that there will be more extreme events, there will be some degree of sea level rise and that could be anything from 0.2 metres to 0.9 metres; those sorts of figures are in contention. There will be increasing periods of drought, particularly in the south-east of England. Those are the general trends. We must also not forget that many of the most severe impacts on us will arise from impacts in other parts of the world and under, for example, a scenario of 4°C global temperature rise, many of the models—not all but many of the models—predict that large parts of the Mediterranean will be a bit more like the Sahara Desert than they are now which would have implications for population movement as well as for production of many kinds of food and beverages which we consume which are produced in Mediterranean countries. In thinking about the difference between 2°C and 4°C, we have to think not just about what is going to happen in our own little island but also how the impacts globally on food supply and human movement patterns and so on will affect us.

Q252 Colin Challen: How much depth will the assessment be able to go into in the wider questions you have raised?

Professor Lord Krebs: That is a good question. The CCRA itself has not been tasked with looking directly at international effects on the UK. However, as I am sure you are aware, the Foresight programme in the Government Office for Science has initiated a short project—I believe about a 12-month project—looking precisely at these issues of impacts of climate change outside the UK on the UK. We will have some data to scrutinise and look at.

³ Committee on Climate Change

Q253 Chairman: If it is just a short project, will it be sufficient? Should we identify where the research gaps are and start focusing on those?

Professor Lord Krebs: I would very much expect that part of the CCRA output and part of our advice to the Secretary of State would be to highlight knowledge gaps; not only the uncertainties but how knowledge gaps might be plugged and uncertainties might be reduced. Yes, we are looking at an evolving story not something which we do for a year and a half and then full stop, draw a line under it. It is going to be an evolving story.

Q254 Colin Challen: Finally, I am just wondering whether the CCRA will not suffer the same fate as the IPCC⁴ reports when people come along afterwards to unpick them and to criticise them for always being out of date and so on. Is that going to be a problem? How robust will they be?

Professor Lord Krebs: An important part of our job is to comment and advise on how robust the CCRA is. We are not waiting until the final report is produced and then reading it and saying “It is rubbish; go away and start again”. We are watching the progress of the contractors, H R Wallingford, as they go along. We have already written two substantive letters of advice to the Secretary of State giving our views on the contractors’ work. What I can say is that when the CCRA is produced, we intend to be as robust as is possible in the time constraints and the resource constraints. I reiterate that it will not be the final answer but we will do our best to make sure that it is robust and provides a sound basis for advice to the Government.

Q255 Chairman: A couple of points. It is one thing for people to adapt by changing their diet because the pattern of global food production is altered by the impact of climate change. It is a slightly more serious matter if we have to have three or four million people suddenly. Is the pretty substantial and broad implication of possible large-scale population movement something that you will be expressly considering?

Professor Lord Krebs: In so far as the Foresight study gives us a basis for commenting on that, we would wish to include that in our comments. I should mention—again as I am sure you are aware—that there is also a Foresight study on migration going on at the same time. There is also a Foresight study on global food security and these will also, in so far as they produce results, be relevant to our thinking as we develop our advice.

Q256 Martin Horwood: Quite a lot of the areas of responsibility that you have talked about, including things like agriculture and health, are clearly UK-wide, as is your remit. But in detail they are often the responsibility of different administrations; devolved administrations in Scotland and Wales and some of the larger autonomous bits of government like the NHS, the Environment Agency on flood risk

management. Are you going to be looking at sharing best practice across and between these institutional and governmental boundaries?

Professor Lord Krebs: I certainly think there should be sharing of best practice. One of the benefits of having a diversity of administrations is that different administrations may develop different approaches and we would be in a position to comment on those and offer advice across. So yes, I would say that as we move forward that would be something we would wish to comment on.

Q257 Martin Horwood: That comment could get quite controversial, could it not, if you were saying that the Scottish Government was not as far advanced in its adaptation policy as the English administration of the UK Government; it could get quite heated. Are you prepared to step into that kind of controversy?

Professor Lord Krebs: Yes, we are not here to avoid controversy, if controversy is necessary. We are not here to mince our words. We would be quite straightforward. What for us is very important in terms of our reputation is that we root everything we say in clear analysis and in evidence. We would not be expressing an opinion that was drawn out of thin air. If we had a firm enough evidence base and an analytical base to make an assertion, we would wish to make it.

Q258 Martin Horwood: In other evidence we have heard about how in some bits of adaptation strategy, flood risk management is a good example but health would be another one, there are third parties like the insurance industry who might start to qualify their flood risk cover for home insurance and might start to qualify their life cover for heat waves or something like that if the Government are not seen to be living up to their part of the bargain. Are you going to step into territory like that and comment on whether or not something like the flood risk management strategy is adequate or the NHS’s adaptation strategy for higher temperatures is adequate?

Professor Lord Krebs: We do have a role to comment on the departmental adaptation plans and that is something we will be undertaking as these plans are produced over the year ahead. We have also been asked by Defra to comment on the bodies which will be required to report to the Secretary of State under the Reporting Powers’ authority in the Act. We have said that we would not be able to comment on every single report individually but we will take an overview of certain sectors. In that sense, commenting on the preparedness of different sectors and different government departments for dealing with the challenge of adaptation of climate change is clearly part of our remit and we will comment and those comments will be in the public domain.

Q259 Martin Horwood: Just to be clear, would that kind of comment extend to devolved administrations and to bodies like the NHS Executive at national level?

⁴ Intergovernmental Panel on Climate Change

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Mr Golborne: Yes, because there is of course a separate Scottish Climate Change Act, to take Scotland as an example. As far as I am aware, the Adaptation Sub-Committee does have a requirement to advise on the Scottish programme, so I would see it as compatible with that. For example, if we have an assessment of risks in-house or from the CCRA, we were advising on the delivery of their programme over time, then we could get into discussions about the state of preparedness in Scotland. At some point in the future, the Scots may decide to set up their own equivalent of the Adaptation Sub-Committee.

Q260 Martin Horwood: The other question was about authorities like the NHS or the Environment Agency. If they were reporting to you, would you expect to be commenting on the quality of their adaptation plan and by implication the amount of money they might be getting for it from government?

Mr Golborne: Certainly I am sure we would be looking at the Reporting Power submission from the Environment Agency. There is an opportunity there for the Committee to raise any issues where it feels that there is a vulnerability.

Q261 Jo Swinson: You mentioned there the possibility that Scotland might set up its own Adaptation Sub-Committee. Is it your view that it would be better to have that expertise contained within the one committee with that cross-UK remit?

Mr Golborne: It is not something the Committee have considered and to be perfectly honest it is probably a matter for the Scots not for us.

Q262 Jo Swinson: So you would work within whatever structure?

Mr Golborne: Yes, we will work within the existing structure.

Q263 Jo Swinson: In terms of mitigation it could be argued that Scotland is somewhat ahead of the rest of the UK, certainly having set more ambitious targets. Have you come to any assessment yet whether any parts of the UK are further ahead in adaptation that perhaps we could be learning from or are we equally at the beginning stages across the board?

Professor Lord Krebs: We are at very early stages, but one group of organisations that one might refer to in this context are local authorities. Local authorities have the option of reporting on their adaptation plans under what is called the National Indicator 188. I believe that about one third of local authorities in England have chosen to report under this particular option, that is 149 of them, and of those 149 one has reached what is called level three; there are four levels, nought, one, two and three.⁵ Stockton-on-Tees is the local authority which has an adaptation plan which is fully developed and at the implementation stage. There might well be an opportunity for the remaining local authorities to understand why Stockton-on-Tees has got to where

it has, what steps it has taken and perhaps to look at its plan and see whether that plan is applicable to other local authorities. I can see that as an example of where there is an opportunity to learn from one part of the country and perhaps apply those lessons to other parts of the country. If you break it down another way by different risks, perhaps the area in which the UK has given the most thought is flood risk, particularly the Environment Agency's work on the Thames estuary and the Thames barrier in what is called the TE2100 programme. They have looked forward under different climate scenarios at what measures would have to be taken to protect London from flood risk from the rising sea level and extreme events. That provides an interesting model, which the Climate Change Risk Assessment will apply more generally where possible and where appropriate, of a decision tree moving forward through time. In a sense you have to make decisions now which will have an impact in 10, 20, 30 years', 50 years' time but those decisions also have to be proportionate to the risk. You are in a situation where you are trying to decide what investment we need to make now to keep us at an acceptable level of safety until we have a greater understanding of the risks, at which point we might want to make greater investment. That kind of sequential approach to decision making, again picking up on your point about lessons which might be applicable, could be applicable in other areas, perhaps in health, perhaps in transport infrastructure, perhaps in energy, for instance.

Q264 Jo Swinson: Just to pick up on the Climate Risk Assessment, you mentioned the possibility of population moving here and the Mediterranean changes. Will you also be advising on the impacts for British businesses whether that is different crop growing cycles within the UK, different fish stocks or indeed what will happen to the ski industry in Aviemore?

Professor Lord Krebs: You highlight a very important point which is that we should not view adaptation purely as a negative. There may be new business opportunities there in tourism, in food production or indeed opportunities for UK industry to help with adaptation in other countries; if the construction industry gets involved in building flood defences in other countries that could be an opportunity. I think part of our stakeholder engagement role, along with others, is to understand how business sees the opportunities as well as the threats. It would probably be presumptuous of us to think that we could advise business where they should seek opportunities. They will have their antennae and their intelligence. What we can help them with is understanding what the science is saying and also perhaps to raise awareness more generally across different sectors of business.

Q265 Mr Chaytor: Returning to the question of reporting, you have freely acknowledged that you cannot particularly comment on all the reports of the 1,000-plus organisations who will write a report.

⁵ *Note by witness:* There are actually five levels (nought, one, two, three and four) rather than four.

26 January 2010 Professor Lord John Krebs and Mr Neil Golborne

Is the burden of reporting as set out in the Act too great? If you cannot do it and Defra are unlikely to do it, why are all these reports being published?

Professor Lord Krebs: There are two parts to that. One is whether the details of what is required under the Reporting Powers are too onerous either for the companies or the public bodies to fill in. Second, whether anybody is going to read them once they are filled in. Clearly it is important, as part of our assessment of preparedness, to understand what the key players are doing. So we have to have some information. What we have said is simply that in the time allowed and with the resource we have we cannot possibly read every single individual report. My understanding—and I will ask Neil to confirm or

correct me—is that Defra will, perhaps through a consultancy, get somebody to condense down the reports into groupings, perhaps by sectors, and we will then comment on those overviews and perhaps dip deep in a few cases just to check that we agree with what the consultants have said. I think that is the approach. Have I got it right?

Mr Golborne: Yes, you have.

Q266 Chairman: We will draw to a close there. Thank you very much indeed for coming in. I hope we can keep in touch with you on these issues.

Professor Lord Krebs: Thank you very much. I very much look forward to keeping in touch and thank you for your time this afternoon.

Memorandum submitted by the Department for Environment, Food and Rural Affairs (Defra)

INTRODUCTION

1. The Earth's climate is changing. Global temperatures are predicted to continue rising, bringing changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather for the UK. We will also face the indirect domestic impacts of international climate change, which pose further challenges. The extent of change will depend greatly on how successfully the world cuts its greenhouse gas emissions.

2. Published on 18 June, the UK Climate Projections 2009 (UKCP09) show that although reducing greenhouse gas emissions is critical to avoid the most dangerous effects of climate change, past emissions mean that some changes are now inevitable whatever we do. Taken together with other evidence, the latest Projections show that the UK is faced with warmer wetter winters, hotter drier summers, and more frequent extreme weather events. It will also be affected by the impacts of climate change occurring in other countries. It is therefore vital that we plan and prepare for these changes—whether in the design of school buildings or the protection of new power plants, maintaining the supply of drinking water, adjusting farming methods for drier summers, or understanding how our homes and businesses will have to adapt.

3. The Government are leading action nationally and internationally on climate change adaptation—domestically through the cross-Government Adapting to Climate Change Programme (ACC Programme), which is co-ordinated by Defra. The ACC Programme will co-ordinate and drive forward the development of the Government's work on adaptation in the future, to make sure there is action to deal with the consequences of a changing climate resulting from increased levels of greenhouse gases. Adaptation is a devolved issue and, following the example of the NAO briefing commissioned for the EAC's inquiry, this response 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. Coverage is also focused on Government policy on domestic climate change adaptation, rather than action internationally to help developing nations adapt to climate change.

4. As the NAO report reflects, the work of the ACC Programme on adaptation, and across Government, is at an early stage and the material contained within this memorandum represents work in progress. All Government Departments are working towards practical adaptation on the ground, in our schools and hospitals, transport networks and businesses. With resources limited, there is greater pressure to ensure that we adapt wherever possible through our mainstream service delivery, rather than viewing adaptation as an “add-on”, emphasising the importance of a successful systematic approach that will deliver practical results for the long term.

5. This memorandum has been prepared by Defra in collaboration with and on behalf of those Government Departments covered by the NAO report to this Committee on Government adaptation. The main body of the memorandum addresses in turn the questions posed by the EAC inquiry, focusing on the work of the ACC Programme and cross-Government activity. Examples of direct adaptation by Government Departments are provided in Annex A under six main themes—business and economy; infrastructure; agriculture, food security and the natural environment; homes and buildings; public health; and flooding and coastal erosion.

SUMMARY OF PROGRESS

6. The work of the ACC Programme is organised across 4 key themes: 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; and measuring success and taking steps to ensure effective delivery. ACC is an “enabling” programme, bringing together and taking forward work across Government. The Climate Change Act 2008 has established a statutory framework for adaptation, driving us towards preparing a National Adaptation Programme by 2012. Through this statutory Programme, and through reporting to Parliament, the Government will ensure that adaptation becomes embedded across Departments, and by other public bodies, businesses and individuals.

7. Since spring 2009, when the National Audit Office (NAO) carried out its review of Government policy on adapting to climate change, further progress has been made towards this goal. This includes:

STRONGER EVIDENCE

- the launch of the new UK Climate Projections in June 2009 is a major step forward, demonstrating the reality of a changing climate for the UK. UKCP09 represents strong and credible science. It begins to quantify the uncertainties we face and helps us to understand the risks that lie ahead. The Projections can be used by both the private and public sector to explore the risks for their organisations over the coming decades; and
- the Government are committed to carrying out a UK Climate Change Risk Assessment every five years (and will complete the first cycle of reporting by end-January 2012). This will include an Adaptation Economic Analysis to identify the scale of costs and benefits of adaptation. We have already completed a scoping study to explore options for the project and identify which of these are critical to producing a successful risk assessment and we published the results in June 2009. We have now contracted a consortium to undertake the CCRA and work is now under way.

EMBEDDING ADAPTATION

- all Government Departments have committed to producing Departmental Adaptation Plans (DAPs) by spring 2010; these will set out how they are assessing and managing the risks from climate change to their policies, programmes, and estates. Departments have already started work on their Plans using agreed new guidance. Departments are strongly encouraged to develop these plans alongside the Carbon Reduction Delivery Plans, which DECC has recently commissioned, and, if possible, to work towards the production of a joint “Climate Change Plan”, which addresses any connections or interdependencies between mitigation and adaptation actions;
- The Climate Change Act 2008 gives the Secretary of State the power to direct “reporting authorities” in the wider public sector to report on their assessment of current and future climate change impacts and their proposals for adaptation. A public consultation on the use of the Reporting Power ended on 9 September and we received 65 responses. These are currently being considered and views of organisations will inform the Government’s strategy for reporting, which will be laid before Parliament by 26 November 2009;
- the ACC Programme and HM Treasury published revised Government appraisal guidance in June 2009. The supplement to the Government’s own project, policy and programme appraisal guidance (the “Green Book”) will help better embed climate change risk management in all public spending, and ensure that policy and investment decisions take account of adaptation;
- Defra is consulting on the inclusion of adaptation within the Sustainable Operations on the Government Estate (SOGE) targets to monitor Departments’ progress in adapting their estates; and
- the ACC Programme also has a team working with colleagues across Defra and Government on how we can work with the EU to embed adaptation in EU policies and programmes, further to the publication of the European Commission’s Adapting to Climate Change White Paper published in April 2009.

AWARENESS-RAISING

- the Projections in Practice awareness programme—aimed at a range of different sectors, regions and themes—continues to be very well attended and is helping policy makers from local and national government, third sector organisations, businesses, and members of professional organisations better to understand UKCP09 and how it can be used to support adaptation planning;
- the Adapting to Climate Change website provides a full range of information about UKCP09, the latest Government action, and what individuals can do to adapt to a changing climate; and

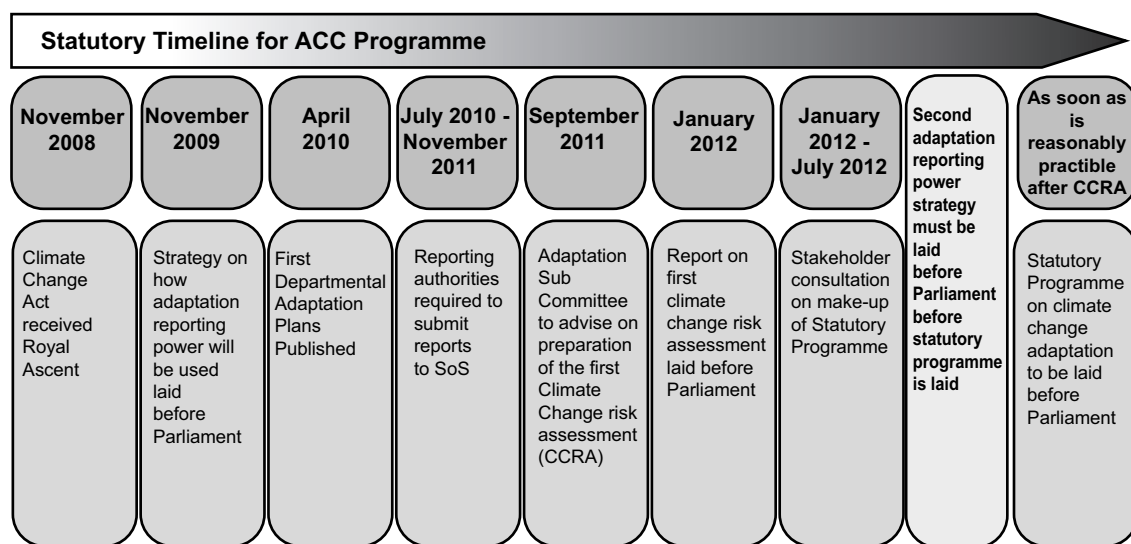
- funded primarily by Defra, the UK Climate Impacts Programme (UKCIP) is an advisory service, helping a range of organisations from the public, private and third sectors to boost their understanding of the need for adaptation action, and to provide and promote information and tools needed to take action. The work of UKCIP is a key part of the process of raising awareness of UKCP09.

MEASURING PROGRESS

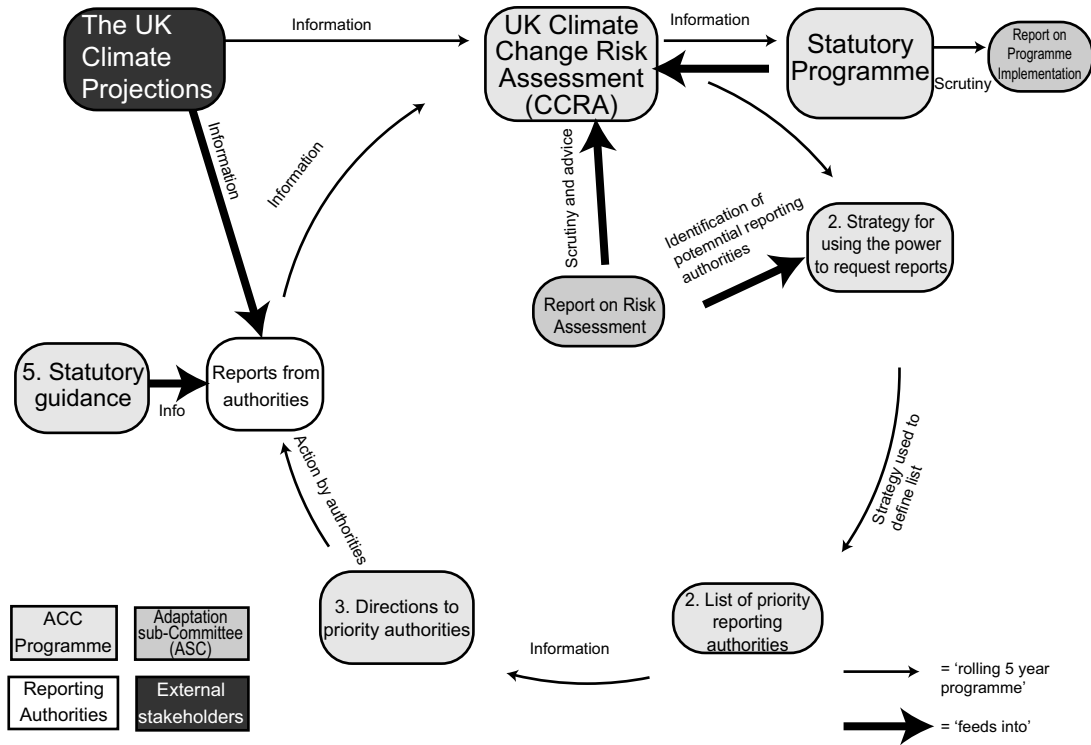
- in 2008, the Government introduced a new indicator on adaptation, National Indicator (NI) 188. NI188 allows all local authorities to assess their progress against five levels of achievement from completion of a climate risk assessment to a comprehensive action plan and monitoring process. 56 of 150 local areas have chosen 188 as a priority in this round of Local Area Agreements. In this first year of operation, 82% of these local authorities met or exceeded their agreed targets for performance. Beyond this, just under half of all local authorities have assessed themselves as Level 1 or above which means as a minimum they have made a public commitment to identify and manage climate risks and have identified their key priority risks. Further work is now in train, looking at the guidance and support that local strategic partnerships will need in future; and
- the Adaptation Sub-Committee (ASC) of the Committee on Climate Change has a statutory role to provide an assessment of progress towards implementing the objectives, proposals and policies of the ACC Programme. The ASC’s Chair, Professor Lord Krebs, was appointed at the end of May 2009. A further six board members were appointed at the end of June 2009, and two additional members will be appointed over the autumn.

The following diagrams illustrate the timeline, relationships and processes governing the key statutory and governmental elements of the ACC Programme. This should provide a point of reference for the narrative material provided below in response to the Inquiry’s key questions.

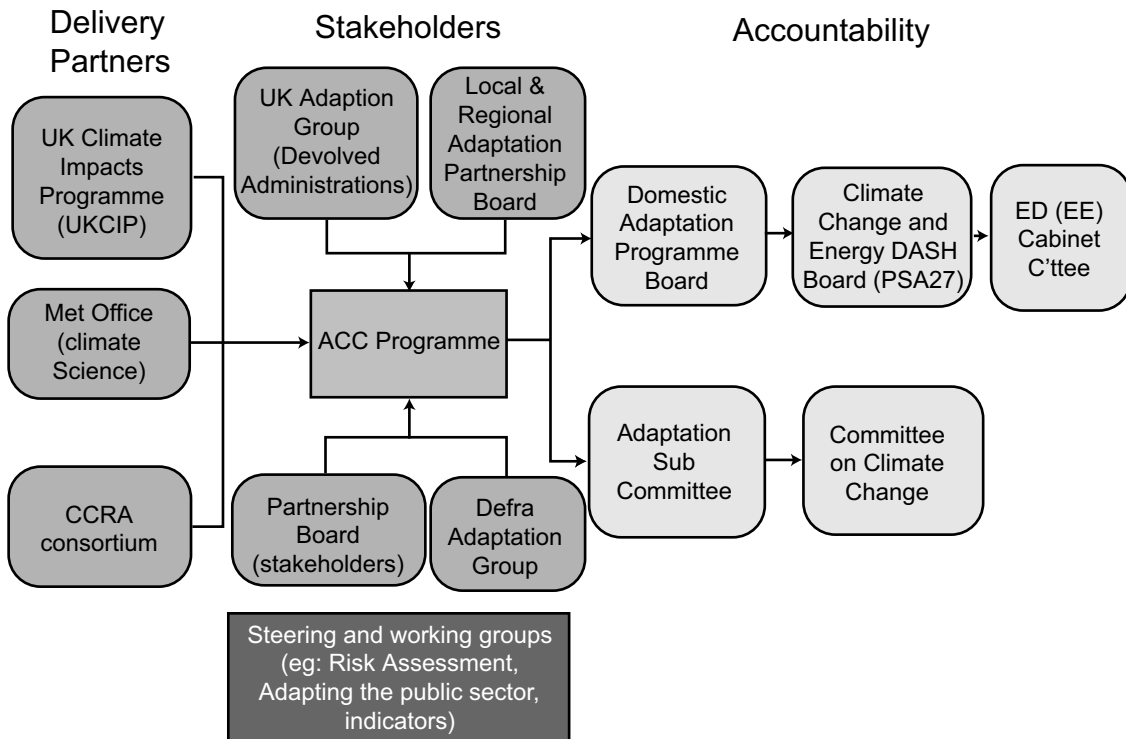
TIMELINE FOR KEY ACC PROGRAMME ACTIVITIES



PROCESS FOR IMPLEMENTING STATUTORY FRAMEWORK



PROGRAMME GOVERNANCE AND SCRUTINY OF STATUTORY ADAPTATION AND THE ACC PROGRAMME



How far will the ACC Programme increase resilience by embedding adaptation and climate change risk assessment into the work of Government Departments?

Departmental Adaptation Plans, to be published in Spring 2010, will set out what practical steps each Government Department will take over the next two years to safeguard its policy objectives and programmes, and to improve leadership and delivery of adaptation by making relevant changes to operational systems and processes. Further projects within the ACC Programme will provide practical support for this in relation to adaptation of infrastructure, the Government estate and public procurement.

8. The recent review from the National Audit Office (NAO) on climate change adaptation (July 2009) found that all Departments have made a start in considering key climate change impacts. However, considerable variation exists in terms of progress to-date and capability within Departments and the ACC Programme is continuing to work to embed adaptation into Government policies, programmes and systems.

9. In June 2009, the Government announced that all Government Departments will produce Adaptation Plans by spring 2010. These will focus on the policy objectives and activities likely to be significantly affected by climate change and therefore require immediate consideration (such as major construction projects). At the same time, Adaptation Plans will define action to build capacity within Departments to deal systematically with climate change in the longer-term. The ACC Programme is working closely with DECC to align Adaptation Plans with their work on greenhouse gas reduction, with the expectation that, where appropriate, Departments will produce combined Climate Change Plans setting out a comprehensive approach to mitigation and adaptation. Departmental Adaptation Plans will also be an important building block in the development of the Government's first statutory National Adaptation Programme, due to be put to Parliament in 2012. This will be monitored by the Adaptation Sub-Committee of the Climate Change Committee. Departmental Adaptation Plans will be updated annually and substantially revised every five years.

10. The first Adaptation Plans in spring 2010 will help to demonstrate how all Departments are considering adaptation. The Plans are intended to benefit:

- Departments themselves (by improving planning and preparedness to manage inevitable climate change);
- the Government as a whole (by enabling Departments to look at the links between them, and by allowing best practice to be shared); and
- business, communities and the general public (by boosting confidence and offering assurance that Government are demonstrating leadership).

11. Defra has funded the establishment of a new "Adapting Government" team within the ACC Programme to encourage progress across Whitehall, and provide appropriate guidance and support.

12. Further activity to ensure that the long-term consequences of climate change are being taken into account across Government includes:

- a two-year (to March 2011) cross-Government project, led by the ACC Programme, looking at how to increase the long-term resilience of infrastructure in the energy, transport and water sectors to the impacts of climate change. The work will identify the technical and operational implications of long-term climate change on the three sectors and recommend solutions to overcome any barriers. Findings from the project will inform future governmental adaptation work;
- as part of a Whitehall-wide consultation on a revised set of targets for Sustainable Operations on the Government Estate (SOGE), all Departments are being asked to consider a proposed new indicator and target covering adaptation. This will require implementation and monitoring of measures and changes to adapt to the effects of a changing climate. Views are being sought on whether this should be delivered by Departments through the SOGE framework, or alternatively via the Office of Government Commerce's (OGC) High Performing Property Programme;
- the ACC Programme is working closely with OGC to develop guidance on how to incorporate climate change adaptation within the public procurement process. Guidance, which is expected to be published in spring 2010, will be relevant for Departments, agencies and the wider public sector;
- Government Departments have been closely involved with the Steering Group set up to guide the UK Climate Change Risk Assessment (CCRA), and will be consulted throughout the project. This should ensure that the CCRA is relevant and its findings of practical use to Departments for future adaptation planning; and
- the statutory adaptation Reporting Power will be an important source of information for Departments on climate change risks affecting organisations in their key sectors, and the adaptation needed to increase resilience.

To what extent have Government Departments identified the risks from a changing climate that will stop them from meeting their objectives?

The NAO report provides a benchmark assessment of Departmental progress. Departmental Adaptation Plans will build on this foundation, requiring Departments to consider risks across all of their Departmental Strategic Objectives and agree practical action to address priority risks by spring 2010. This work will feed into the national Climate Change Risk Assessment, to which all Government Departments will contribute. The CCRA will report on key national risks in January 2012.

13. The above-mentioned NAO briefing presents Departments' self-assessments of their current progress in assessing and managing risks from the future impacts of climate change. The NAO found "signs of growing awareness and understanding, progress in identifying and assessing risks, and examples of individual policy responses". However, considerable variation exists; for instance, some Departments are already getting on with assessing and managing climate change impacts, whereas others are only just "getting started" in terms of building capacity to assess and manage these risks.

14. The latest climate projections (UKCP09) will help Departments to develop more detailed and informed risk assessments (although it will take some time for this information to translate into impacts and to help determine future actions). The development of Adaptation Plans should encourage Departments to engage with this information as they continue to define the climate change impacts on their strategic objectives and the role that adaptation will play in the successful delivery of these objectives. These Plans should also give assurance that individual Departments are preparing appropriately to safeguard their longer-term operations and build capacity to adapt to climate change for the future. As a minimum, each published plan should:

- set out a Department's priorities for adapting to climate change, highlighting which particular climate impacts pose the greatest threat, and making clear how it will demonstrate leadership;
- set out what will be done to address each major policy priority—at the level of Departmental Strategic Objectives (DSOs). This should give particular consideration to planned policy development where proposed strategies or new legislation will have a long term legacy;
- show how the Department will build capacity for climate change adaptation in terms of leadership, the development of resources and skills, and embedding of adaptation in core processes (such as procurement, or the use of impact assessments as part of the policy-making process); and
- summarise any major planned investment in estates and assets, to ensure that adaptation can be addressed from the outset—ie as part of planning and design.

15. Departments will be able to access support and guidance from the ACC Programme to help them in developing their Adaptation Plans. The involvement of Departments in the Climate Change Risk Assessment process will also help to highlight risks to their objectives.

How suitable are the processes and structures in and across Government Departments for identifying, mitigating and managing these risks and determining the future priorities of central Government's approach to adaptation (and the National Adaptation Programme)?

The extent and suitability of current Departmental structures for identifying and managing climate risks varies, but will be strengthened through the application of systematic Guidance for the production of Departmental Adaptation Plans by Spring 2010. This work will complement and inform the development and implementation of the first statutory national Climate Change Risk Assessment (CCRA). Together, Departmental Adaptation Plans, Reports from authorities and the CCRA will be a significant step forward in providing a comprehensive picture of national climate impacts and risks, and will inform the development of the statutory programme.

16. The NAO report identifies differential progress between Departments in ensuring that their operational systems and processes systematically identify and address climate impacts and risks. New Departmental Adaptation Plans will set out the practical steps each Department will take to improve these systems and build its adaptive capacity. ACC Guidance on Adaptation Plans builds on the work of the NAO in requiring Departments to identify actions needed to improve leadership; people and skills; policy and strategy; operational systems; and estates. As a minimum step to improve leadership of adaptation, all Departments will identify a Senior Owner at Management Board level who can take overall responsibility for adaptation. This will help actively to engage people across the Department, drive work forward, and deliver an effective and action-orientated Adaptation Plan.

17. In many cases, successful adaptation will require co-ordinated cross-Departmental action. The process of developing Adaptation Plans will allow Departments to consider systematically the need for more joint working with other parts of Whitehall. These Plans will set out information on how Departments will work collaboratively (including with stakeholders) to address key barriers to adaptation, or undertake specific actions to promote adaptation by other sectors. The cross-Government Domestic Adaptation Programme Board will examine progress against this objective and provide opportunities to challenge emerging priorities and actions and the processes that individual Departments are following.

18. The Climate Change Act 2008 introduced a new adaptation Reporting Power, which enables the Secretary of State to direct public bodies and statutory undertakers (companies such as water and energy utilities) to report on climate change risks to their activities (this is discussed in more detail below). We will set out our strategy for use of this power to Parliament by 26 November 2009. These reports will include an assessment of potential climate change impacts and set out an action plan to address these risks. Once the first round of reports has been received in 2011, Departments will be able to use future iterations of their Adaptation Plans to summarise the key risks and actions highlighted within their sectors and where necessary how they will be reflecting these in their own work. The ACC Programme is continuing to work with partners such as the UK Climate Impacts Programme (UKCIP) to help in promoting and sharing the latest UK Climate Projections actively with other Departments and sectors, which will drive improved identification of climate risks.

19. In addition, the Climate Change Act establishes that a UK-wide Climate Change Risk Assessment (CCRA) must take place every five years. A National Adaptation Programme (NAP) will respond to the CCRA, addressing the key areas it identifies. The Government's intention is to have the first NAP in place in 2012. Work undertaken by Departments in the context of their Adaptation Plans (eg in identifying key priorities and improving their evidence and understanding of climate risks) will inform the development of the statutory risk assessment and the national programme. Subsequent Departmental Adaptation Plans from 2012 onwards will follow and be informed by the CCRA cycle and closely aligned with the overall NAP.

How well has the overall direction for work on adaptation been set, the effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance), the allocation of powers and duties?

The Climate Change Act 2008 sets a clear framework for action across Government and the wider public sector, based around comprehensive risk assessment, a statutory National Adaptation Programme and statutory reporting by operators of essential public services and infrastructure. All elements of this framework will be operational by the end of 2012. Work by the ACC Programme to date has set a clear direction for the implementation of the statutory framework and this has been widely endorsed by stakeholders through recent consultation on the use of the statutory Reporting Power and engagement in the development of our approach for the national Climate Change Risk Assessment. Regular scrutiny of the direction and effectiveness of adaptation will be the responsibility of the new Adaptation Sub Committee of the independent Committee on Climate Change.

20. Parliament has set the overall direction for work on adaptation in the context of the Climate Change Act 2008, which establishes that:

- a UK-wide Climate Change Risk Assessment must take place every five years;
- a National Adaptation Programme must be put in place and reviewed every five years to address the most pressing climate change risks to England;
- the Government may require public authorities and statutory undertakers to report on how they have assessed the risks of climate change to their work, and what they are doing to address these risks;
- the Government are required to publish a strategy outlining how this new power will be used, and identifying the priority organisations that will be covered by it; and
- the Government will provide statutory guidance on how to undertake a climate risk assessment and draw up an adaptation action plan.

21. The decision to place action on climate change adaptation on a formal, legal basis demonstrated the Government's commitment to ensuring that the UK is prepared to adapt to the impacts of climate change. An Adaptation Sub-Committee (ASC) of the independent Committee on Climate Change has been established to ensure that the Government's programme for adaptation enables the UK to prepare effectively for these impacts in order to minimise harm—and exploit any opportunities—that may arise.

22. The first part of the statutory framework to be used is the adaptation Reporting Power. As above, the Climate Change Act 2008 gave the Secretary of State the power to ask public sector organisations, and statutory undertakers (such as energy and water companies), to report on their assessment of the risks that climate change poses to their interests and activities, and the actions they will need to take in response.

23. Since 18 June 2009, Defra has been consulting publicly on the key questions associated with the proposed use of the new power, and seeking views on:

- our proposed strategy for using the reporting power including the proposed list of priority reporting authorities (those sectors and organisations that are essential to the country's ability to adapt to the impacts of climate change);
- draft Statutory Guidance to reporting authorities (intended to support those organisations going through the process of assessing the risks from climate change and drawing up adaptation plans); and
- an Impact Assessment, forecasting the costs and benefits associated with the proposals.

24. The closing date for responses to this consultation was 9 September 2009. Responses are currently being analysed and the final strategy for use of the Reporting Power, and we will present the list of reporting authorities to Parliament by 26 November 2009.

25. Those responding to the consultation are overwhelmingly clear that we have set the right direction for the priority organisations who we will ask to report on their adaptation plans. We have had considerable levels of support for the criteria that we have used, and the proportionate way in which we are proposing to use the power. The consultation responses have been very favourable about the use of the Reporting Power and statutory guidance. Where there have been suggestions for change, it is generally on the basis that the statute does not give the Government enough levers over the private sector—such as the agricultural industry, food sector or electronic communications.

26. The publication of the statutory National Adaptation Programme will influence our future strategies for using the adaptation Reporting Power. As above, the Government need to lay their first report on the use of the Reporting Power before Parliament in November 2009, and will produce the first Climate Change Risk Assessment by January 2012. The second strategy for using the Reporting Power (including any changes to the list of priority reporting authorities) and the National Adaptation Programme will follow within a year of the publication of the Risk Assessment. All of these outputs are linked and both the reports and the CCRA will feed information into the National Adaptation Programme.

27. The overall (non-statutory) direction of work for the ACC Programme has been set in themes as described at paragraph 4, above. Feedback from stakeholders has generally been positive that these are the right areas to concentrate on in an enabling Programme at this stage in public understanding of adaptation. We will be reviewing these in the longer-term as many of the individual projects under the ACC Programme deliver their first outputs and as adaptation policy and delivery become more mature.

How well are issues like social justice addressed in adaptation policies?

Equity is a key objective of the ACC Programme. Social justice is addressed through practical delivery work, such as the Environment Agency action to promote effective adaptation to coastal erosion in different socio-economic contexts, as well as being systematically embedded in adaptation policy through the Green Book Supplementary Guidance, which promotes equity as one of three essential benchmarks of well-designed adaptation. Cross-Government work on Departmental Adaptation Plans will also consider and address the collective impact of Departmental adaptation responses on different communities and groups of vulnerable citizens.

28. New supplementary “Green Book” Guidance on Accounting for the Effects of Climate Change (published in June 2009) emphasises that well-designed adaptation measures should be effective, efficient and equitable. The Guidance goes on to stress that: “Some of the groups most vulnerable to the effects of climate change may also be least able to adapt to the effects of climate change. It will not be possible to avoid all of the costs imposed by climate change. The distributional consequences of different options should be analysed to inform decision-makers of the effects of the activity on different groups”.

29. The Green Book methodology should be used to make an economic assessment of the social costs and benefits of all new Government policies projects and programmes. For example, the Environment Agency, which is responsible for maintaining and building new flood defences across England and Wales, uses data on past flooding and flood forecasting techniques to predict the likely extent and impact of future flooding. The Agency uses this type of information to make equitable, rational and proportionate decisions about where and how it spends public money to reduce flood risk, and target these resources to areas and communities with most need. For the future, Defra has launched a consultation on how coastal communities can successfully adapt to the impacts of coastal change, and Government’s role in supporting this, recognising that successful adaptation will depend on a wide variety of socio-economic conditions; for instance, some locations will have high levels of social well-being, with other locations facing greater levels of deprivation. The Government will announce the outcome of this consultation in the autumn.

Have short-term priorities for action including identifying and protecting key infrastructure and systems (for example power, food, water, transport infrastructure, defence and security) been identified and how are these being addressed?

The ACC Programme has systematically identified and prioritised key national infrastructure and systems through work on the Adaptation Reporting Power and Infrastructure projects, regarding which short-term action will be delivered in the next two years. The Reporting Power consultation identifies 103 providers of key public services, including power, food, water and transport infrastructure, each of which will (if so directed) conduct and report on its own risk assessments and adaptation actions within two years. This will be supplemented by new National Policy Statements covering energy generation and transport. These will ensure climate risk is considered in the design and build of new large infrastructure.

30. Departments are considering short-term priorities for action in relation to infrastructure and systems. For example:

- forthcoming National Policy Statements issued by DECC and DfT will provide clear guidance for applicants and a decision-making framework for the Infrastructure Planning Commission. These will ensure that all new nationally significant infrastructure will be located, designed, and built with the long-term impacts of climate change in mind. National Policy Statements for the energy infrastructure and ports sectors are expected to be issued shortly for public consultation;
- the Cabinet Office is undertaking an assessment of the vulnerability of critical national infrastructure to flooding and other natural hazards and is working with the relevant lead Departments, economic regulators and operators to reduce those vulnerabilities. The ACC Programme is working closely with the Cabinet Office to ensure consistency and share good practice; and
- the adaptation Reporting Power and the development of Departmental Adaptation Plans will provide new mechanisms for systematically considering climate change risks to key policy objectives, systems and infrastructure and identifying short-term priorities for action.

31. Annex A (attached) provides examples of the latest specific adaptation measures which Departments are taking, including those to protect key infrastructure and systems.

What progress is being made in monitoring and evaluation of work on adaptation? How can progress on adaptation can be quantified and success measured?

Quantitative measurement of successful adaptation is challenging in the short term, as outcomes may take decades to realise. In the short term, Departmental Adaptation Plans; national indicators for adaptation in the local government sector; proposed new indicators covering adaptation of the Government estate; and milestones from Reporting Authorities' action plans will enable us to measure progress. For the longer term, an ACC Programme project to develop a suite of indicators for adaptation will provide more qualitative, outcome-focused basis for measuring success.

32. As the NAO briefing noted, "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". Against this background, the ACC Programme is continuing its work to develop a suite of indicators for adaptation, but it remains at an early stage and there is currently little we can draw on in terms of accepted methodology for evaluation of work on adaptation. Our approach is therefore to focus on building adaptive capacity, taking account of information generated by many of the current work-streams within the ACC Programme. The NAO's survey on adaptation cross-Government has also contributed to the development of a baseline of adaptive capacity on which we could build. Furthermore we will seek to complement these measures of adaptive capacity with outcome-focused indicators. However, we fully recognise the need to strike a suitable balance between the complexity inherent in each potential outcome indicator and associated resource intensity of this approach.

33. That said:

- Departmental Adaptation Plans should define the key risks identified to a Department's strategic objectives as a result of climate change and the role that adaptation should play in the successful delivery of these objectives. The Plans should also give assurance that the Department is preparing appropriately to safeguard its longer-term operations and capacity to adapt to climate change for the future;
- an indicator for adaptation is included in the new local government performance framework (NI 188), and all local authorities and local strategic partnerships (LSPs) are required to report on their progress annually. To learn lessons from the first year of its use, the ACC Programme commissioned a review of the year 1 indicator reports. The main message was that the majority of local authorities have met the targets set for performance. Areas for further improvement to build on this success include considering the significance that partnership-working plays in making progress, sharing methodologies, and providing tangible examples of how to make the step from planning and identifying risks to taking action. The report will form part of the evidence for agreeing with our partners (LGA, RDAs, NE, EA and a cross-section of local authorities) the priorities for the next three years and to consider what additional guidance and support LSPs may need in the future; and
- the ACC Programme is currently developing a strategy for the use of the new statutory Reporting Power. This will require public bodies and statutory undertakers to report on the likely impacts of climate change and how they plan to address them. Through the process of issuing Statutory Guidance to reporting authorities, our approach also stresses the importance of monitoring and evaluating the effectiveness of actions to address key risks and deliver adaptation actions.

What funding, support, training and other resources are available, including at local and regional level, for: building capacity to adapt to climate change; helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take?

Investment in the Government's ACC Programme has been increased to provide greater support and resources for adaptation at all levels (national, regional, local and organisational) and now totals £9 million annually. The ACC Programme team and its externally funded organisations provide a broad range of support to other Government Departments, regional bodies, local government, public services and business. This includes promotional work to raise awareness and understanding of projections, through regional and sector events; training and guidance in interpreting and using the scientific data and climate projections; guidance in undertaking risk assessment; and funding and support for Regional Climate Change Partnerships to build capacity at that level.

34. The NAO briefing set out the significant resource that Defra has committed to driving forward the ACC Programme. At the time of writing, the Defra ACC Programme team has 34.5 members of staff. For 2009–10, the Programme budget allocation remains at just under £2 million, and the research budget just under £7 million. As above, this includes provision for offering support to other Departments as they work to develop their high-level Adaptation Plans, and we anticipate that a team will remain in place to guide those organisations asked to report on their preparations for responding to climate change under the adaptation Reporting Power. In particular, key investment by the Government and the ACC Programme includes:

- approximately £11 million in developing the June 2009 “UK Climate Projections 2009”;
- around £900,000 a year to UKCIP to support its work in providing training, climate change data and specialist expertise across a range of sectors;
- approximately £1.5 million to support the development of the CCRA during 2010–11;
- £200,000 to support the first year of work on an “Infrastructure and Adaptation” project, which will continue into 2010;
- in 2008, Defra committed to supporting the nine independent Regional Climate Change Partnerships until 2011. £450,000 was made available in 2008–09, with a further £405,000 available each year in 2009–10 and 2010–11; and
- committing an additional £50,000 towards rolling out a series of “Projections in Practice” (PiP) events at national and regional level aimed at maximising engagement with the latest set of climate change projections.

35. The Local and Regional Adaptation Partnership Board (LRAP) has been set up to help local and regional bodies adapt. It 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 purpose of the LRAP Board is not to dictate what local and regional bodies should be doing in response to the Climate Change adaptation challenge, but to collate and share best practice around the country. LRAP uses its budget to fund research and events in partnership with other organisations. As above, Defra also funds the nine Regional Climate Change Partnerships to deliver adaptation projects and to raise awareness, build capacity and stimulate action in the regions.

36. Following the launch of UKCP09, we are rolling out a comprehensive series of events to raise awareness of the projections and show how to use them to support adaptation planning. These “Projections in Practice” events are targeting a range of different regions, sectors, organisations, and themes. The programme includes presentations, national events, regional workshops, IT training sessions, and e-learning modules. UKCIP is helping to deliver the programme and to support a greater understanding of how the latest projections can inform enhanced climate change risk assessments and a clearer focus on the need for long-term adaptation of assets and business. Further information, advice and support are available from UKCIP, through its website and a range of free training materials and e-learning modules.

How effective is the communication within and between departments; and between government, local government, business and the general public on adaptation?

The ACC Programme operates an effective Board structure, together with targeted stakeholder and working groups at all levels, through which collaborative work on adaptation is driven forward. The UKCP Projections launch in June 2009 provided an effective springboard for communications with business sectors, regional and local government, through an ongoing series of Projections in Practice events, as well as generating over 300 media articles on the launch alone.

37. The ACC Programme is bringing together and driving forward effective co-ordination across central Government. The Programme offers regular information updates for all Departments and provides more formal “governance” through structures such as the Domestic Adaptation Programme Board (the NAO briefing on climate change adaptation summarised the main governance arrangements put in place to manage the ACC Programme). The ACC Programme is also developing a small team of “relationship managers” who can continue to build knowledge and understanding of activity in different Departments,

offer support and encourage sharing of best practice, and make sure that common interests and interdependencies are being discussed and explored. A specific objective of this work is to support active and improved sharing of learning and best practice between Departments.

38. The programme has also prioritised strong communication and engagement with local government, to promote greater awareness within that sector and to capitalise on their extensive networks and contacts to reach a wider public audience. Three sets of workshops with local government have been used to develop a shared understanding and key messages. As a result of this work, new guidance has been produced by local authorities on the likely impact of climate change within local communities.

39. There will also be a strong regional element to the development of the CCRA. Individual regions will have a dedicated “chapter” in the final output. The Regional Development Agencies and Government Offices have representation on the CCRA steering group and are co-funding the research. We will need to draw heavily on existing networks, such as LRAP, to understand stakeholders and feed in existing analysis that helps constitute the regional evidence base.

40. The Climate Change Adaptation Partnership Board is an important Stakeholder group, which provides informal advice to Government on the development of the ACC Programme and on developing approaches to wider stakeholder engagement. The Group also has a role in communicating information about adaptation to wider networks and it provides a basis for organisations to work together on adaptation.

41. As part of the ACC Programme, a new “Business, Skills and Technology” project is now being developed to support the private sector in addressing the impacts of climate change on business and encourage appropriate risk management strategies that incorporate climate change impacts. This can help the private sector to plan for a changing climate adequately and to maintain its competitive position in the global economy. It will also support business by making sure it has access to the evidence and research it needs to make effective adaptation risk assessments, and is able to identify key business opportunities and technological solutions in response to a changing climate. UKCIP also works closely with businesses and other organisations to help them assess the effects of climate change, so they can prepare for its impact. UKCIP encourages organisations to use its tools and information to help them consider their climate risks and to plan to adapt.

42. The Climate Change Act, UKCP09 and the focus on the UN Climate Change Conference in Copenhagen in December 2009 have all helped to boost the level of public engagement with climate change, including the importance of effective adaptation. (The launch of the Projections alone generated over 300 media articles.) The Government’s “Directgov” website helps the public to gain ready access to information about the environment and climate change. The website stresses how individuals can help to tackle the effects of climate change by saving water and energy, and reducing their carbon footprint. However, it also explains that there are many things people can do now to protect their homes and themselves from unavoidable changes in the weather; for instance through insulation, better natural ventilation, preparing for floods and droughts, and saving water in the garden.

Should work on adaptation be embedded into existing sustainable development frameworks and, if so, how this might be achieved?

43. Adapting to climate change should involve making decisions that are sustainable, made at the right time, which maximise the benefits and minimise the costs that a changing climate presents. Sustainable adaptation aims to ensure that adaptation measures do not contribute to the causes or consequences of climate change, and that action in one place or sector does not unreasonably limit the ability of another one to successfully adapt. For our natural environment, this means avoiding damage and, wherever possible, seeking to support its adaptation. Sustainable adaptation is an essential partner to sustainable development. It will ensure that we are best placed both to minimise the threats posed by the impacts of climate change and to capitalise on potential opportunities presented by it.

44. In practice, the Government want to ensure that approaches to adaptation are integrated into existing work on sustainable development. All central Departments and their executive agencies are already required to produce Sustainable Development Action Plans (SDAPs) and to update them on a regular basis. These Plans are scrutinised by the Sustainable Development Commission (SDC), and Departments report on progress against their own SDAP targets in their annual reports and other key publications.

45. The ACC Programme will continue to work with the SDC to embed climate change adaptation within this process. SDAPs should set out a Department’s overall approach to climate change adaptation and place it in the context of sustainable development. Annual updates to SDAPs should include any new or emerging departmental priorities, and explain how these are linked to the Department’s overall vision for sustainable development. This should include those priorities emerging from the process of developing Adaptation Plans. Each Department’s SDAP will then be complemented with a more detailed adaptation plan, listing how these actions will be delivered. The SDC may also wish to play an explicit role in scrutinising Departmental Adaptation Plans.

46. It will also be important to ensure clear links with climate change mitigation work, so that this is coherent and both adaptation and mitigation are being addressed with the wider sustainable development agenda (ie social, economic, and environmental well-being) in mind.

EXAMPLES OF DEPARTMENTAL ADAPTATION ACTIONS

INTRODUCTION

1. In its briefing for the EAC on climate change adaptation, the NAO considered the wide range of risks that Departments identified to their objectives arising from the impacts of climate change. These risks were judged to 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; and
- *Public health*—risks to health and the provision of health services.

2. The NAO additionally noted that flooding and coastal erosion give rise to a number of risks that cut across these groups.

3. The rest of this annex provides examples of some of the latest Government activity, since the NAO evaluation in spring 2009, in these key areas.

BUSINESS AND THE ECONOMY

4. BIS is currently developing a strategy for raising awareness and building capacity within the business community to adapt to a changing climate. Through the Regional Development Agencies, and the Regional Climate Change Partnerships, a significant amount of business engagement has happened around the country. Guidance on how the RDAs can embed adaptation into the Single Integrated Regional Strategies is currently being developed. The RCCPs have produced a variety of research and tested pilot projects for engaging the business community. For example, the North-West published a report earlier this year—“Impacts and Responses for Key Business Sectors”—outlining which sectors are most at risk and in which specific cities and areas of the region. This highlights the importance of certain sectors, such as manufacturing, to the region and the need to ensure it is climate resilient. London Regional Climate Change Partnership has various working groups focused specifically on business engagement. For example, the Finance Group focuses on solutions around financing mechanisms for adaptation and has representation from insurance, banking, fund management, and legal sectors.

5. The Department for Culture Media and Sport (DCMS) will publish research into the long-term effects of climate change on its sectors by the end of 2009, which will assess and prioritise key climate risks. The work will look at assets and resources available within the cultural, tourism and creative sectors to enable other stakeholders and organisations to become more resilient to climate change. It will consider the financial resilience of businesses within DCMS sectors to climate change (such as sporting and visitor attractions) and how they can boost their ability to respond in cost efficient ways. The research brings together a range of evidence, including published literature, information on past extreme weather events, geographical information systems, climate change projections, and stakeholder input.

Infrastructure

6. The Highways Agency (HA) will soon publish its Adaptation Strategy, which includes methods for examining and prioritising risks from climate change, and identifying management options. Although written for the HA this can be used as good practice to stimulate wider application of adaptation. The HA has joined the European research collaboration ERA-NET Road to deliver a portfolio of climate change projects—Road Owners Getting to Grips with Climate Change. DfT and the HA are supporting and part funding road and rail projects under the Engineering and Physical Sciences Research Council’s FUTURENET project to identify risks to develop Future Resilient Transport Networks.

7. In July, DfT published Local Transport Plan Guidance to support local transport authorities develop and deliver statutory Local Transport Plans. The guidance encourages the inclusion of measures to improve the resilience of local transport to the impacts of climate change. The Guidance will promote further action on adaptation of transport infrastructure at a local level, where some real progress is already in evidence: for example, in Shropshire a river bridge susceptible to flooding has been rebuilt to withstand the expected increase in rainfall and flood risk associated with climate change. The river bed and banks have been stabilised and the bridge built with stronger reinforcements. In Worcestershire, the council has established the Worcestershire Land Drainage Partnership to focus on flood risk management and improved drainage in light of the expected increases in rainfall and extreme weather events.

8. DfT has begun utilising research from a recently published study by Rail Research UK on the impact of temperature change on the railways. DfT support and funding also helped the Technical Strategy Advisory Group for the UK Railway conclude its technology roadmap which includes adaptation. With support and funding from DfT, RSSB¹ published their Foresight Studies in Sustainable Development which identifies long-term sustainable planning options and tools for the rail industry.

9. The UK ports industry is largely private and operated without state intervention. However, DfT has used links via industry associations to promote compliance with the Climate Change Act and encourage engagement with the Climate Projections.

10. Guidance in the forthcoming DECC-led consultation on the Nuclear National Policy Statement will include the need to consider good design in applications for nuclear power station development; for instance, by assessing how the application has taken account of climate change and the need for adaptation. In particular, developers should set out how the application for nuclear power station development would be resilient to coastal erosion and increased risk from storm surge; the effects of higher temperatures, including higher temperatures of cooling water; and the increased risk of drought and a lack of available cooling water. Climate change resilience measures should form part of the relevant impact assessment in an application for development. For example, climate change impacts on cooling water from higher temperatures, or the effect of drought on direct cooling measures, would be covered in the impact assessment on water quality and resources.

11. Patterns of demand for energy could change as temperatures increase (as set out in the UK Climate Projections 2009) with an increased requirement for energy in the summer for cooling homes and workplaces—especially through the use of air conditioning. Electrical air conditioning now accounts for 4% of final electricity consumption and is predicted to rise further with higher global temperatures. Cooling demand in the service sector alone could account for 6% of final electricity consumption by 2020. In the commercial sector, cooling consumes more energy than heating, and climate change is likely to lead to even more demand for cooling both in homes and workplaces. DECC is working with National Grid on their long-term planning on the increased need for cooling in the UK. DECC will also consider these issues in respect of energy efficiency policy, going forward.

12. The resilience of the energy sector and its infrastructure to the changing climate will be of increasing importance in future. 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 less effective, leading to higher generation constraint costs and possibly equipment failure. 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. The electricity industry has developed a methodology for identifying those substation sites that have a large impact on customer supplies and are at risk of flooding. This methodology will now be used to determine what flood defences are appropriate and create a plan for building them.

AGRICULTURE, FOOD SECURITY AND THE NATURAL ENVIRONMENT

13. The UK will need to change the way food is produced and processed so that we continue to enjoy healthy affordable food in the decades ahead. The UK's first food security assessment, published in August 2009, shows that the country is doing well in many areas which make up a secure and sustainable food system, such as a diverse food supply, which includes UK production, and a strong distribution system. The challenges will be to ensure the sustainability of the UK's food supply. In particular, we will need to reduce greenhouse gas emissions and to adapt to a changing climate here and overseas that will affect what food can be grown and where and how it can be grown. Defra published the UK Food Security Assessment on 10 August, alongside "Food 2030"—an online discussion seeking views on the future of our food system.

14. Following last year's announcement by the Secretary of State, NERC and the Devolved Administrations have now joined Defra in undertaking a UK-wide National Ecosystem Assessment. It will assess how the terrestrial, freshwater and marine ecosystems across the whole of the UK have changed in the past and how they might continue to change in the future as temperatures rise and patterns of rainfall alter. The Assessment will create a compelling and coherent narrative on the state and value of the natural environment and ecosystem services, will assess policy and management options to ensure their integrity in future, and will help raise awareness of their importance to human well-being and economic prosperity.

¹ RSSB is a not-for-profit company, owned by major industry stakeholders, that works on strategic safety and standards in the railway industry.

HOMES AND BUILDINGS

15. CLG has launched a consultation (issued July 2009) on proposed new *Development and Coastal Change* policy. This aims to support Defra's draft Coastal Change Policy (see Flooding and Coastal Erosion section) by providing the planning tools that will be needed to help coastal communities adapt. The policy promotes a strategic risk-based approach to managing future physical changes to the coastline, so that long-term adaptation of communities can be planned whilst allowing necessary development that is appropriate and safe. The consultation on CLG's proposed new planning policy closes on 12 October 2009. CLG aims to publish the final policy in early 2010.

16. The Government's spatial planning policies on development and flood risk as set out in Planning Policy Statement 25 (PPS25) provide a risk-based approach to managing future changes in flood risk to and from new development due to climate change. CLG has carried out an initial review of how well PPS25 is being implemented by local planning authorities and found that good progress is being made overall. CLG is encouraging planning authorities to make further progress in applying the PPS25 approach, and is working closely with Defra in taking forward wider work on improved management of flood risk in the context of the draft Flood and Water Management Bill.

17. HM Prison Service (HMPS) has held events jointly with Strategic Alliance construction partners to present the effects of climate change and raise the challenges posed with them. They have now begun to respond on specific new projects. Design requirements for new prisons require that they are capable of withstanding not only 1:100 year catastrophic events, but also the annual extremes predicted as a result of climate change. Particular solutions being proposed are to raise the foundations, to raise the entrance level into secure areas, provide gravity and pumped solutions to take away flood water, increase attenuation where possible by passive means such as swales and tanks, more effective natural ventilation, solar shading, increasing building mass, heat pumps, and building orientation. Wider implications of climate change for new build projects are also being factored into the choice of site and the design; for instance, 24/7 access to the prison, and the feasibility of evacuating an entire prison population if the area surrounding a prison is flooded and the prison is entirely cut off.

18. HMPS are revising the sustainability Core Requirements for new construction projects to incorporate the potential impacts of the new climate change projections. Technical assessors on building projects are being asked specifically to ensure that the issues surrounding climate change are fully addressed by the constructor at the design stage. Building management is moving to more low energy fittings which generate less heat and should to a limited extent offset the impact of higher mean temperatures.

19. The Ministry of Defence (MOD) is developing a Climate Impacts Risk Assessment Method (CIRAM) that will help MOD sites to identify and evaluate the significance of the risks from a changing climate or extreme weather events to the resilience of their built estate and operational capacity. The risk method encourages a wide review of potential risks including critical assets, health and safety, local community and off site and business continuity issues. CIRAM will enable sites to incorporate the risks into future site planning and maintenance. Location and design of new buildings or major refurbishments can also be amended to incorporate climate risks into siting and design features. As part of the methodology the UKCP09 scenarios are explored on a site by site basis to aid understanding of the significance of the risks. The method has recently been trialled at the headquarters for equipment procurement in Bristol, and on a Royal Marines base. There are plans in place for future trials and roll-out to MOD core operations sites.

PUBLIC HEALTH

20. The potential impacts of climate change on human health are multiple and diverse (and not all negative). Hotter drier summers, milder wetter winters, and more frequent extreme weather events such as flooding and heatwaves, as described in UKCP09, could mean a decrease in cold-related winter deaths and an increase in heat-related summer deaths; an increase in cases of food poisoning and vector-borne diseases; and increased cases of sunburn and skin cancer as people spend more time outdoors.

21. One of our priorities is to ensure that national and local adaptation plans exist for the expected health impacts from climate change, such as the National Heatwave Plan, and to ensure that plans are fully implemented with regular evaluation. The Heatwave plan was triggered at the end of June 2009, including media messages and specific actions for health professionals to help protect vulnerable people from the effects of heat. The Health Protection Agency is conducting an evaluation of excess deaths and hospital admissions that will be reviewed in the New Year to inform and improve next year's heatwave plan.

22. A Health Technical Memorandum (HTM) under the Environment and sustainability section entitled HTM 07-07 "Sustainable health and social care buildings" was made available in the early part of 2009. This document discusses the implications of sustainable development on health and climate change impacts. It helps to define the roles and responsibilities of the NHS and gives detailed advice on the issues to be considered.

FLOODING AND COASTAL EROSION

23. The latest UK climate projections (UKCP09) confirm that climate change will continue to increase risks from flooding, including surface water, and coastal erosion through projected sea level rise and increases in the intensity, severity and frequency of storms and rainfall events. Defra has been leading action to tackle these risks. In April, the Government published a draft Flood and Water Management Bill, designed to renew our national approach to flood and coastal erosion risk management, responding both to the recommendations of the Pitt Review and the need to adapt to climate change. Defra is currently analysing the responses to the consultation, which ended in July, and the pre-legislative scrutiny report from the Environment, Food and Rural Affairs (EFRA) Select Committee.

24. Recent work has focused on protecting households and communities from flood risk. In June, the first round of new grants to help people protect their homes against flooding was announced. Local authorities were able to bid for a share of £5 million property-level grant scheme. They will be given flexibility in how they implement their schemes and the initial surveys they commission will ensure they know exactly how best to allocate the funding available. A second round is planned for the autumn. In August, Defra further announced that local communities across England would benefit from £16 million funding to help them tackle surface water flooding. This will include £9.7 million for 77 local authorities in areas where the evidence shows that the risk and potential impact of surface water flooding could be highest.

25. Defra is also working to improve flood risk management capacity. Over the summer contracts totalling £1 million were issued and work began on 3 projects which seek to reduce the risk of flooding through exploring land management techniques which work with natural processes and also seek to achieve multiple objectives like carbon sequestration. The Department is also spending £1 million on making training, data and other tools available to help all local authorities manage flood risk. In June, Hilary Benn announced additional investment in improving local capacity, funding up to 27 apprenticeship places on a foundation degree starting this autumn, and Defra published a new policy statement on the appraisal of flood and coastal erosion risk management, which contains guidance for operating authorities and others involved in ensuring the right decisions are made when considering projects, and value for money is achieved.

26. In the same month, the Environment Agency updated its publicly available on-line flood risk maps; published *Investing for the future—a long-term investment strategy*, looking at funding needs and benefits over the next 25 years; published *Flooding in England: A National Assessment of Flood Risk*; and also introduced a new *External Contributions Policy*. This policy aims to encourage businesses and communities routinely to make financial contributions towards the costs of flood risk projects that will benefit them, in order to make public investment go further and achieve more overall.

27. Defra also announced in June 2009 an £11 million pathfinder programme to enable coastal local authorities to test drive innovative approaches to coastal change adaptation. The announcement of the pathfinder programme coincided with the launch of a consultation on new Coastal Change Policy to examine what managing coastal change could look like for individuals, businesses, local infrastructure and the historic and natural environment. The consultation package sets out ideas on approaches and engagement guidance for supporting local communities at risk from coastal change in planning for and managing change. It also includes proposals for a new coastal erosion assistance package to help those who lose a property as a result of coastal erosion with demolition and moving costs.

28. The EA is also continuing to expand its Floodline Warnings Direct service, which provides flood warnings direct to householders and business by telephone, mobile, email, SMS text message, fax or pager. Most recently, work has focused on engagement with telecommunications companies to develop a system that automatically registers ex-directory landlines in targeted areas at high risk from river and coastal flooding. We expect to be able to warn these people by the end of December 2009.

8 October 2009

Witnesses: **Rt Hon Hilary Benn MP**, Secretary of State for Environment, Food and Rural Affairs, **Professor Robert Watson**, Chief Scientific Adviser and **Mr Robin Mortimer**, Director, Adapting to Climate Change Programme, Department for Environment, Food and Rural Affairs, gave evidence.

Q267 Chairman: Thank you very much for your time this afternoon; it is much appreciated. There is a great deal of interest in our inquiry into this subject which we have just agreed with Lord Krebs has perhaps, relative to mitigation, not received quite as much attention as undoubtedly it needs and deserves. May I ask you to start with just how big an impact you think climate change has on government? Does it actually change the objectives of individual departments and how those are going to have to be delivered?

Hilary Benn: First of all, good afternoon. May I say how much I welcome the Committee's inquiry? The truth is that trying to stop climate change getting worse has for very understandable reasons received a great deal of attention and learning to live with the climate change which is coming anyway has not, although I think that is beginning to change, both because of the adaptation provisions of the Climate Change Act and the framework that has been put in place, and that is a great aid. I know, having read the evidence sessions you have had in the inquiry, that

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there has been a lot of discussion about process. I simply observe that if it is process for a purpose, then it is a good thing because it helps to answer your question “Does everybody get it?” in understanding the importance of adapting to climate change. We have in a sense been at it for two years, we are trying to concentrate on the things which are most important. It is beginning to change and certainly within the Department I think we saw the publication of the UK Climate Impact Projections last summer as an opportunity to tell the story on the back of what the projections had to say about what may be coming, about what people need to do to think about how they are going to adapt to those changes when they arrive. Although it is not quite what people would anticipate, if you think of the recent spell of severe weather we have had, well there is a classic example of trying to adapt to circumstances that we have not seen for a little while because we have had a run of pretty mild winters. In summary, it is having an impact, but we are learning and that goes for everyone inside government and outside and we are trying to put the right building blocks in place. I hope you will be encouraged as a committee by the progress that we have made, recognising that there is a lot more to do.

Q268 Chairman: It is clearly, as indeed is mitigation, a very cross-cutting issue. Do you think that other departments in Whitehall accept the importance and the urgency of action on adaptation quite as well as Defra does?

Hilary Benn: Yes, but the real proof will be with the publication of the Departmental Adaptation Plans when they come out next month. They are going to be published and everybody can see. Let us take a couple of very practical examples. The experience of the 2003 heat wave in Europe, which killed 25,000 people, led the Department of Health to say “We need to have a heat-wave plan” and they now have one. There is a really practical example of adaptation. One of the tasks for all of us have who care about this is to explain what we are on about and I have tried very hard generally not to talk about adaptation and mitigation because not everybody understands what we are on about. This is why I talk about stopping it getting worse and learning to live with the climate change which is coming our way anyway. Another very practical example would be the Highways Agency. They do three things: one is in the design specification for new roads to have bigger drains, really useful for taking surface water runoff in intense rainfall; by the way it is also quite handy when the snow melts for dealing with the water which runs off. First example. Second example: crossovers. If you look at the pictures of the M50 in the summer rain of 2007 you had a whole lot of traffic backed up because the road was flooded. The other side of the carriageway was not flooded but the cars could not turn around because there were no crossovers. Highways Agency are now thinking about whether they can put crossovers in the systems; another very practical example of adaptation. The third thing they have done is to change the specification for road surfaces, learning

from the south of France for example, because if you are going to have hotter summers that can do something to road surfaces if it gets very hot. So there is one part of government which I would say is already demonstrating that it has got it, but that is not happening everywhere. It seems to me that the first stage is about awareness, that people understand what you are on about and obviously you would find people will get it a lot more in places which have experienced extremes of weather. Boscastle is a really good example because, in the wake of what happened to them not all that long ago, they have raised the level of the car park by one metre and moved it away from the river and they have built a new bridge lower down which is higher and out of the way to allow more of the water to pass. Thirdly, they have built a culvert to act as some relief if they get intense rainfall. There is a very practical response because they understand in the way that Workington will now understand. Having peered at the footings of the Carver Bridge and seen how they were undermined by the torrent of water that came down that evening, when it comes to a new permanent bridge getting built there, that is one of the factors they are going to have to take into account.

Q269 Chairman: You quoted some good examples of where departments have reacted: Department of Health has a heat-wave strategy, Transport are looking at crossovers on motorways. Reaction is better than not reacting but anticipation would be even better. Let me ask about the Home Office for example. It is quite possible that by the end of the century we might have to have several million immigrants who have been forced out of their homes in other parts of the world, whose connection with this country may be somewhat historic. Has the Home Office developed a strategy to adapt its immigration policies, which clearly do not envisage immigration on this sort of scale, to take account of this aspect of adaptation?

Hilary Benn: There is a Foresight study which is trying to look slightly further ahead. It depends what assumptions you make about the extent to which climate change will force human beings to move around the earth to find somewhere where they can live because they cannot live where they were previously. We can all think of lots of examples. By and large the evidence is that people will move to the nearest place to where they were living. Take the example of Afghanistan, it was not the climate but it was conflict, but some people came to seek asylum here; the vast majority of people who left Afghanistan, about four million, went either to Pakistan or to Iran. If sea levels rise in the ways some scientists forecast, a lot of Bangladesh is moving house and probably they are going to move next door to India. It depends what assumptions you make but one of the ways in which we will see how that question is being answered or not is when the Departmental Adaptation Plans are themselves published and the purpose of publishing them is precisely so they can be open to that degree of scrutiny.

Professor Watson: I do not know whether they have any plans but Paul Wiles, the Home Office Chief Scientific Adviser, and I went to a World Bank meeting about a year ago to look at what the evidence was of the implications of climate change on hunger, on human health, on displacement of people and to try to gain some understanding of what degree climate change would lead to environmental refugees. Clearly what we learned was that it was very dependent on the socio-economic and political structure of those individual countries as to what degree they could cope with climate change. Paul has also commissioned some additional research on the issue. They are certainly looking at it as an issue. To what degree any of the results have influenced an adaptation strategy I really do not know.

Q270 Chairman: Is the cross-Whitehall programme board strong enough? Is that going to be effective?

Mr Mortimer: I chair it. It is really important to say that it is ambitious in the sense that we have 16 departments around the table. We are trying to be incredibly comprehensive. We are getting very good engagement and one of the things that has changed is that there had been a step change in the last two years. There has been, from permanent secretaries down, a sense in which adaptation is now seen as a priority alongside mitigation and that will bear fruit in the adaptation strategy. It is attempting to be incredibly comprehensive and not just to look at individual departments but also to look at the linkages. For example, we are doing a cross-cutting piece of work looking at national infrastructure with CLG, DfT and DECC in particular and trying to understand how some of the impacts on one part of the national infrastructure will affect others and so on. In both those senses it is attempting to be comprehensive.

Q271 Chairman: Is Defra better able to drive this forward than, say, the Cabinet Office?

Hilary Benn: I think we are doing a pretty good job to be honest. You could sit the function anywhere you like in government. We have a range of things we obviously have direct interest in which are big for adaptation: food, farming, flooding, biodiversity, marine and so on. In my view there is a good structure in place. What was in the Climate Change Act gives us the information, puts duties upon us as a government to make sure we have thought about what the risks are and what the plan is for dealing with them. As I said, I think we are making reasonable progress. Certainly to judge by the number of people who come from other countries to Britain to ask what we are up to, a fair assessment would recognise that we are ahead of most other people. That is not to say we cannot do better and more but one has to acknowledge that a lot of other countries have not even got to where we are and perhaps that is not surprising for the Climate Change Act is the first of its kind in the world.

Mr Mortimer: We do have very close links, particularly with the resilience part of the Cabinet Office who sit on our programme board and vice-versa. Essentially, they are taking a five-year forward look at immediate risks, particularly to critical national infrastructure, whereas obviously we take the very much longer-term view. Making the connection between the short term and the long term is why we are trying to join up.

Q272 Mr Chaytor: Just coming back to the Departmental Action Plans which will be published this year. Last year the National Audit Office produced a survey of the state of play. Did your inter-departmental board consider that NAO publication? If so, how did you respond to it because the variation between departmental achievements was pretty striking?

Mr Mortimer: Absolutely. The NAO Report was incredibly helpful in terms of pushing us towards the concept of producing departmental adaptation plans to try to get that greater level of consistency. There is a wide recognition around the programme board that departments are at different stages; organisations like Defra, like CLG, like DfT have been looking at this for longer, others are coming to it fairly fresh. Yes, it was a very useful piece of work from that point of view.

Q273 Mr Chaytor: Last year's Green Book introduced this new advice on accounting for climate change impacts.⁶ What has been the effect of that on the work of individual departments?

Hilary Benn: It is a very interesting question. I am told it has been downloaded 12,000 times, so someone is having a look at it. As you know, it was published in June last year. It recommends that the standard discount rate is used for adaptation. It is getting people to begin to think about how we work this into decisions that we take about investment. It is not straightforward. I was much struck by what Helen Phillips had to say to you in answering a question about this when she said that they did a lot of work and they peer reviewed it and in the end came to the conclusion that it was fairer to describe these as case studies because it is quite difficult to say "Here are the rules that everybody should apply in trying to take adaptation into account in economic decisions". The economist group is looking at how sustainability can be taken account of in decisions. Anyone who is taking decisions must take account of climate change. There is the really tricky question of, in the jargon, inter-generational equity: what do we do now to avoid cost falling on others later? How the conversation will go when people actually looked at projects and what the cost is going to be. If it is a case of designing slightly differently and therefore it is not necessarily more expensive—a slightly bigger pipe, going back to my Highways Agency example—we are not talking about an enormous cost, then we have a much better chance

⁶ HM Treasury, *The Green Book: Appraisal and Evaluation in Central Government* (and Supplementary Guidance)

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of making progress. The other thing you need is the right skills in terms of design and building. Having gone to RIBA⁷ to give a presentation a few months back on the projections and adaptation, talking to some of their folk beforehand, there are bits of that profession that have got it, they are building it—no pun intended—into what they are designing currently, and then others who have not. It is about raising awareness all the way across the piece. This was a step forward in publishing the supplementary guidance to get people thinking about it and give them some advice on how they ought to take it into account.

Q274 Colin Challen: Looking very briefly at the Climate Change Act and the things we hope we are going to do in terms of mitigation, it has been suggested that the Government tend to have an optimism bias. If you have a range of values which science says at one end or the other, depending on various probabilities, you may achieve this outcome, we tend to go to the lower end. We have a very low expectation of getting more than a 50:50 chance of keeping temperatures in 2°C. Is there any kind of optimism bias in our adaptation plans? Earlier on I was asking about the estimates of temperature increase that would form part of any assessment that is done. I do not think our previous witnesses were in any way trying to deflect the question. They did provide an answer of somewhere between 2.5°C and 4°C by the end of the century. How should we pitch our adaptation plans? Not at the bottom of the level of expectation surely, but we could get away with that if we wished to.

Hilary Benn: There are several points there. The first thing to acknowledge is that the UKCP09 projections⁸ were of course new and better because for the first time they gave an indication of probability. That is a big step forward. When does probability matter? An example I give is if you are a manufacturer of sun hats and someone says it is going to get warmer and it may be 2°C, 3°C or 4°C, that is probably just about all you need to know to anticipate. If you are responsible for the Thames Barrier, which is protecting the building we are sitting in today, then you are really, really interested in the 10% probability of the highest sea level rise. The best assessment we have on the Thames Barrier for the moment is that it is good to 2070; it depends what happens thereafter. That is the first point. The second is, as the projection showed very clearly, the next 20, 25, maybe 30 years are all of the lines—because we took, from memory, some of the projection scenarios for global emissions and they are roughly moving in the same direction. There is not a huge amount of difference because we are dealing with what is already out there and therefore the impact it is going to have on climate change. What then spreads them apart in the graph is what we do from here on in when it comes to mitigation. Part of the purpose of projections is obviously to raise people's awareness, to get them thinking about this. Each organisation, whether it is government,

business, local authorities, has to look at what that says about what might happen and then say “Well, if that did happen, depending on the outcome, whether it is 4°C or lower or higher, then how might that affect me and my organisation and the things I have responsibility for and therefore what do we need to do in case that comes to pass. One of the other things the projections of course do is reinforce the argument for making sure we do not get to those kinds of temperature increases that the medium-emission scenario indicated we could get to by the 2080s, if we do not get a decent global agreement. We made a bit of progress but not as much we hoped we would in Copenhagen. The final point you raise in your very important question is how we deal with the uncertainty. If people say “Look, just tell us what it is going to be”, we cannot tell people what it is going to be, but we can give them our best assessment—and that is what UKCIP does—of what the range is.

Professor Watson: In addition to that, the question is: what are we going to try to adapt to? It is dependent on a mission scenario and our knowledge of the climate system now up until about the mid-2030s. The climate of the mid-2030s is already preordained due to the emissions in the past. It is only past the 2030s that the results of the Copenhagen agreement would matter. We have been doing a lot of work on the limits of adaptation. There are economic limits, financial limits, technological limits and behavioural limits. Whenever you look at a particular sector you have to ask to what degree we have to adapt, what technologies could we potentially use, what policies would need to be put in place and what behaviours do we have to change. So, for example, in the food system we have to ask how we can get more drought-, temperature-, salinity- and pest-resistant crops. Can we do it with just genomics and classical plant breeding? Do we have to use genomics with genetic modifications? How will the consumer behave? How will the farmer behave? One is trying to take a very integrated approach sector by sector and recognising the linkages clearly from one sector to another; so water and agriculture and the way we use our land are totally interlinked. You do have to ask to what degree you can adapt and then look at all the various aspects. That is what we are trying to do. That is why the National Risk Assessment and the National Adaptation Strategy will be absolutely vital.

Q275 Colin Challen: How will this issue of probabilities play out in your negotiations with the Treasury? The obvious approach is to say you have all these assessments and you will go with the central estimate; that would seem to be the obvious thing to do. They are going to say we are living in an exceptional period of austerity, all the parties are signing up to what some people describe as savage cuts and others are far more gentle in their approach to this, but, all the same, it is a huge constraint. The Treasury are going to come back to you and say “Sorry, but we are going to go for one of these

⁷ Royal Institute of British Architects

⁸ UK climate projections

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cheaper estimates, still within the range of probabilities” and therefore you get this optimism bias being forced back into it.

Hilary Benn: It is a very pertinent question. I give you one example of where government already responded and that is expenditure on flood defence. I came into this job on 27 June 2007 and I inherited—it was not down to me—an increase in the flood budget over the next three years. This Government had already looked at what was happening and said more needed to be spent on this as part of the CSR.⁹ So the fact was that we had been able to protect more homes over this three-year period as a result of that decision having been taken long before the 2009 projections were produced because people could see what was happening anyway. That is the first thing.

Q276 Colin Challen: That CSR was agreed before the recession.

Hilary Benn: That is true. I asked the Environment Agency to do an assessment of what we are going to need to do in the years ahead. They came back and said that flood defence spending was going to need to rise—from memory—about £20 million a year or so each year just to keep pace; if we wanted to keep the level of protection where it was, that would be what we were going to need to do. Secondly, of course in normal times let alone when money is tight people will be asking whether we really need to do this now. One of the arguments which has to be put is that we may be saving a bit of money now but what is the cost that we may be looking at later on? If you look at what Nick Stern was able to do through that extraordinary report of his on the economics of climate change, he turned the argument, certainly within the business community.¹⁰ Frankly, if you are able to demonstrate to people the cost of dealing with this problem is going to be this and the cost of not dealing with it is going to be this and ask them which they fancy, lots of people, not surprisingly say they would go with the lower option, thank you very much. It is slightly more complicated in the case of adaptation, for the reasons of the uncertainty that you allude to in putting the question, dealing with the range of probabilities and whether this has come to pass. I can give you a very practical current example. If you had been a local authority officer who had gone to your council three years ago and said you would like to build a whole new dome to store double the amount of salt, you might have got the answer from the councillors “Hang on a minute, we’ve had 23 years of really mild winters, why do we need to do that now?” The debate we had after February last year, which led to the Lugg report in the summer which said actually you ought to up your supplies to cover a certain number of days, is a really good example because we saw what the consequence of not doing it was, therefore we are more inclined to take action than when it was what might be perceived as a theoretical possibility that may not come to pass for a number of years.

Q277 Colin Challen: One way of tackling it could be to change the discount rate again. It was lowered in the Green Book but it is still fairly high. Obviously we want to help future generations but that is by doing things now and not having any particular rule preventing us from doing it. Why not reduce the discount rate again so that we are not front-loading the costs so much?

Hilary Benn: The guidance which came out in the summer, as I understand it, did take the Stern view, in relation to what is described as significant and irreversible impacts on future generations, to use in fact a lower discount rate which is still positive. I am told that it is called the zero rate of pure time reference. I will not pretend to the Committee that I understand what that means but basically it is a slightly lower discount rate—I think that is the case—and that has been contained in the guidance. We are going to have to reflect on this as things unfold. It is no use pretending there is not going to be some wrestling going on about this because of current economic circumstances. That is why a really important point in all of this is trying not to see this as something extra, because the climate has always adapted, that is the story of human beings’ existence on the earth, but we have to build this into what people think about as the norm. That is why it is about understanding awareness and skills, rather than this being something extra we are going to have to do, and helping people to see what the consequence is. There are some very good examples where people have got that already. It is easier in some areas frankly than it is in others is the straight answer I give.

*The Committee suspended from
3.51pm to 3.59pm for a division in the House.*

Q278 Martin Horwood: A quick supplementary on the flood management budget, just because that is a good example of adaptation spending but also one which is obviously under your control. We have seen some shifting backwards and forwards in the total sums in response to the stimulus package. Is there not going to be huge pressure in the hangover from stimulus spending, when we are having to make public spending cuts generally, to see that spending would be presented as a temporary cutback in flood risk spending? If you look forward over the next three or four years could you confidently predict that those increases in flood risk spending will be maintained?

Hilary Benn: Those of course are always matters for the Chancellor and the CSR. I am on record publicly as saying that we are going to need to spend more on flood defence for reasons I think the Committee is only too well aware of. The question is where the funding comes from. At the moment it comes from central government, but increasingly it will be a question for communities too because obviously a lot of authorities have a wellbeing power, and involve some very difficult choices, particularly for dealing with coastal erosion, which is very tough indeed. One of the ways in which we are trying to encourage adaptation to that change is the coastal

⁹ Comprehensive Spending Review

¹⁰ HM Treasury, *Stern Review on the Economics of Climate Change*, October 2006

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pathfinder programme that we announced a little while ago which was very practically giving money to local communities that bid to be thinking through how they deal with the consequences of that for their local economy and so on and so forth. We have seen the benefit of that increased investment and the changing climate and rising sea level in my view mean we are going to have to do more. The question we have to address is how we raise the money. I am not anticipating the CSR because that is in the hands of others and not me.

Q279 Mr Chaytor: Pursuing the question of costs, we have touched on the short term, the long term, the inter-generational aspect. You have touched now on the split between central and local but how do you build up a broader base of public support for the need for this? The public at election time will support spending on their children's schools, their healthcare system and their local police force but will reluctantly support spending on other things. How do we change that culture and lift climate change to the level of schools, healthcare and policing?

Hilary Benn: Let us take schools as a really practical example. If we are going to have hotter summers with higher temperatures for more days—and some of the scenarios in UKCP09 suggest that is the case—how are we going to keep those schools cool? What does it tell us about design? Shutters. Think of hot countries. They are much more likely to have shutters on windows than countries which are not quite so hot. What kind of ventilation system are you going to put in? There are some examples of schools which are already being designed taking account of that. The time to have that conversation is really with architects and those who are putting together the specification for the schools. Obviously in some other countries the school day operates to a different timetable to take account of the weather. These are things we may or may not have to address, depending on the nature of the change and, crucially depending on what we do to mitigate the change in the climate domestically through the Climate Change Act but, crucially, on what agreement we can get internationally because this is very much a shared problem. I would simply observe that the more we can enable each other to think about these kinds of consequences and people to see that there is a problem here that we need to deal with or to adapt to or learn to live with or take advantage, of the better chance it seems to me that we have of making progress. There are some things, if you think of the kind of crops we can grow with the change in climate, that will enable farmers to grow some things you cannot grow currently or extend the growing season. There are some opportunities as well as some quite serious risks.

Q280 Mr Chaytor: Coming back to the question of schools, was the time to have that discussion not more than six years ago when the Government decided to launch the Building Schools for the Future programme? We now have the largest investment in building new schools or refurbishing

schools but, in the early years, very little consideration of the design consequences of the climate change policy.

Hilary Benn: The straight truth is that we are, as a world and as a society and as a country, coming to terms with these consequences. We are ahead of a lot of other countries because of the framework we have in place but this is a process and sure, at some point in the future, given what we know now, go back, would we have done some things differently? Fair point, but it takes time to raise this awareness and get people to think about these things and the great benefit of the Act and the framework is that we have a very clear process for encouraging all of us to do this and that does represent a step forward.

Professor Watson: To be quite honest, the world's community spent way too much time only thinking about mitigation—absolutely critical obviously—and not enough thinking about adaptation. It has only been in the last three to four years that I would say the adaptation issue has become a major issue politically through the negotiations post Kyoto/Copenhagen, et cetera. Until then, even though the Inter-governmental Panel on Climate Change had almost an equal stress on the evidence that was required there, adaptation and mitigation, the international community has predominantly focused only on mitigation. Clearly what we need to do is understand the implications of acting and not acting. What are the implications for floods that would resonate with people? What are the implications for coastal erosion? What are the implications for food security? What are the implications for human health? We have to make these issues totally relevant to the public at large so that when we think about these issues they will understand why we need to integrate considerations of adapting to climate change in all development portfolios, so that when we are thinking about our roads, we understand why we do need to consider it, thinking about food security, why we do need to consider it. We need to educate the public.

Q281 Mr Chaytor: All over the country now we have new schools, new clinics, new hospitals, new police stations, the vast majority of which were designed more than three years ago. So my question is: what is your assessment of the current state of the dialogue between climate change planners and architects and the construction industry? Is there not here an absolutely central role for government?

Hilary Benn: Yes, there is and that is why we have had this programme on the back of UKCP09 taking the projections out because this has been the best opportunity we have had to get to a wider audience and say this is what may be coming now and ask what they think that means for them; thus the roadshows and the things that people can download from websites. I attended one roadshow which was in Leeds and there was a reasonable representation from the different public authorities in the area. We would have liked to see more people from industry because it is an issue for them too as well as for the Government and in some cases those buildings may themselves need to be adapted in time, even though

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they have only relatively recently been built. I would just give a couple of other examples. A very simple change that we made in the wake of the 2007 floods was to change planning permission for concreting, paving and tarmacking over your front garden. It did not require planning permission before to do that. You do now because if you use permeable paving that is fine but if it does not go down into the soil in your garden it goes into the road, you get surface water flooding and that was a big issue in Sheffield and Hull. Really small practical change that we have made as a result of what we learned. Building regulations. You have the code for sustainable homes which is voluntary but gives a signal to the industry and those who are designing “Hey, this is the direction in which we are moving”. You are then following up with tightening up on the building regulations and gradually the standard is raised. A really good example of that would be water usage. Although we have had three really wet summers, they were preceded in the south-east by two really dry summers that you could almost describe as a drought and we were fairly close to standpipes in some streets because of the weather. That is not very long ago. We are going to have to use water much, much more effectively, particularly in the south-east of the country.

Q282 Mr Chaytor: May I digress a moment and respond to a point you made there about permeable surfaces? One of the country’s leading manufacturers of permeable surfaces has a base in my constituency and is extremely concerned; welcomes the change of policy but is extremely concerned about the weak enforcement by local planning authorities. I wonder whether you have an observation on this and whether you have discussed this with your colleague, the Secretary of State for CLG.

Hilary Benn: I have not, but since you raised it I will.

Q283 Mr Chaytor: I am very grateful. We have talked about public funds so far. May I talk about private funds? You have been very good on giving concrete examples of adaptation. Do you have concrete examples of some interesting means by which private funding can be brought in to support the financing of adaptation?

Hilary Benn: In what way are you particularly thinking about private funding?

Q284 Mr Chaytor: For example, what about the role of developers and planning permissions and conditions on planning permissions and section whatever agreements?

Hilary Benn: Going back to the floods and the Water Management Bill, the provisions there relating to sustainable urban drainage are good examples of us setting a standard in the Bill—which I hope will be on the statute book before the election. It is really important that we collectively get it through, given the support there is right across the House, which will then impact on those who are developing housing estates. Clearly, if you can find a way of managing the water and the run-off that does not

involve it getting into the surface water run-off, then you are helping to minimise what otherwise would be the impact of surface water flooding. We really have learned from the events of 2007, particularly in relation to surface water flooding where we now have clarity in the Bill as to whose responsibility it is: the upper tier local authority. In the past you had the council responsible for its bit, you had private culverts, you had the Highways Agency and no-one was looking and saying if we have paved, tarmacked and concreted over most of our town and city and it rains in huge quantities where do you think the water is going to go? You are dealing with an infrastructure that dates from a different age and there has been a lot of development. There is a really good story about practical adaptation that we have now built in to the legislation that is going through Parliament and we have given some funding to a number of authorities to start piloting how they are going to pull everybody together and think through the consequences of this. The sustainable urban drainage is another example, because it shows we have it but we do not want to add to the problem with stuff which is going to be built from here on in.

Mr Mortimer: A slightly separate angle to that. It does not cover the entire public sector but would be for the statutory undertakers, the regulated sector, where, because of the power under the Climate Change Act to require statutory undertakers to assess their risk and produce action plans, we have consulted a number of bodies, the energy companies, water companies and so on, being captured by that and that would be a very direct way in which we would be looking to leverage part of the private sector to invest in adapting.

Hilary Benn: May I just add on that very point that I know that, if we take Ofwat as an example, they have a climate change team and I think they were praised in evidence to the Committee in a previous session and of course Ofwat will be directed to report on what it intends to do to adapt its regulatory system. I would just say that I think the time has come, certainly now our PR09¹¹ is out of the way, to ask whether the current regulatory framework relating to water sufficiently takes account of climate change adaptation and other things like affordability.

Q285 Chairman: Do you think where private developers are involved in proposals which might have some impact on the adaptation strategy of a particular community that their obligations are sufficiently clear and the onus is on them to make sure that they are not making things worse or if they might make things worse that appropriate offsetting action is taken?

Hilary Benn: That is a very difficult question to answer. It is why I mentioned a moment ago that we would certainly like to see more representatives of industry in these regional roadshows that we have been running. The big companies that are clued up will of course be thinking about the impact of a changing climate on what they do and their supply

¹¹ Periodic Review of Water Price Limits 2009

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chains. I have been talking to some of the supermarkets, for example, and they are thinking very clearly about this as far as the future is concerned and they have very good plans in place for ensuring the continuity of their supply chains depending on a range of things that might happen. One of the ways in which we signal it is indeed through the building regulations and that is a debate about the rate at which you crank them up. We have further to go to get a better understanding of how industry is responding to all of this.

Mr Mortimer: On the building regulations and the question about whether they are onerous enough, part of the issue there is whether we can be clear enough on what the specifications would be. If we take an issue like thermal mass of buildings, we are working hard with CLG and the Building Research people to look at what might be an appropriate standard but as yet there is not sufficient consistency of view on that to apply a universal standard across the building sector. We would look to use something like the code for sustainable homes, the voluntary approach into that through the experience of builders working with the code, then look potentially at a later date at building regulations. It is not always absolutely clear universally what has to be done. We are learning through mechanisms like that.

Q286 Martin Horwood: May I talk a little about the risk management approach that you have been talking about. Clearly Defra has done a huge amount on the flooding damage and on the Floods Bill and that is an area you know very well and which has percolated down into things like the Floods Bill and the EA. However, other departments may not have done quite as much thinking about this. If we look at the NHS or the Department for Transport and things like that, do you think they have any understanding of the kind of risks they are prepared to tolerate, the level of disruption to rail services or levels of mortality from novel diseases or from heat waves and things like that? Is that kind of risk management approach you are talking about actually present in the other departments yet?

Hilary Benn: I think the fact that the National Health Service has a national heat-wave plan is a really good example of the NHS having looked at what happened in 2003 and responded. The examples I gave about the Highways Agency obviously comes within the purview of the Department for Transport and it is another very good example of people who are getting on with it already because they can see the consequence, have experienced it and have responded accordingly. In other words, the need to adapt has become immediate and real and we see that in what they have done. As I indicated earlier, we will get a full view and people can make a judgement when the plans get published in March.

Q287 Martin Horwood: The UK Climate Impact Programme has actually quoted that example of the heat-wave plan and, if you will forgive the slightly grim quote, they said the heat-wave plan lacks a

political statement about the acceptable death rate for old people in a heat wave or about the acceptable level of risk of such deaths. This means that adapters at many levels cannot determine how much adaptation is required. Effectively, without a value for such a death, it is impossible to allocate the “correct” amount of resource which should be put into avoiding such deaths. That is something the NHS does in other respects like quality adjusted life years. Although it sounds a bit grim to us, it is actually a methodology they are not unfamiliar with but it does not seem to have been applied to adaptation, does it?

Hilary Benn: My reaction is that I do not quite see how you could attempt to quantify it in the way you suggest, to be honest.

Q288 Martin Horwood: It is actually the way, although it is grim, that they do for quality adjusted life years in determining cost effectiveness of drug treatments. That is what the National Institute for Clinical Excellence does all the time.

Hilary Benn: That is true but one of the things we are dealing with here, as we have already touched upon, is the range of probability and the uncertainty. Quite how you would come up with a figure, given that, I do not know.

Q289 Martin Horwood: A risk management approach—and you have quoted the example of flooding where we are talking about 1:100 or 1:75 being acceptable—surely does have to be based on data. There are flaws in this process because it is based on past data and, as Professor Watson said, we have the inevitable climate change coming into play which actually changes the baseline, as it were, as you are going along. So 1:100 becomes 1:3 towards the end of the century in terms of flooding. You do need a data-based approach, do you not, for risk management to work?

Hilary Benn: Yes, we do.

Mr Mortimer: The Climate Change Act also has within it a requirement on government to produce a national risk assessment by 2011 and that is a major piece of work which we are now doing and which the Adaptation Sub-Committee, which Lord Krebs is chairing, is scrutinising us on. Alongside that is an economic appraisal where we are attempting to do the very thing you are suggesting, namely to look across the whole economy and society and ask where the greatest impacts are likely to be, where the greatest risks, whether we can quantify them and how we can prioritise across government programmes as to where the most significant impacts lie. We are in the process of doing that but obviously it is a major piece of work and will take the full time we have been allowed under the Act. That is work in progress.

Q290 Martin Horwood: That sounds very welcome and I suppose in a sense that would perform a job for adaptation that Stern did on mitigation. However, there is a bit of a problem with that as well. These are very top level quantifications of the risks, are they not? UKCIP has pointed out that there is a bit of a

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trend towards all this stuff being top-down, whereas a lot of the actions that are required are going to be by primary care trusts and local authorities and people like this. How are you going to try to get that risk management approach to percolate down? Has any attempt been made to communicate with staff at local level about this yet?

Mr Mortimer: Take local authorities. One of the things we have been working with local authorities on following publication of the projections is that very question: how can they take the projections and look at their own services. A current example I know is Nottinghamshire County Council which is looking across its services at what the risks might be, using the scenarios to understand the impact on social services and on transport and so on. Our job is to help them think through how they quantify and manage those risks, make the trade-offs and decide on the investments. You are right that it is absolutely ultimately local decisions which will determine a lot of adaptation effectiveness. What we are trying to do is provide the framework within which those decisions are taken.

Q291 Martin Horwood: Do you imagine a similar process happening where people are organisationally remote? Imagine people like Network Rail or other independent bodies which also have to adapt. Is this framework actively going to encourage that?

Hilary Benn: Sure and one of the organisations which is going to have to report under the Reporting Power is indeed Network Rail. They are going to have to indicate to us and to broader society what they think the potential risks are and the plan for dealing with it. That is why I said at the beginning that this process which has been put in place is very practical because it is about trying to answer the questions that you and other members of the Committee are rightly putting and it will help us to get a better understanding of where people have got to and where we have yet to go.

Q292 Colin Challen: I am wondering how wide we should set the boundaries for public responsibility for the private impacts of climate change on private individuals or private property. Some communities, as a consequence of climate change, may suffer more than others. What is our responsibility to them? How should we define it?

Hilary Benn: I am not sure I quite understand the question.

Q293 Colin Challen: Let us say that we accept that a certain coastal erosion is the result of climate change not only the fact that the east of England is sinking down. You suggest that the only costs that the public purse should cover would be the cost of people moving out and the cost of demolition; although I do not quite understand why demolition should be involved since the sea will do that for nothing. That is the kind of example. Other communities could be identified by the Environment Agency as prone to

flooding because of climate change or whatever. Should we all take responsibility where there is a localised impact?

Hilary Benn: We do all take a responsibility to the extent that we are spending more on dealing with flooding and coastal protection. We were discussing earlier what the size of that amount is going to be. This is exceptionally difficult because it is one thing if your home floods and it does not happen again for another 25 years or it never happens again. It is a whole other thing if your history, your culture, where you were born, where your kids were raised, is facing the prospect of being reclaimed by the sea. You go down the East Coast in particular, where of course the coast has been moving and eroding, reclaimed in some places, over the centuries. This is exceptionally difficult. We have to be straight and say that even if you had unlimited pots of money, depending on what happens to sea level rise, you get to a point where you are not going to be able to defend everywhere. Our starting point has to be that we will do our darnedest to defend as much as we can, which is why we are putting more money in, which is why communities themselves might want to do it. A second example of the responsibilities we are taking is the Coastal Pathfinders example that I gave. How you adapt to that. You might have a road which is vital for getting tourists to the beach they want to enjoy and it is going to crumble into the sea. If you can build a new road a bit further back, then you can sustain those opportunities for tourism and the local businesses that depend upon them. This is very, very practical stuff that the people in those communities themselves are best placed to understand and weigh the pros and cons of what needs to be done. Those are two examples of how we are trying to assist in those circumstances. The third point I would make about the small “p” politics of this is that we have the structure with the Environment Agency and what it does, we have local authorities which lead on the shoreline management plans. It does not work if you have communities and their elected representatives saying to the people who are trying to put the plans together “You are the cause of this problem”. We have to share responsibility for this. I feel this very strongly. Having seen where it works well, that is the right approach. In the case of the Environment Agency, its job is to say that this is the problem, here is a range of things we might be able to do and this is what we might be able to contribute. In future might you want to contribute something? Then we are in a better position to deal with the problem which faces all of us and not to get into institutional warfare. That is using too big a term but you have to get the relationships right because it is a shared problem not all of us face, whichever bit of the system we are working in.

Q294 Colin Challen: In cases where government policy, government of any description, in the past has led to the building of a lot of housing estates on flood plains, which is now perhaps not quite the case but up until recently, I can remember inquiries by this Committee into housing policy, it was the case and people will have bought houses in good faith.

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Perhaps local authorities are partially to blame as well. Then a few years later along comes the Environment Agency and publishes a map of flood risk. Immediately your insurance costs are going to go up. Should people be compensated for that? This is an adaptation question.

Hilary Benn: Compensated by whom, if you do not mind me asking?

Q295 Colin Challen: By the people who allowed the housing to be built in the first place.

Hilary Benn: That would be in the end the local authorities who gave the permission. I cannot undo the past and none of us can. What we can do is try to avoid the problem being repeated in the future. The single most important thing that we have done is to strengthen PPS25¹² by saying that the Environment Agency has to be consulted as a matter of course. The evidence is very clear. The last time I looked at the figures—from memory and I will drop you a note if I have the precise figure wrong—about 96 or 97% of the decisions were going in accordance with what the Environment Agency had to say about flood risk and whether the development should be allowed or not. We have learned the lesson of that and I think we have a pretty good system in place. The question for each individual application is what is the risk and can you defend against it? We are sitting in a flood plain, we have the Thames Barrier downstream, which I think the Committee has visited, and that means that we are protected. Those are the things that planning authorities have to take into account. Ultimately they have a responsibility. Government have to set a proper framework and in PPS25 we have done that to avoid adding to the problem to which you have rightly drawn attention as a result of decisions in the past.

Q296 Colin Challen: The Government quite rightly is publishing more and more information, assessments about climate change impacts and so on. That could raise people's expectations that the Government will do more to protect them and that is a reasonable linkage. Should we not be looking at also publishing guidance on what kind of assistance people should be able to expect and what not to expect?

Hilary Benn: One example of adapting to flooding is the way in which your home is built. During the course of 2007 I visited a lot of homes which had been flooded, some in Mr Horwood's constituency. Not surprisingly, a lot of them were in places like Riverside Close and River Road. The impact was absolutely devastating for people. The way in which you repair can have an impact on how difficult it is going to be in the future for you to recover, should you flood again. The classic example of that is the Slug and Lettuce pub in York, for those who have been to that establishment. It floods quite frequently but they have hard surfacing, the electricians are up high, the last time I was driven over the bridge there were people standing in their wellies having a drink and when the water goes down they sluice it out and

carry on. There is a very adapted set of premises which has learned to live with that. One of the other things we have done in the wake of the 2007 floods is to run some pilot schemes on property level flood protection. I went to visit one in Leeds which works really well. Flood guards, flood boards, air brick covers. There the community have come together and people were helping each other. I talked to one man who said that if his neighbour was out he knew where the flood boards were and he would stick them on his house. We now have a slightly bigger scheme where we have given some funding to local authorities and said it would be really good if they could match that because it is a shared responsibility. Not all the money can come from government in those circumstances. Even if you cannot have a community-wide flood defence scheme that will protect everyone and in the Cumbrian floods, having been to Cockermouth I then went to Carlisle to see the fantastic benefit of the £39 million flood defence scheme that stopped 3,500 homes from flooding, as happened in the great 2005 floods but you cannot do that at every level and therefore then thinking about how you adapt at property level, the kind of plaster you use, whether you have carpet or solid flooring, these are all examples of steps which can be taken to try to make our homes more resilient should flooding occur again.

Professor Watson: What we also need to do, when local authorities look at issues such as coastal erosion, is to take a fairly holistic view. For example, one area where there is significant coastal erosion today is in Happisburgh in Norfolk. If you simply try to protect the area around Happisburgh through some hard structures, you can actually get some more coastal erosion south of Happisburgh and potentially flooding into the Norfolk Broads. One has to look on a fairly large scale, 50km to 100km, as to what, if you put hard structures in one place, are the potential implications for other places along the coast. When you look at the ideas and whether you protect or retreat, whether you build in a way that actually can sustain floods—and you cannot sustain much coastal erosion if you build on a cliff—we need to make sure we understand the implications of an adaptive strategy on one part of the coast and how it might affect other parts.

Q297 Colin Challen: In mitigation terms we have the Carbon Trust and the Energy Savings Trust. In adaptation terms should we have a similar body which is clearly recognisable, a one-stop shop or have we already got one and I have just missed it?

Hilary Benn: It is a really fair question. If you like, the programme that we have put in place in the wake of UKCIP's publication last summer was the beginning of that. It is clear that there is an increasing thirst for advice, guidance, practical examples, how to do it, manuals and so on. One of the things we will need to think about is the best way to give that. It will not just be about central government. If you take architects as a profession, there is a whole network where architects talk to each other and share good practice and ideas and have conferences and so on, getting it into there,

¹² Planning Policy Statement 25

people who are designing buildings, builders in their building techniques. We need to use all of these methods to get awareness out, for people to see how you can do it differently, showing by example. I think that way lies the best chance of getting more people to get on and make it happen. That is the way I would see it.

Q298 Martin Horwood: Secretary of State, you did visit my constituency and it was very much appreciated at the time. I am sure you will intimately remember the area we visited, which was called Whaddon. There are some bits of Cheltenham which are already fitting very expensive flood defences and I am sure in time they will be fitting Indian shutters and solar powered air conditioning systems and things like that but I do not think it will be in Whaddon, which is one of the least well-off parts of the constituency; it also has people who are not only relatively poor but may be vulnerable because they are elderly or because they are disabled. We often talk about the vulnerable being the first to be hit in climate change, but that is going to be true in this country as well, is it not? Do you have or do we need special strategies for vulnerable groups like that who are unable to adapt to climate change as easily as people who are better off either physically or financially?

Hilary Benn: We have tried to prioritise the way in which we have allocated some of the money out, although ultimately that responsibility really has to rest at the local level. That is not to say what you have raised is not a national issue because it rightly is. The people who know the local community best are indeed the local authority and that is why, when we have given the funding for the property level protection, it has been in response to bids from local authorities because they know whether they have a problem they need to deal with and why we have said we did not seek to instruct them so it has to be match funded; clearly you make the money we have been prepared to put in go further if you match it with funding yourself. It is then really for local communities to work out, through the local authorities, how they are going to prioritise what needs to be done on the ground.

Q299 Martin Horwood: If I may say so, there is a broader social issue, is there not? At national level you could say that there are clearly identifiable groups, whether it is the people who are poor enough to have so many other worries in their lives that they do not really want to worry about the possibility of a heat wave next summer or it is people who are too frail to be able to do some of these things, people will need to adapt. How do we engage with those groups? Are you going to be developing strategies, giving advice to local authorities on how to do that? What do you think the best way of engaging with those groups actually is?

Hilary Benn: Some of the vulnerability you have drawn our attention to is place specific, because they are places where there is a risk of flooding and there will be others where that is not the problem, which is why I answered your previous question in that way.

Others. If you take air quality, you think of summer temperatures, not much wind, concentration of smog, there are already schemes operating in different parts of the country. I saw one in Brighton about a year and a half ago, which was very good, where you register with this service and if the air quality is going to be bad, then it sends you a phone message or a text. We see that increasingly in weather forecasts: there are weather warnings; there are air quality warnings and so on. It seems to me that is another example of adapting to assist people who are particularly vulnerable because they have asthma or respiratory conditions.

Q300 Martin Horwood: Let us take that one example of elderly people, potentially very vulnerable in a heat wave, not particularly place specific. Do you see it as your Department's role or as the Adaptation Sub-Committee's role to advise local authorities or local health authorities on what to do to protect elderly people in that situation?

Hilary Benn: I would say those who have responsibility at the local level in this particular case we are talking about, the impact of air quality on health, will be the primary care trust. That is one of the things they ought to think about and the fact that there are several of these schemes operating in the country already shows what can be done and it is certainly something I would encourage. In the advice and the guidance and the awareness-raising that we do that is a really good example of something we should talk about but the responsibility for responding to it is with those who have the lead responsibility for looking out for people's health.

Q301 Martin Horwood: So it is not a national responsibility at all to advise on that.

Hilary Benn: No, I have just said it is a national responsibility to advise but I am saying the lead for what you then do about it, it seems to me, would need to come locally.

Q302 Chairman: Are there aspects of adaptation which need to be dealt with regionally?

Hilary Benn: Good question. Specifically regionally?

Mr Mortimer: On some aspects, where there are regional structures in place, we work with them and through them. Take economic development, we are working with the RDAs¹³ as part of regional partnerships to look at how they might need to think about adaptation in terms of economic strategies, for example. Where there are regional structures then yes, it does make sense for us to work through those.

Hilary Benn: I was thinking, to answer your question particularly about regional aspects to climate change and therefore adaptation needing to be different in different places, that we already alluded to one: water supply. Obviously there are places where flooding is a particular risk and in the south-east we really have to be more efficient in the way in which we use water. That is a really good example. It is different in the north-east if you have Kielder and

¹³ Regional Development Agencies

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a lot of rain. It is very different in the south-east if you do not have a lot of rain and you have a growing number of people.

Q303 Mr Chaytor: May I ask a little bit more about the position of local authorities? One local authority has apparently achieved level three in its adaptation planning, one out of the best part of 150. What can be done to spread best practice more effectively amongst local authorities?

Hilary Benn: All local authorities will have to report in relation to the indicator; about one third have adopted NI188¹⁴ as a priority and just about half are at level one or above; level nought being not even at the races and level four getting on with getting it taped. It is a process and this is self-assessment and locally it is a question that local communities and indeed councillors need to ask. I was interested in the evidence you had about the extent to which elected members are engaged in this. I would say from our point of view that there is some way to go. I am not singling out elected members. I am just saying that right across the piece we need to get those with responsibility for taking these decisions, a number of which we have touched on in conversation already, to see this as an important part of what they do and that is why there is a particular project for training and awareness-raising which we are going to do during the course of this year to try to engage that particular group of decision-makers.

Mr Mortimer: Yes, as well as elected members.

Q304 Mr Chaytor: To come back to the case for parallel organisation, to the Carbon Trust to provide financial support but also models of good practice, examples of good practice, is the local government sector exactly the part of our national system that could provide this kind of lead, given that they are absolutely in the firing line of the climate change impact and the expertise, engineering, planning, transport, infrastructure, emergency planning is all there in local councils? Should they not now be establishing a national institute that would disseminate good practice in this way?

Hilary Benn: That is for local government and its responsibilities. I have no doubt one of the things they will want to address is how we best support all local authorities in doing these things. No sooner do you ask the question than I am reliably informed that we are tomorrow—it cannot be said we do not respond to the Committee's requests—launching a guide for elected members at the LGA¹⁵ conference in Liverpool. I think that demonstrates not only that we have a programme but that we are on the case.

Mr Chaytor: I could not ask for a better reply.

Q305 Chairman: I wish all our recommendations were responded to with similar alacrity.

Hilary Benn: I do my best. When it comes to the rest of society, whether it would make sense for the business community to be looking to local authorities to give them that kind of advice, I am not so sure. You have raised a fair point about what are

the most effective means going forward, once we have got past the awareness-raising stage, in which we are still engaged at the moment, to make sure people have a good place to which to go to get advice and information. There is a consultancy world that is growing up in the UK and indeed you were saying earlier that people are coming to the UK to talk to those kinds of consultancies because they recognise that we are further along than perhaps the countries they are coming from.

Q306 Martin Horwood: What research do you think has been undertaken to assess how well business and the private sector are really preparing for this?

Mr Mortimer: We are doing some. We are doing a benchmarking exercise to look at levels of awareness and the truth again is that it is very mixed. There are clearly some companies who have a direct interest because their supply chains may be impacted overseas, for example, who have done quite a lot of work in this area. There are others who frankly are at first base. Interestingly the CBI is itself just doing a major piece of work looking across UK industry at climate risks and is launching a report later this year. I was talking to a group of them yesterday. We are beginning to see more interest from the private sector but I would say that it is patchy.

Q307 Martin Horwood: Have you done any work on what you think should be the priority sectors and, if so, how have you gone about actually identifying them?

Mr Mortimer: At the moment the priority has been to focus particularly on the providers of public benefits, particularly the privatised utilities would be the first on our list of priorities. Beyond that there are sectors which we are looking at. We consulted last year on whether we should ask on a voluntary basis some sectors, like food retailers for example, to report, sectors which could be in the front line but which lie beyond the powers in the Climate Change Act. There is some possibility for us to look to them to report to us on a voluntary basis.

Hilary Benn: For the sectors for which Defra has particular responsibility, we have discussed water and flooding quite extensively but food and farming is a really good example. If you look at the Food 2030 document which we published at the beginning of the month, there is a fair bit in there about the need to adapt, how we are going to grow more food with a changing climate, water under more stress. We have not talked much about pests and diseases relating to crops and things; take something like phytophthora which is an increasing problem particularly in the south-west and elsewhere. We have a very big research programme trying to understand how to deal with that. That can affect some of our much loved trees that shape the landscape that people enjoy and value. The one other example I would give in relation to food is some research that we have been co-funding at East Malling. The strawberry industry in Britain is big, it is worth about £200 million a year, it is growing—no pun intended—and they are extending the growing season. They have found, by analysing very, very

¹⁴ National Indicator 188

¹⁵ Local Government Association

carefully when the strawberry plant needs water, that you can grow just as good a strawberry, that tastes just as nice, using about one seventh of the water that commercial growers currently use. I saw that for myself when I went on a visit in the summer. There is an example of government funding and Bob leads on this in terms of our research programme. We are putting some more money with the Technology Strategy Board into food and farming research and one of the things it is going to be looking at is the impact of climate change and adaptation. The task then, if you have something that works, and this is the private sector we are talking about, is how to get it out there so people take up that approach because it will help them to continue to grow strawberries if it does not rain so much.

Professor Watson: In fact one of the reasons we are working with the Technology Strategy Board is that they work directly with the private sector so you know any information and knowledge you get will be directly useful. The other comment I would make is that when we think of infrastructure and we are going to have to make major investments in infrastructure over the coming decades in the UK, the challenge is how to think of infrastructure in a much more holistic way. Rather than thinking how to adapt to climate change in the energy sector, the transport sector, the water sector, the waste sector and IT, we have to realise that there are major interconnections between each of these sectors. The question is how we are to understand the inter-relationship between all of that infrastructure and there is some really interesting thinking going on in trying to think through how we could have a sustainable transition in infrastructure, recognising the connections between energy, transport, water, IT, waste, food and the agricultural sector. We have to get away from thinking sector by sector by sector to think about it in a much more integrated way.

Hilary Benn: I would just add one other thing. If one takes the parallel with climate change and mitigation, one of the things which has been quite striking in the UK has been the movement from within the corporate sector to report; think of the Aldersgate Group and so on. Secondly, it has been investors asking these questions. This is a really powerful encouragement, certainly to medium- and bigger-sized businesses. The first question has been: what is your exposure to carbon? The second has been: what is your exposure to a changed environment given the nature of your business? It is not just in the UK, because if you are importing stuff, from a country where the climate changes and it does not rain and what you import is dependent on that or other things happen, we have not really touched on this yet but it seems to me that is going to be quite a powerful force because people who are thinking of investing in businesses want to know whether it is a good investment for the medium and long term. The projections help and that is why one of the things we have said in publishing the projections is that whoever you are, whatever you are doing, this is there for you to look at. You know

your business best. What implication do you think this might have for what you are doing now and what you may want to do in the future?

Q308 Martin Horwood: Picking up for the moment the issue of the food supply chain which surely must be up there with energy as one of the most critical, that is hugely dependent on what is going on in other countries. Have you had any international discussions about things like the future of food security, adaptation and how to consider that internationally?

Hilary Benn: We have. We are 60% self-sufficient overall in food; we are 73% self-sufficient in the food that can be grown here. Interestingly, we are more self-sufficient in food now than we were in the 1930s and 1950s, which I must say surprised me when I first learned that. The peak was at the height of the Common Agricultural Policy but that was not a very good policy when it came to the natural environment or indeed for the life chances of farmers in developing countries whose nascent business we were undercutting with dumped stuff. If we are going to have another two and a half to three billion human beings on this earth in the next 40 to 50 years—and that is what the indication seems to be—we are going to need a big increase in food production. Both because of that and because as people get better off, they buy more and eat more, they consume more meat and cheese, more dairy products. Internationally, through the FAO,¹⁶ the work of the global partnership, we are both trying to support people's direct needs for food; where drought happens we put more money into the World Food Programme, we look at the problems in Ethiopia and that recurs. Fundamentally we need two things. Norman Borlaug was more responsible for the agricultural revolution of the last 40 to 50 years than anybody else; he developed the dwarf variety of wheat which has meant that grain production has kept ahead of population growth. We need science to come and help to do this again. Just to give you an indication of the scale of that achievement, if grain yields had stayed where they were in 1950, if they were still there now, you would have required an area of land the size of Latin America to be growing what we are growing today. Mark Twain famously remarked "Buy land because they have stopped making it". We need science and we need, in Africa in particular where the agricultural revolution has not taken hold, for the prospects for farmers to improve and that is about seeds, tools, finance, security on the land.

Q309 Martin Horwood: May I draw you back to the British private sector which is where we started this question? Wearing my all-party-group-on-corporate-responsibility hat, I know that there are quite a lot of networks out there which have been used a lot to promote responsible climate change mitigation measures; the corporate responsibility movement but many other green business

¹⁶ Food and Agriculture Organization of the United Nations

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organisations. Are you using any of those networks to start British companies talking about adaptation? I have to say I am not aware of a lot.

Mr Mortimer: Yes, we are. We have our own partnership group in the Department with a range of organisations including some in the private sector. We use networks, particularly some of the professional networks, so the environmental risk managers, the architects, the engineers, professional groupings who work across sectors. Thirdly, I would highlight what the Secretary of State said around the finance sector. The ABI¹⁷ and the investment groups clearly have an important role to play in talking to a whole range of clients. Obviously we are a small team and we are fairly limited in the number of direct relationships we have with individual businesses but we try to use those networks as much as possible to get the message out.

Q310 Chairman: Within the financial services sector the Government now controls one of the biggest banks in the country. It would be possible to analyse

¹⁷ Association of British Insurers

their lending policies to see what account they are taking of the risks to their customers and borrowers that adaptation to climate change involves.

Hilary Benn: Sadly I have a pretty good idea. I suspect that the conversations which have been taking place over the last year between the banks and their new part-owners have been about something else.

Q311 Chairman: There is time for those discussions to move on to this agenda. We are coming to the end. We are very grateful to you for giving us this time this afternoon. It is a really interesting and important subject for us.

Hilary Benn: It was a pleasure.

Q312 Chairman: If there are things we want to follow up with your officials, we may wish to do so in the next few weeks.

Hilary Benn: With the greatest of pleasure and we look forward to your report.

Written evidence

Memorandum submitted by the Historic Houses Association (HHA)

INTRODUCTION

The Historic Houses Association represents the interests of Britain's historic houses, castles and gardens in private ownership. The HHA has 1,500 member properties of which nearly one third are regularly open to the public and a further 250 do so, on a part-time basis. The only criterion for membership of the HHA is that the member property is listed.

The HHA estimates that approximately two-thirds of the built heritage is privately owned and maintained. Between them HHA members represent, collectively, one of the greatest "ownership" of listed buildings in Britain: both I and II* properties as well as of Grade II properties, many being ancillary buildings on large estates.

It is our members who manage much of the nation's finest privately owned heritage, paying for it and securing its future. Owners have extensive responsibilities in respect of the maintenance of both buildings and land, often at great personal cost. They have shown an increasing interest in and commitment to issues around energy conservation, both as measures to mitigate climate change and as a contribution to the efficient management of their properties.

SUMMARY

- Any measures on climate change adaptation and mitigation need to comprehend the particular needs of historic buildings and not be simply imposed in blanket fashion.
- The efforts of those responsible for the historic environment to adapt their properties in order to introduce measures that will ultimately play a role in mitigating climate change should be encouraged.
- The environmental benefits of maintaining historic buildings, as opposed to demolishing them and embarking on new build, should be acknowledged.

KEY ISSUES

1. The Climate Change Act 2008 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, that is 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. It is important to ensure that these processes fully take into account the particular needs of historic buildings which, by their nature may vary from those of more the recently built environment.

2. The HHA welcomes the development of a more robust and comprehensive evidence base about the impacts and consequences of climate change on the UK and of raising awareness of the need to take action now and help others to take action. Historic houses may have the opportunity to play particular roles in taking action to reduce the causes of climate change.

3. The HHA supports the need to mitigate climate change and promote better energy efficiency in homes. Indeed many of our member houses have already introduced energy efficient measures that are appropriate to construction of their individual houses.

4. Some historic houses are in a particularly strong position to develop small scale renewable projects and to maximise the use of biofuels, acting as examples of good practice in this area. For example, Stansted House in Hampshire responded to the situation whereby the rising price of oil in recent years has coincided with the falling value of chestnut coppice. In 2006, the Trustees decided to move to a biofuel heating system, utilising the chestnut coppice on the Estate. The boiler at Stansted is specified for high efficiency, minimising waste and double burning exhaust gases. The carbon emitted is balanced entirely by the additional carbon absorption from the management of the chestnut coppice, which is harvested on a 12–15 year cycle. Use of each tree is efficient too, because nearly 100% of the tree goes through the chipper, far more efficient than a normal firewood operation. The tiny amount of ash from the boiler, very high in potash, can go straight on the borders around the House.

5. However, the initial investment in such an operation is very substantial and the full capital costs inevitably fall on the owners. Under the circumstances, the provision of incentives, such as reductions in taxation on the purchase and installation of new equipment that will contribute to the mitigation of climate change, would help maximise examples of good practice such as that at Stansted.

6. Historic houses often have access to and utilise sustainable, renewable energy sources and there is an inherent environmental value in conservation as against new build. Dr Edmund Werna of the UN's International Labour Organisation, encourages heritage conservation, because it "promotes small and medium enterprises, causes the drop of foreign exchange requirements by 50 to 60%, decreases overall cost by 10 to 30% and reduces environmental impacts".

7. In addition, the planning system must take a flexible approach to the need for changes in the historic environment that enable energy saving and other measures that may reduce the causes of climate change.

8. The CCRA and the 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, should bear in mind the unique challenges and opportunities which face the historic environment in this respect.

9. Many historic houses are businesses that act as the hub of local economies, particularly in rural areas, generating an economic contribution of over £1.6 billion and the maintenance of such businesses helps to reduce commuting and consequent enlargement of the carbon footprint, as does their emphasis on the cultivation and sale of local produce.

10. Under the Energy Performance Building Directive, Member states will be required to introduce by 2010 energy performance standards, which all buildings must eventually meet. HHA has urged the UK Government to accept and implement the exemption which is provided for under this Directive. Many historic houses and buildings will not be able to adapt to the aspirations of building control without potential damage to important historic features. In worst cases an inflexible approach may see the destruction of original windows, doors, flooring and roofs; while the long-term damage as a result of ill considered "improvements" to ventilation can lead to outbreaks of dry rot and death watch beetle.

11. There are clear environmental benefits in maintaining historic buildings rather than demolition and new build. Much of the "green building" movement focuses on the annual energy use of a building, but the energy embodied in the construction of a building is 15 to 30 times the annual energy use. A recent study in the United Kingdom found that it takes 35 to 50 years for an energy-efficient new home to recover the carbon expended in constructing it.

12. According to the American academic Dominic Rypkema, "100% of heritage conservation advances the cause of the environment. You cannot have sustainable development without a major role for heritage conservation, period. The loss of historic buildings is the polar opposite of sustainable development; once they are gone they cannot possibly be available to meet the needs of future generations".

1 October 2009

Memorandum submitted by Consumer Focus

Consumer Focus welcomes the Committee's inquiry into adapting to climate change, and asks that it considers the impacts of these changes on consumers' needs.

This response sets out:

- the impact of projected climate changes on consumers, which are set to affect their homes and access to products and services;
- consumers' increased understanding of the threats;
- concerns about the lack of reference in Government policy to the needs of individuals; and
- some ideas on how to quantify and measure consumer resilience to the changing climate.

CONSUMER CONTEXT

These concerns are based on the findings of UKCP09. We have not stated definitive impacts within Britain as these are subject to location, scenario probability and Government and business decision-making.

1. Risk to consumers. Consumers are making investments today that may be affected by changes in the climate. There will also be pressure on shorter-term demands.

(a) Homes may be affected by:

Reduced summer rainfall:

- Risk of subsidence due to lower soil moisture levels. This can severely damage the fabric of houses, and can lead to higher insurance costs and/or requirements for consumers to pay significant amounts towards remedying subsidence before the insurance policy pays out.
- Competition for water resources, may mean higher bills, lower water pressure or restrictions on use.

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- Sea level rise, increased storm surge heights, coastal, river and surface water flooding:
 - Causes psychological distress, decrease in property value, reduction in the desirability of an area and a major impact on personal finance.
 - Risk of flooding means higher insurance premiums, which may deter homeowners and tenants from getting insurance.
- (b) Health may be affected by:
- Average temperature rise and increased risk of heat waves.
 - Higher temperatures pose considerable health risks for more vulnerable population groups, such as the elderly, the very young or those with pre-existing medical conditions. In the worst case, increased temperatures and heat waves lasting for several days may prove fatal, as occurred during 2003, which caused more than 2,000 deaths in southern England, 60% of which occurred in people aged 75 and older.
 - Problems may be compounded, for example, by the urban heat island effect which exacerbates thermal discomfort in cities, or by water restrictions limiting the use of water for consumers' domestic and recreational use. These increase stress on the healthcare system, which may delay access to appropriate care.
 - Flooding.
 - Causes psychological distress and has the potential to carry diseases.
- (c) Financial Services
- Climate change presents either direct or indirect risks on investments:
 - Direct risks through deterioration of the physical environment resulting from climate change impacts.
 - Indirect risks through changes in policy directed at reducing greenhouse gas emissions or for adaptation.
 - A recent survey of the 30 largest UK fund managers reveals that climate change is considered by a minority of pension schemes: only five schemes state that they will assess a fund manager's ability to manage climate change related risks and opportunities, and seven schemes require that their fund managers actively consider climate change related risks and opportunities as part of their ongoing investment mandate.¹
 - Insurers have made it clear to the Government that providing insurance cover to home owners is conditional upon Government increasing expenditure on flood protection.² Without insurance cover, securing a mortgage and selling a home becomes more difficult.
- (d) Energy
- Climate change has the potential to affect continuity of energy supply, for example:
 1. Flood risk to energy facilities.
 2. Sustained high temperatures on equipment ratings and reliability.
 3. Disruption to the transport of fuel to power stations or to homes.
- (e) Food
- Climate change will significantly affect the availability of food for import.
 - Changes in the British climate may affect:
 1. Crop yields.
 2. Availability of agricultural land, particularly in the East of England.
 3. Food prices.
- (f) Water
- Changes in the climate are expected to affect:
 1. Water availability due to changes in rainfall, and higher demand as a result of warmer temperatures.
 2. Water quality due to changes in temperature and rainfall patterns, treatment will need to change as a result.
 3. Infrastructure such as water mains or sewers, as a result of changing soil moisture content or high volumes of waste water resulting from frequent intense precipitation.
 4. The ability of sewerage systems to cope with surface water drainage resulting from intense rainfall.
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¹ FairPensions, 2009 http://www.fairpensions.org.uk/fairpensions_pdf/ResponsiblePensions_2009.pdf

² ABI Flood Manifesto, <http://www.climatewise.org.uk/storage/628/floodmanifesto.pdf>

(g) Other infrastructure: communication, transport

- The Pitt Review of the 2007 floods showed that communication is key during climate events. For example, the emergency response needs to include support consumers through both the media (to signpost consumers to the latest information) and the mobile phone networks.
- Increased temperatures and surface water can disrupt road and rail transport, which has a direct impact on consumers' own ability to travel and also on the supply of products and services.

2. Changes in consumer awareness. Consumer Focus surveyed British consumers in July 2009. The survey indicates that, compared to 2007 (when a similar survey was conducted by the Association of British Insurers) there is an increased feeling of risk among consumers: 43% now feel they are at risk from heat waves, up from 27% in 2007; and 31% of consumers feel that they are risk from flooding, up from 16%. This shows an increase in awareness and concern among consumers about these issues.

3. Consumers have an opinion. It is also noticeable that, in the 2009 survey, despite this widespread rise in awareness and concern, there is also a rise in people who think they won't be affected by any of these (13% in 2007 up to 25% in 2009). This could be explained by the fact that the number of consumers having no opinion on climate change impacts has dropped significantly from 28% in 2007 to 8% in 2009. Far more people now have an opinion about the impacts of climate change.

4. Climate change is not a middle class issue. Our survey showed little difference between social grades. There was a great deal of similarity in the responses, with around 5% difference between ABC1 respondents (where the head of the household has a managerial or supervisory role) and C2DE respondents (skilled and unskilled workers). However, the Pitt Review of the summer floods in 2007 found that low-income households are the least able to recover.³ A third of residents of social housing have no insurance and half do not have home contents insurance, as opposed to one in five of households on average incomes.⁴

5. Greater awareness of mitigation than adaptation measures. A lot of attention has been given to improving energy efficiency and reducing greenhouse gas emissions (to mitigate climate change) in the past decade, but consumers are as yet unaware of some of the main ways in which their lifestyles will be impacted by climate change and how they will have to adapt. Our survey asked consumers which methods they had heard of in terms of preventing (mitigating) and protecting themselves (adapting) from the effects of climate change. The responses showed that consumers had a much higher awareness of mitigation-related measures than adaptation measures.

GOVERNMENT POLICY

6. Recognition of consumer needs. Consumer Focus welcomes the review of government policy on adapting to climate change, as it shows that work is underway across Government to prepare for changes. However, it also shows that plans lack relevance to individuals as they are focussed on large-scale systems with some reference to existing interfaces with consumers, with no consideration of the needs of the individual. For example, management of the housing stock is limited to adapting planning policies and building regulations (NAO, p59), which will not affect the majority of homes. The following two sections consider the gaps and how they can be filled through adaptation of existing policy approaches.

ADAPTATION REPORTING POWER

7. Homes are a strategic issue. We are concerned that the consultation on the Adaptation Reporting Power did not reflect the importance of individuals' homes to wider society. Defra recognised that the impact of climate events can be devastating for individual householders, but states in the consultation (4.73) that "they are unlikely to have nationally significant repercussions". Consumer Focus disagrees. We have seen in the past year the effect of activity in the property market on the nation's economy and consumer confidence. A failure to reflect the needs of the individual may also, in time, undermine the public's perception of the Government's wider approach to climate change adaptation.

8. 70% of the existing housing stock will still be standing in 2050 but current plans only affect new homes. Defra should use the Reporting Power to manage the risks facing the existing housing stock. The current plans, as documented by the NAO, do not reflect the risks listed above. The intention to update the Code for Sustainable Homes only affects new homes, and a minimum standard is not set for private developers in England until 2016. Building regulations do not affect existing buildings, for example this summer we have seen CLG step back from its commitment to consult on embedding energy efficiency measures in regulations for changes to existing buildings (known as consequential improvements) into Part L of the building regulations.

9. Financial services are essential providers of products and of information. Her Majesty's Treasury (HMT) is reported by the NAO to be waiting for the UK Climate Change Risk Assessment and Economic Analysis in order to inform further consideration of climate change risks and policy development, but in the

³ Pitt Review, http://archive.cabinetoffice.gov.uk/pittreview/_/media/assets/www.cabinetoffice.gov.uk/flooding_review/pitt_review_full%20pdf.pdf

⁴ *ibid.*

meantime considers that the impact could either be positive or negative dependent on the scale of the change and cost of adaptation measures (p87). It is therefore vital that financial services are included under the reporting power, potentially through the Financial Services Authority, and therefore in the risk assessment.

- The insurance sector has a key role in reporting the financial costs of more extreme weather on a macro scale, and is an essential service for consumers who are vulnerable to or have suffered from extreme climate events.
- Mortgage providers should consider the risks posed by climate change to the value of homes, not only to flag up those risks to buyers but also to manage the risks to their business and therefore the economy.

10. Think Small First, but include the consumer in that thinking. Consumer Focus considers Defra's approach to reporting from the energy sector, focussing on generators and distributors, to be proportionate. However, these companies are not necessarily visible to the consumer, who can feel very vulnerable and isolated in the case of disruption to energy supplies. We would like these reports to include specific references to communication plans in the case of emergencies, plans which are likely to involve the energy supplier.

11. A voluntary invitation to report (as proposed in Defra's consultation) does not reflect the necessity of food supplies and the level of risk they face from both gradual climatic changes and severe climate events. Consumer Focus wants the upcoming Food Strategy for the Future to provide a more coherent reporting mechanism for that sector. Whether a report is co-ordinated by industry, by the Food Standards Agency or the Government Office for Science (which is exploring the policy framework for the food system and climate change) the resultant information needs to be open to public scrutiny as with reports under the adaptation reporting power.

12. Communication services are vital in times of extreme climate events. Defra's consultation considered the need to report on the adaptability of standard functions, but Consumer Focus would like the Reporting Power to drive improvements to communications during events such as the floods of 2007. For example, it appears there is a need for:

- better sign-posting from the media (print, television, radio) and a local helpline; and
- development of an emergency response by the phone sector in order to:
 - provide mobile charging units, battery swap facilities and internet access in periods of large-scale power cuts; and
 - share mobile networks to allow greater access to those in need.

OPPORTUNITIES TO EMBED ADAPTATION IN GOVERNMENT POLICY

13. Better information on past flooding, and future flood risks, should be provided through a compulsory flood report in Home Information Packs; complete with reference to projected changes in climate. Consumers, particularly at the point of purchasing a home, should have access to plans for existing and proposed flood defences in areas that face an increased risk of flooding.

14. As ambient air temperature increases, more energy is required to cool a building. Cooling measures must be included in domestic energy assessments to ensure cooling is referenced in each property's Energy Performance Certificate. This measure should be complemented by advice on low-carbon cooling measures.

15. Information on a home's climate resilience should not only be provided when property changes hands; the proposed smart meter and heat and energy saving programmes provide an opportunity to undertake audits to assess the energy efficiency and climate resilience of the housing stock; complemented by a social marketing campaign to help consumers reduce their energy bills, and related carbon emissions, and adapt to a changing climate.

16. Projected climate impacts must be taken into account in the delivery of housing and regeneration, and in the development of sustainable communities. Property should be included in preparations for climate changes, initially through the inclusion of homes and insurance cover alongside other elements of the national infrastructure in the application of the Adaptation Reporting Power in the Climate Change Act 2008.

17. Prepare consumers by including climate resilience in the development and delivery of the community and domestic aspects of the Heat and Energy Saving Strategy, to complement the infrastructural measures undertaken by the Environment Agency, the water industry and others.

18. In terms of reporting authorities responding to the Adaptation Reporting Power, we would like the Financial Services Authority (reporting on insurers and mortgage providers) and the housing sector (potentially reported on in England by the Homes and Communities Agency) included in the list of the required reports.

 QUANTIFYING CONSUMER RESILIENCE

19. Measuring the impact of climate changes on consumers could inform efforts to engage individuals in, as carbon reduction measures, as well as helping them to adapt. However, consideration must be given to how those impacts are communicated, as people will react differently to warning messages.

20. Consumer Focus considers the following could be useful high-level indicators of consumer resilience to climate changes. Reports should reflect different climate scenarios over time, with reference made to both the likelihood and impact of the related risks which together will drive the proportionate response.

- (a) Homes
 - Number of homes at risk from:
 - subsidence;
 - flooding;
 - significant overheating.
 - Number of homes protected by flood defences; and number and proportion of homes at significant risk of flooding that will be protected by planned defences (by year).
- (b) Health
 - Coverage of plans to assist consumers in the event of flooding and heat waves, in support of their physical and psychological health.
- (c) Financial Services
 - Number and proportion of pension and investment funds considering the risks of climate change.
 - Number of homes at risk of flooding without insurance cover.
 - Cost of flood insurance in areas at significant risk of flooding.
 - Number and proportion of flood insurance products that provide resilience measures in the event of flooding.
- (d) Energy
 - Proportion of supply at risk from rising temperatures, sea levels, or climate events.
- (e) Food
 - Proportion of imported food at risk from changes to the climate.
 - Proportion of British grown food at risk from changes to the climate.
 - Proportion of British agricultural land at risk from flooding.

ABOUT CONSUMER FOCUS

Consumer Focus is the independent champion for consumers across England, Wales, Scotland and (for postal consumers) in Northern Ireland. We operate across the whole of the economy, persuading businesses and public services to put consumers at the heart of what they do.

2 October 2009

 Memorandum submitted by Groundwork UK

SUMMARY

- Groundwork would like to see a prioritisation of the role of green infrastructure in minimising and managing climate change risks. The natural environment should be a major underpinning element of a statutory national adaptation programme. Green infrastructure strategies should also be incorporated into the Local Government Performance Framework, and embedded into planning processes.
- Adaptation measures delivering improvements to green infrastructure could contribute to a range of government objectives, particularly those tackling environmental, social and economic inequalities. Supported employment programmes in environmental management, for example, could meet adaptation needs in vulnerable areas whilst also tackling unemployment and supporting health services.
- Despite the cost-effectiveness of “green” adaptation measures and the significant benefits it can provide, there is a lack of resources available for the creation and especially the long-term maintenance of green infrastructure. The expected squeeze on local authority spending is likely to put increased pressure on budgets for environmental management. Groundwork would therefore like to see green infrastructure given a level of recognition and investment comparable with that of “grey” infrastructure.

- There is an important role for the third sector in helping individuals, local communities and businesses conduct their own climate change risk assessments and judge what actions they need to take. The third sector is particularly effective in engaging with those who are “hard to reach”.

1. Introduction

Groundwork is an environmental regeneration charity, supporting communities in need. We work in over 90% of the most deprived communities in England and Wales,⁵ and with three quarters of the local authorities in England and Wales.

Our perspective on addressing the challenge of adapting to climate change is informed by our many years of experience in working alongside communities, public bodies, private companies and other voluntary sector organisations to deliver action that brings about concurrent social, economic and environmental benefits.

During 2007–08 our achievements included:

- 5,500 ha of land physically improved or maintained;
- 177,000 trees planted;
- active support for 2,400 businesses;
- providing 59,000 weeks-worth of training;
- creating 2,900 jobs; and
- helping 2,300 people progress back into education, training, employment or formal voluntary work.

2. *The suitability of the processes and structures in and across Government departments for identifying, mitigating and managing these risks and determining the future priorities of central government’s approach to adaptation (and the National Adaptation Programme).*

2.1 Although a structure exists to facilitate interdepartmental working (ie, through the ACC Programme Board), there is a need to develop more “joined up” responses to the mitigation and management of climate change risks. We would also like to see a stronger emphasis on the mitigation, or minimisation as well as management of risk, for example by improving and increasing levels of green infrastructure.

2.2 Green infrastructure can help alleviate the consequences of climate change by providing cooling, wind breaks, water management, habitats for biodiversity and improving air quality. Recent research by the University of Manchester on “Adaptation Strategies in the Urban Environment” (ASCCUE)⁶ suggests that adding 10% green cover to built-up urban areas could keep maximum surface temperatures at a 1961–90 level up until the 2080s. In addition, green infrastructure can support efforts to cut carbon emissions by reducing the need for power consumption for heating and cooling, encouraging walking and cycling and also through carbon capture and storage.

2.3 Programmes to deliver improvements to green infrastructure could address risks identified by a range of departments, whilst contributing to departmental objectives. Supported work placements or volunteering activity in environmental management, for example, could meet adaptation needs in vulnerable areas, whilst also tackling unemployment, worklessness, and health inequalities.

3. *The overall direction for work on adaptation, the effectiveness of the statutory framework, the allocation of powers and duties and how well issues like social justice are addressed in adaptation policies.*

3.1 Groundwork supports the view of Natural England that adaptation of the natural environment should be a major underpinning element of a statutory national adaptation programme. To achieve this:

3.2 *Statutory guidance on adaptation* should highlight the specific contribution of green infrastructure to sustainable adaptation. These measures can be more sustainable and cost-effective than “hard” engineering solutions, as they do not add to climate change, cause detrimental impacts or limit the ability of other parts of the natural environment, society or business to carry out adaptation elsewhere. Further guidance and information on “green” adaptation measures should be signposted.

3.3 *Adaptation and green infrastructure strategies* should be incorporated into the Local Government Performance Framework and Local Area Agreements (for example by amending NI 188). They should also be included in Sustainable Community Strategies and the new Integrated Regional Strategies.

3.4 Measures of the adaptation of the natural environment should be included in *Climate Change Public Service Agreements (PSAs)*.

⁵ ie, 90% of the worst 20% super output areas in England and Wales.

⁶ Gill, S E, Handley, J F, Ennos, A R and Pauleit, S (2007) *Adapting Cities for Climate Change: the role of the green infrastructure.*

3.5 *Green infrastructure should be a key component of spatial planning*, embedded into regional and local planning processes. We welcome government commitments to revise planning guidance on green infrastructure (see “World Class Places”, the new strategy for improving quality of place),⁷ and also to review the Climate Change Planning Policy Statement.

3.6 New national Planning Policy Statements should draw together the following:

- The supplement to PPS1 on planning and climate change.
- PPS12 on Local Spatial Planning (which requires local planning authorities to assess green infrastructure requirements).
- PPG17 on open space, sport and recreation.
- PPS9 on biodiversity and geological conservation.
- PPS25 on development and flood risk.
- PPG13 on transport planning in order to promote urban green ways for cycling and walking.

3.7 All local authorities should prepare a green infrastructure strategy. If adopted as a Supplementary Planning Document, this can enable implementation across administrative boundaries eg, at a sub-regional level.

3.8 Local authorities should also adopt Natural England’s “Accessible Natural Greenspace Standard” where appropriate. This states that people living in towns and cities should have an accessible natural green space less than 300 metres (five minutes walk) from home.

3.9 *Social justice and adaptation policies*: Residents in deprived urban areas are more likely to be vulnerable to the impacts of the “urban heat island effect” and at a greater risk of flooding due to a lack of green infrastructure.

3.10 In hot weather, intense micro-climates, a lack of tree cover, higher concentrations of air pollution, combined with a greater prevalence of people with heart and respiratory disease result in excess deaths (around 2,000 in the 2003 heatwave).⁸ Deprived communities in urban areas are likely to experience rising levels of fuel poverty. Poorer residents often live in older houses which are harder to heat in winter and harder to cool in summer.

3.11 A lack of green infrastructure in urban areas also increases the risk of flooding. In the floods of 2007, two-thirds of the 57,000 homes affected were flooded from surface water run-off overloading drainage systems.⁹ Residents in deprived areas are likely to be less aware and worse prepared for an extreme weather event like a flood. According to the Environment Agency, poorer people are likely to be more exposed to flooding, but less likely to have home contents insurance.^{10, 11, 12} Improving green infrastructure around housing (and on housing with green roofs and walls) is a cost-effective and sustainable means of surface water management.

3.12 In recent years, however, the trend has been towards a decline in green cover in urban areas. This has resulted from development pressures, an increase in the use of front gardens for car parking spaces, and householder extensions. There has also been a lower rate of tree planting over the past decade,¹³ with more threats to older trees. In addition large native trees have tended to be replaced with smaller, ornamental types which provide less shade.¹⁴ Proposals to reduce planning controls for businesses undertaking minor works could also threaten the retention of urban trees and greenery. Climate change will create challenges for the management of green infrastructure, for example irrigation in times of drought so that it continues to provide cooling benefits when it is most needed. There are opportunities to provide this through the collection and storage of rainwater, which would also help to reduce flooding incidences.

3.13 A programme of urban greening could support trainees in implementing environmental improvements both to increase green cover and make practical differences to the quality of life in deprived communities. This could include:

- the promotion and development of green roofs in targeted inner city locations;
- the installation of rain water collection systems for irrigation; and
- natural flood management techniques such as restoring upland catchment areas and flood plains, and installing sustainable urban drainage systems.

⁷ “World class places: The Government’s strategy for improving quality of place” CLG, 2009.

⁸ Royal Commission on Environmental Pollution (2007) Twenty Sixth Report: The Urban Environment.

⁹ Pitt, M (2007) Learning lessons from the 2007 floods, Interim Report, Cabinet Office, London (quoted in “A Changing Climate for Business”, UKCIP 2009).

¹⁰ Environment Agency (2003) Environmental Quality and Social Deprivation: R&D Technical Report E2-067/1/TR Fielding J, *et al* (2005) Flood Warning for Vulnerable Groups: A Qualitative Study, Technical Report to the Environment Agency.

¹¹ Fielding J, *et al* (2005) Flood Warning for Vulnerable Groups: A Qualitative Study, Technical Report to the Environment Agency.

¹² Whyley C, McCorrick J & Kempson E (1998) Paying for Peace of Mind: Access to Home Contents Insurance for Low-Income Households.

¹³ “Greening the UK, Local Authorities Commitment to Urban Planting” HTA, 2008.

¹⁴ Britt, C and Johnston, M (2008) Trees in Towns II—A new survey of urban trees in England and their condition and management. CLG.

3.14 Our experience has also shown that employment programmes with an environmental focus are particularly effective in making the link between worklessness and wellbeing. Working in the natural environment can provide mental and physical health benefits and help overcome barriers to employment. It attracts high rates of volunteering and provides popular work placements for the long-term unemployed, people with learning difficulties and with mental health problems. Environmental programmes working with disadvantaged or truanting children, officially described as Not in Education, Employment or Training (NEET), have also proved remarkably successful.

3.15 For example, Groundwork installed green roofs on the Treverton Estate in West London, through its Green Team programme for 16–25 year olds. This supports those who find it hardest to get work with carefully tailored training and job placements. This innovative project provided much needed green space in an area of high-rise, high density inner city housing, whilst improving the skills of the trainees and providing greater future employment opportunities. Groundwork is now providing similar projects with support from the Future Jobs Fund.

3.16 From a social justice perspective, it is therefore imperative that adaptation policies prioritise green infrastructure improvements in areas of urban deprivation, where climate impacts may be high, but the lack of awareness and multiple pressures faced by these communities means that adaptation will be a low priority. In order to achieve improvements on a sufficient scale (eg, achieving a 10% increase in urban green cover), and to allow planting time to mature (eg, for trees to develop a large enough canopy to provide shade), immediate action is required.

4. *The funding, support, training and other resources available, including at a local and regional level, for:*

- *building capacity to adapt to climate change;*
- *specific actions to adapt to climate change, such as in investment in flood risk management or the resilience of critical national infrastructure; and*
- *helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take.*

4.1 Green infrastructure can provide cost-effective adaptation solutions. The Natural Economy Northwest programme¹⁵ has outlined a method for calculating the economic value of these measures by balancing the cost of investment with the benefits of:

- savings from reduced energy use and lower insurance premiums;
- the lower costs of “soft” as opposed to hard engineering measures;
- savings resulting from carbon capture and storage;
- increased investment levels and employment creation in previously vulnerable communities.

4.2 Despite the potential savings to be made by employing this approach, there are currently few resources available to provide for the creation and particularly the long-term maintenance of extensive green infrastructure. The expected squeeze on local authority spending is likely to put increased pressure on budgets for environmental management. Without adequate investment, the multiple benefits green infrastructure can provide will not be realised. As the Landscape Institute maintains,¹⁶ green infrastructure should be given a level of recognition and investment comparable with that of “grey” infrastructure, and to achieve this, government should develop a national funding stream for strategic green infrastructure investments through the Comprehensive Spending Review and annual Budgets.

4.3 Government should increase its investment in green jobs as part of its economic stimulus package, prioritising support for adaptation as well as mitigation activity. The Sustainable Development Commission¹⁷ has urged the Government to commit 50% of the total funding provided for economic recovery plans on green measures, up to £30 billion a year for the next three years. Through the Future Jobs Fund, for example, it is proposed that at least 10,000 of the 150,000 jobs it aims to create will be green jobs. The DWP should ensure that adaptation activity is supported through this and future investment.

4.4 We also support CABE’s¹⁸ proposals for CLG and DECC to co-create a Sustainable Neighbourhoods scheme to be delivered by local authorities and the voluntary sector. This could create ownership of the adaptation agenda through collective action at a neighbourhood level. CABE have also proposed that Defra run a competitive funding programme to promote urban green ways, with the Queen’s Jubilee in 2012 to be marked with the opening of hundreds of new greenways in every major conurbation across the country.

4.5 There is an important role for the third sector in helping individuals, local communities and businesses conduct their own climate change risk assessments and judge what actions they need to take. The third sector is particularly effective in engaging with those who are “hard to reach”.

¹⁵ “The economic benefits of Green Infrastructure: The public and business case for investing in Green Infrastructure and a review of the underpinning evidence” ECOTEC for Natural Economy Northwest, 2008.

¹⁶ “Green infrastructure: connected and multifunctional landscapes”. Landscape Institute Position Statement 2009.

¹⁷ “A Sustainable New Deal”, Sustainable Development Commission 2009.

¹⁸ “Hallmarks of a Sustainable City”, CABE 2009.

4.6 Consultation with local communities is crucial to developing adaptation actions that will work best on the ground. It should form a fundamental part of the process of developing adaptation strategies from the outset, and ensure communities are given opportunities to be involved in decision-making and active participation. Third sector organisations like Groundwork can support the engagement of local people, for example, in the design and management of public spaces. Groundwork can help ensure that these spaces meet users' needs, considering the likely increase in use with the changing climate. Community engagement on public space can also provide opportunities to raise awareness about the impacts of climate change and what action people can take to minimise the negative impacts for themselves and their environment.

4.7 The third sector can also support businesses in undertaking adaptive action, particularly reaching out to small and medium enterprises. Groundwork's Environmental Business Services can provide low cost, tailored solutions, often achieving benefits by working collectively with other local businesses, and contributing to wider environmental improvements in the local area.

5. *Whether work on adaptation should be embedded into existing sustainable development frameworks, and if so how might be this achieved.*

Adaptation should be embedded into existing sustainable development frameworks at all levels. As stated above in section 3, it is also important that adaptation and green infrastructure strategies are incorporated into the Local Government Performance Framework and Local Area Agreements. They should also be included in Sustainable Community Strategies, the new Integrated Regional Strategies and embedded into regional and local planning processes.

2 October 2009

Memorandum submitted by Waterwise

Waterwise is an independent, not-for-profit, non-governmental organisation focused on decreasing water consumption in the UK and building the evidence base for large scale water efficiency. We are the leading authority on water efficiency in the UK. We were the only NGO to sit on the UK Environment Minister's Water Saving Group alongside the water industry and regulators, for which we produced the Evidence Base for Large-scale Water Efficiency in Homes. Our aim is to reverse the upward trend in how much water we all use at home and at work. We work with governments, regulators, water companies, retailers, manufacturers, housing providers, NGOs, faith groups and other partners to deliver that aim.

EXECUTIVE SUMMARY

1. Water efficiency is a key tool in adapting to climate change. The 2009 UK Climate Impact Programme scenarios show clearly that we can expect less water to be available in coming years, and this, combined with demographic changes, means that less water is going to need to go further. Water efficiency is also a key tool in climate change mitigation.

2. Every sector of the economy is dependent on water, and water efficiency must be a key part of the adaptation strategy of any organisation.

3. Waterwise welcomes the Adaptation Reporting Power in the Climate Change Act, the setting up of the Adaptation Sub-Committee, and the commitment to Adaptation Plans for all government departments by spring 2010. We also welcome the work of the Adapting to Climate Change (ACC) Programme, in developing the National Adaptation Programme, including at local and regional level.

4. The government, regulators and water companies have all taken welcome steps in recent years to increase the water efficiency of new homes (through the Code for Sustainable Homes, and the introduction of water efficiency into Building Regulations this year), to increase metering (currently only a third of homes in England and Wales pay their water bills according to the amount they use), and to retrofit increasing numbers of homes.

5. However, water efficiency is neither mainstreamed across the economy, nor mainstreamed in the processes and procedures of government. The water efficiency of existing housing has not yet been sufficiently addressed. And opportunities to drive water efficiency alongside energy efficiency, development of the low-carbon economy and other climate change mitigation policies and strategies are often missed. Water efficiency must be a central part of every sector and organisation's adaptation plans. In the past, Waterwise has observed—across the economy—costly solutions being considered and taken forward before simple measures to waste less water have been exhausted.

6. Below, we set out proposals to rectify this, and to ensure the full contribution of water efficiency to the resilience of the UK economy to climate change is realised.

INTRODUCTION

7. Water efficiency is unique in that it is a key tool in both climate change adaptation and mitigation.

8. The 2009 UK Climate Impact Programme scenarios show clearly that we can expect less water to be available in coming years, and this, combined with population growth, rising household consumption of water, an increase in single-person households, which use more water per person, and much-needed new homes in water-stressed areas, means that less water is going to need to go further.

9. In addition, the heating of water in homes and businesses and the pumping and treating of water and wastewater by the water industry all have a significant carbon footprint—the heating of water in homes for cooking, bathing and cleaning accounts for 5% of the UK's total greenhouse gas emissions.

10. So wasting less water has dual benefits to the UK, helping to deliver both a climate-resilient economy, and government programmes to tackle change (and to meet the legally binding commitment to reduce carbon emissions by 80% by 2050).

11. Every sector of the economy is dependent on water, and water efficiency must be a key part of the adaptation strategy of any organisation.

WATER EFFICIENCY IN HOMES

12. The government has taken some extremely positive steps in recent years to ensure the water efficiency of new homes—including through the Code for Sustainable Homes, and the introduction of water efficiency into Building Regulations for the first time. However, two thirds of the dwellings that will be in use in 2050 already exist, and the broader challenge of making existing housing stock water efficient has not yet been sufficiently addressed.

13. The government is taking forward measures to increase the energy efficiency of the UK housing stock, including through ambitious and innovative plans to retrofit every home by 2030. *Waterwise believes that this programme should include water efficiency*—if homes which have received a retrofitting visit are still wasting water then a clear opportunity will have been missed to promote and deliver adaptation of the UK housing stock.

14. Only a third of homes in England and Wales pay for the water they use according to how much they use—only a third are metered. The UK is almost alone in the European Union in not metering every home for water, and successive Water Ministers at Defra since 2005 have stated publicly that metering is the fairest way to pay for water. All stakeholders agree—subject to differences in commitment in terms of timescale, and the framework of protection for vulnerable groups which would need to be in place alongside such a move. The Walker Review was set up to advise government on how a move to full metering could be taken forward, but did not give a final date by which it would like to see this in its Interim Report. The Mayor of London, Boris Johnson, has in recent weeks committed to a water meter in every house in London by 2015, and every block of flats by 2020. Ofwat's draft determinations will provide for metering to move to levels of 47% by 2015, and 56% in areas of serious water stress. However, *Waterwise would like to see a water meter in every home in England and Wales by 2020 (subject to the protections referred to above being in place), and to this end would like to see a clear political commitment from the government to full metering in that timescale, which we believe the water industry would then deliver.*

15. Social housing retrofitting projects which Waterwise has carried out in partnership with water companies, social housing providers and others, have shown significant water savings, with a positive cost-benefit attached. They have also resulted in social benefits—for example the installation of showers in homes which had only ever had baths. The Decent Homes standard does not currently require showers—*Waterwise would like to see water efficiency included in the updated Decent Homes standard, including the installation of showers that are both water-efficient and energy-efficient.*

16. Water neutrality requires water efficiency retrofitting measures in schools, hospitals and businesses in the same area as new housing development, so total water demand does not increase. Water neutrality is beginning to be taken forward as a concept in the UK, and the government has committed in part to applying it in some of the growth housing areas in water-stressed areas. *Waterwise would like to see water neutrality applied as a standard planning tool across the country, including beyond areas which are currently designated as "water-stressed"—as there is no guarantee that areas not currently water-stressed will remain so in future.*

17. Both Ofwat and the water companies have made considerable strides towards large-scale water efficiency in recent years, and the draft determinations for PR09 published in July 2009 included funding for six enhanced water efficiency programmes, which Waterwise welcomes. Five years ago a handful of water companies were carrying out water efficiency retrofit projects of more than 500 homes: now many of them have plans to retrofit 10,000 homes in each of the next five years. However, the investment in these programmes is still a drop in the ocean compared to that in large-scale supply-side projects such as reservoirs and desalination plants, which in themselves are vulnerable to climate change. This is to a large extent because the regulatory framework surrounding the water industry is still biased towards capital expenditure, which counts against water efficiency. This year, the Cave and Walker Reviews (on Competition and innovation in water markets, and Charging for household water and sewerage services, respectively) and the recent EFRA Select Committee report on Ofwat's 2009 Price Review have recommended a *refocusing of this*

regulatory framework, to put resource efficiency at its centre. Waterwise fully supports this, which would significantly improve the prospects for robust Adaptation Reports from Ofwat and the water companies, and of the national Adaptation Programme as a whole.

WATER EFFICIENCY IN BUSINESS—AND THE ADAPTATION REPORTING POWER

18. Organisations could save 40% of their water use through simple measures such as fixing leaks (after identifying these through meters) and switching to technologies such as urinals, toilets, taps and showers which use considerably less water. It is not unheard of for a disconnected pipe or forgotten dripping (or fully on) shower to be wasting huge amounts of water. Making the processes (industrial and manufacturing, and “domestic”, such as cooking, cleaning and toilet facilities in workplaces) of an organisation more water-efficient would also save money on water bills. *Water audits carried out as part of a wider water-use strategy should be one of the first steps an organisation should take in its adaptation plans. We would like to see this specified in the directions for the Adaptation Reporting Power, for inclusion in the Reports. We also propose a revolving, spend-to-save fund to help businesses waste less water.*

19. Several of the major energy sources in the UK’s future low-carbon energy mix rely greatly on water availability—namely, nuclear, and carbon capture and storage. *This needs to be factored into the Adaptation Reports from those sectors.*

20. Waterwise agrees that food, schools and housing should all be invited to report. The food sector is extremely reliant on water availability, and water efficient practices are not yet embedded in the supply chain—although the food industry does now have a collective water efficiency target. *Schools and housing are two sectors in which wasting less water, through easy fixes, in partnership with water companies and others, could ensure adaptation was carried out in the most efficient way.*

DRIVING THE MARKET IN WATER EFFICIENT PRODUCTS

21. Waterwise works closely with retailers (such as B&Q) and manufacturers (such as Procter and Gamble—Ariel) to drive water efficient behaviour and purchasing decisions. We award the Waterwise marque to water-efficient products, and have worked with the Bathroom Manufacturers Association on the development of their water efficiency label. However, as recent Select Committee reports have pointed out, and the Walker Review’s Interim Report also identifies, there is a need for a single source of information—Walker recommends that government work with Waterwise and others to review the existing water efficiency labels and consider and develop the case for a mandatory, cross-sector label. Waterwise is already working to this end with the relevant sectors. *We would like to see a government commitment to the Walker Review’s interim recommendation. In addition, to drive the market in water efficient products, we would like to see fiscal incentives on water-efficient products (these are being pursued at EU level by the UK for energy-efficient products, but not water-efficient ones). Finally, there is a clear need for strict water-efficiency products standards beyond those which exist for toilets, across other ranges such as taps, showers, washing machines and dishwashers, with these standards being regularly reviewed. These could be developed and put in place by government, working with NGOs, retailers and manufacturers—some of whom are already developing their own water efficiency product standards.*

WATER EFFICIENCY OPPORTUNITIES IN GOVERNMENT MITIGATION STRATEGIES

22. Government policies, strategies, targets and funds to develop the low-carbon economy tend not to include water efficiency. Water efficiency could represent a significant sector in the low-carbon economy—through developing both skilled jobs in the services sector (for example to support the government scheme to retrofit every home by 2030, if this included energy and water efficiency), and the UK manufacturing base in water-efficient products. *We recommend that the ACC programme undertake an audit of government mitigation policies, including those to develop the low-carbon economy, in the context of the potential contribution of water efficiency—this will help meet both mitigation and adaptation needs.*

WATER EFFICIENCY IN GOVERNMENT DEPARTMENTS

23. We note that the adaptation plans of some government departments are more advanced than others, and we accept the reasons given for this. However, we are concerned to see that some departments consider only the flooding risks relating to adaptation, with no regard to water scarcity, which could have a major impact on all government (and economic) processes and programmes. *We would like Defra to require all government departments’ adaptation strategies to include a water audit and water efficiency strategy—we are certain that this would lead to significant water (and cost) savings in every department. Such a programme would include the updating of service contracts as our work with some government departments has illustrated that in some cases a service contract can sit in the way of water efficiency. We also note the significant potential of government procurement in driving the market in water-efficient products, and we would like to see mandatory government procurement standards which reflect the best-available technologies (not the average) currently available on the UK market, with these being regularly reviewed and updated. We also propose a revolving, spend-to-save fund to help public sector buildings waste less water.*

24. We note in the NAO report for the Select Committee the observation that partnership working will be essential in meeting adaptation goals. Waterwise believes that partnership working can deliver the best cost-benefit result in terms of retrofitting and policy development. *We would like to see greater inclusion of NGOs in the development of adaptation policies and programmes.* We also agree that the development of local and regional adaptation plans is essential, and welcome the emphasis on this in the ACC's work.

BUILDING THE EVIDENCE BASE

25. We note that two of the key elements of the ACC's work are to "develop a more robust and comprehensive evidence base about the impacts and consequences of climate change on the UK", and "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". Waterwise produced (in October 2008), for the UK Environment Minister's Water Saving Group (on which we were the only NGO to sit, alongside the water industry, its regulators, the Consumer Council for Water, and CLG), the Evidence Base for Large-scale Water Efficiency in Homes. This economic analysis drew together for the first time around 20 large-scale water efficiency programmes being undertaken by UK water companies, producing cost-benefit analysis for individual water efficiency measures on a large scale, and for scenarios for delivering them (for example in partnership with an energy company). The Evidence Base was warmly welcomed by the Water Saving Group, which requested that it be kept updated. The Evidence Base has been used by water companies and regulators during the 2009 Price Review and the Water Resource Management Plan process. It is currently being updated and improved, with the inclusion of additional, larger projects, and the attachment of carbon values to individual water efficiency measures. *The Evidence Base will be highly relevant to the ACC's work.*

3 October 2009

Memorandum submitted by Chartered Institution of Water and Environmental Management (CIWEM)

The Chartered Institution of Water and Environmental Management (CIWEM) is the leading professional and qualifying body for those who are responsible for the stewardship of environmental assets. The Institution provides independent comment, within a multi-disciplinary framework, on the wide range of issues related to water and environmental management and sustainable development.

1. CIWEM welcomes the added focus on adaptation within the climate change agenda and believes that capacity building within the Government is a necessary step to integrate climate change risks into decision making. Whilst mitigation potentially allows for more words than action, especially in the context of a political term, adaptation requires early adoption and commitment from the outset. Adaptation and mitigation both need to be addressed in equal measure with funding allocated in the present.

2. Within Government, climate change is clearly a cross-departmental issue but we would suggest that climate change as a threat needs to receive more attention. As Sir David King commented in 2004: "climate change is the most severe threat we are facing today". There is a need to elevate climate change to a higher priority, similar to that of terrorism, with a senior figure appropriated with the ability to call for action across all departments when required. The fragmentation of climate change impacts and implications across several, if not all, Government departments and the lack of a "champion who has cross-departmental power means that delivery of firm action across Government is difficult.

3. There is a great concern that throughout the Adapting to Climate Change programme, the Government is following an "anthropocentric" position and as such is failing to address key issues. Despite all of our technology we depend upon the services provided by our natural environment and in particular those provided from biological diversity. Our efforts should at least consider what we need to do to protect these services from the effects of climate change.

4. Adaptation to climate change in the UK is hindered by a lack of support for innovation. Recent announcements by the Government are unlikely to change this situation. In the water industry especially, the current price-and-asset-driven regulatory system works firmly against innovation and the same regulation pays minimal attention to technologies that are climate resilient and sustainable.

5. In order to adapt to climate change, there is a fundamental challenge within the water industry and water management in general. Water management is extremely fragmented and is not integrated; this is counter to the Water Framework, which is the guiding directive in this area. At present, flood risk management tends to involve accelerating water through the catchment rather than innovative approaches to storage; this then exacerbates water shortages. If well established techniques (such as wetland creation, winter storage of water, increased permeability of surfaces, storage areas, forestry and riparian trees), were utilised in a more wide ranging way for all catchments (including urban catchments) we would adapt to climate change through lower run-off in extreme rainfall periods and more effective storage of water for dry periods.

6. With regard to investment in flood risk management assisting with adaptation to climate change, measures in the forthcoming Flood and Water Management Bill are welcomed by CIWEM. However there is concern that local authorities do not have the capacity in terms of staffing and expertise to deliver local flood risk management. Funding allocated to date is enough to deliver some of the required surface water management plans, but there appears to be little likelihood that significant and ongoing funding to deliver the full measures within the Bill will be provided. CIWEM has offered to develop with partners a package of capacity building support to local authorities and local stakeholders which would include local champions, a nation-wide advisory service, local forums and training packages, but calls for funding have been left unanswered.

7. In terms of house building, moves to develop more “sustainable” and resource efficient homes are gathering pace, but this pace is not fast enough. In Australia, severe drought has led to strong action by Government in terms of changing markets for water efficient devices so that new industry and innovation has been encouraged and less efficient devices are forced off the market. This requires a more active Government role, rather than the fairly passive approach taken in the UK.

8. CIWEM is concerned that the current programme of Regional Spatial Strategies does not allow for development that takes account of the risks from climate change. Households, businesses, infrastructure and public services will all need to be prepared, yet proposing new house building strategies in resource stressed areas will undermine adaptive actions and not allow for those most vulnerable in society to adapt.

9. CIWEM believes that there should be more focus on building resilience, especially in areas vulnerable to flooding. There is considerable inertia from the insurance industry to offer that damaged property is rebuilt in a more resilient way. The Government needs to encourage the insurance sector to replace the “like for like” approach at the lowest cost with a system where resilient materials and refurbishment is expected in certain areas at risk of repeat flooding.

10. As most of the impacts of climate change will occur outside of our borders an international perspective is required. DFID have commissioned studies to look at the impact of climate change on existing technologies in relation to water and sanitation in low income countries. Initial findings suggest that the transfer of solutions can play a larger role in assisting adaptation rather than the development of new technologies. At a local level this requires capacity building for a more flexible and knowledgeable profession through research, management systems and training.

11. Public engagement in climate change issues is very weak. There needs to be increased engagement and a significant programme of educational measures by Government so that there is a deeper understanding of climate change issues. The level of funding required for a significant mass media campaign in climate change is way beyond the sums allocated to “Act on CO₂” and other recent campaigns.

5 October 2009

Memorandum submitted by the Royal Society for the Protection of Birds (RSPB)

INTRODUCTION

- Climate change is the greatest threat facing the planet, and is already affecting wildlife.¹⁹ Moreover, climate change is compounding existing threats to wildlife such as habitat destruction, pollution and non-native invasive species.
- There is evidence to suggest that the rate and destination of further climate change during this century could be without precedent during the evolutionary history of most species on the planet,²⁰ and that further impacts on wildlife will be enormous.
- As champions of the natural environment, and biodiversity in particular, the RSPB believe it is essential that through adaptation planning and action:
 - The role a healthy natural environment will play in supporting the adaptation of society and the economy through the provision of vital ecosystem services is recognised.
 - The natural environment is recognised as a sector in its own right that will not adequately adapt autonomously.
 - All sectors ensure their adaptation does not restrict the ability of the natural environment to adapt, and where possible, seek to support its adaptation.
 - Ecosystem-based adaptation solutions are considered as a priority adaptation response by all sectors.

¹⁹ Hopkins *et al* (2007). *Conserving biodiversity in a changing climate: guidance on building capacity to adapt*. Published by Defra on behalf of the UK Biodiversity Partnership.

²⁰ Huntley, B 2007. *Climatic change and the conservation of European biodiversity: Towards the development of adaptation strategies*. Discussion paper produced for the Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats.

- To support wildlife’s adaptation to climate change, it is widely accepted that we must both build resilience (eg by removing non-climate impacts and managing our existing wildlife sites and protected areas), and accommodate change (eg by creating new habitat and supporting wildlife-friendly management of the wider countryside).

RESPONSE TO ISSUES HIGHLIGHTED BY THE COMMITTEE

1. *The RSPB fully supports the Adaptation to Climate Change Programme*, and believe it is working well to embed adaptation and climate change risk assessment into the work of Government departments.

2. *Based on the report by the National Audit Office, we believe that Government departments have done a good job of identifying which strategic objectives are likely to be significantly affected by the impacts of climate change.* We particularly welcome the recognition of the vulnerability of the natural environment to the impacts of climate change, and the desire to address this, in so many Departmental Assessments. We look forward to seeing more detail on how this can be achieved in the Departmental Adaptation Plans when they are published in spring 2010.

3. *The Departmental self-assessments show that good progress is being made toward the vital first step of building awareness of climate impacts and the need for adaptation.* Once different departments have produced their adaptation plans, it will be important that the Adapting to Climate Change team at Defra, in their role as a cross-government facilitator, start to consider where different departments should converge their adaptation planning, and look for co-benefit adaptation solutions that are cost and resource- efficient.

4. *The RSPB recently responded to Defra’s consultation on the Adaptation Reporting Power.* We broadly welcomed the proposed strategy for using the Reporting Power, though we believe the Adaptation Sub-Committee need to play an earlier role in scrutinising the reports, that the natural environment needed greater prioritisation, and that there needs to be greater emphasis on the value of Reporting Authorities working to integrate their adaptation planning where appropriate. We felt the draft Statutory Guidance did not adequately establish the need for all sectors to contribute to the adaptation of the natural environment.

5. *Action to conserve current biodiversity, and remove non-climate pressures on the natural environment, is urgently needed.* This is widely recognised as a vital short-term priority for enabling the natural environment’s adaptation to climate change.²¹ Following the recognition by so many departments that the natural environment is a key objective likely to be significantly affected by climate change, we look forward to seeing how these short-term priorities will be actioned and funded through departmental adaptation plans. Investment in the natural environment is fundamental to society’s adaptation—and immediate action is vital as tomorrow’s biodiversity can only come from today’s.

6. *Capacity to adapt to climate change is rapidly increasing across government, but it has a long way to go.* The challenge is to embed adaptation into everyday decision-making whilst ensuring it remains a high profile responsibility. We suspect that some of the greatest capacity challenges lie at a local government level—particularly when this relates to Local Authorities’ responsibilities for cross-sectoral adaptation (eg reducing flood risk and benefiting biodiversity through land management).

7. *The private and third sectors lie outside of the scope of the UK Climate Change Act.* Yet these sectors provide vital goods and services that we must ensure are robust to the challenge of climate change. With over 75% of land in the UK being used for agriculture, sustainable adaptation in the agricultural sector that contributes to wider society’s adaptation is of the utmost importance. Defra and Natural England are already making valuable contributions to the evidence base for this, but there is much more work to do, not least in communicating to farmers, land managers and their advisors.

8. *The Adapting to Climate Change team in Defra have done a good job of raising awareness across government and providing an evidence base to all their stakeholders* (particularly through the roll-out of UK Climate Projections 09). As stated above, their cross-governmental role will be of particular value once Departmental adaptation plans are launched, and key areas for convergent planning can be identified. Communication with business is extremely important (as highlighted above), and this will be an important role for the Adaptation Sub-Committee.

9. *The RSPB fully support the recognition that adaptation must contribute to the principles of sustainable development* and we look forward to seeing this concept embedded in both the Statutory Guidance, and the National Adaptation Programme (as required by the UK Climate Change Act). Where sustainable development frameworks are successful in embedding the principles of sustainable development into decision-making across a government department or organisation, then this framework would seem to be a sensible vehicle for embedding adaptation. Where this is not the case, it will be important to improve the performance of existing sustainable development frameworks, perhaps using the urgency of climate change as a catalyst, alongside embedding adaptation.

10. *The RSPB is working to ensure its conservation efforts support wildlife’s adaptation to climate change.* Bitterns, a priority species for conservation in the UK, are under particular threat from climate change, because so many of their stronghold sites are freshwater habitats at the coast. Coastal squeeze, exacerbated by climate change, is putting these sites under significant pressure. For many years we have been planning

²¹ Hopkins *et al* (2007). *Conserving biodiversity in a changing climate: guidance on building capacity to adapt*. Published by Defra on behalf of the UK Biodiversity Partnership.

ahead to accommodate the likely future loss of these key sites with the support of many partners, including Natural England and the Environment Agency. By creating sufficient habitat inland, for example our Lakenheath reserve in Suffolk, ahead of the loss of the core coastal sites, we hope to secure the long-term future of bitterns in the UK.

5 October 2009

Memorandum submitted by Landscape Institute

INTRODUCTION

The Landscape Institute is an educational charity and chartered body responsible for protecting, conserving and enhancing the natural and built environment for the benefit of the public. It champions sustainable, well-designed and well-managed urban and rural environments. The Institute's university accreditation and professional procedures ensure that the designers, managers and scientists who make up the landscape profession work to the highest standards. There are 6,000 professional members working across both the public and private sectors, both within the UK and elsewhere across the world. Our advocacy and education programme promote the landscape profession as one which focuses on design, environment and community in order to inspire great places where people want to live, work and visit.

SUMMARY

Our response to the EAC inquiry centres on the significant role of green infrastructure, its vital contributions to the environment, society and the economy and its potential to deliver climate change resilience whilst at the same time being vulnerable to climate change itself. Our main points are summarised as follows:

1. *Whether short-term priorities for action, including identifying and protecting infrastructure and systems (for example, power, food, water, transport, defence and security) have been identified and how these are, or might be, addressed.*

- The Government has failed to recognise the vital importance of green infrastructure in the delivery of essential services upon which daily life in the UK depends.
- This view is based on our assessment of the recent Defra draft strategy outlining the implementation and use of Government's Adaptation Reporting Power.

2. *The funding, support, training and other resources available, including at a local and regional level, for:*

- *building capacity to adapt to climate change;*
- *specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure; and*
- *helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take.*
 - At present there is a lack of integration in strategic and mainstream planning which inhibits the creation of climate resilient development and adaptation generally.
 - Previous Government initiatives which could have demonstrated how to overcome this, such as the Ecotowns Planning Policy Statement, have failed to grasp the complexity of green infrastructure and its broad range of climate change related functions.
 - In order to maximise the adaptation potential of green infrastructure, it needs to be planned early in the development process and in a way which takes account of the various characteristics which contribute to making a place unique.
 - Legislative boundaries must not become constraining factors in the delivery of green infrastructure.
 - The ongoing maintenance and management of green infrastructure, and thereby its continued integrity is critical in ensuring it delivers against climate change objectives, in addition to a wide range of other benefits.

1. *Whether short-term priorities for action, including identifying and protecting infrastructure and systems (for example, power, food, water, transport, defence and security) have been identified and how these are, or might be, addressed.*

1.1 The Landscape Institute's publication *Green Infrastructure: connected and multifunctional landscapes (2009)* defines GI as:

“... the network of green spaces and other natural elements, such as soils, rivers and lakes, which are found within and between our villages, towns and cities. These elements are individually known as GI assets and, when planned, designed and managed appropriately, can perform a vast array of vital functions which are critical to our quality of life”.

1.2 The Landscape Institute considers green infrastructure should be included and specifically mentioned in the definition of infrastructure systems for the reasons set out below.

1.3 The Landscape Institute is deeply concerned by the current failure of Government to appreciate fully the importance of taking action which identifies, protects and enhances the nation's GI. This failure became apparent in Defra's recent consultation, *Adapting to climate change: ensuring progress in key sectors (2009)*. The consultation document set out the Government's intended use and application of the Reporting Power, one of the key components of its Adapting to Climate Change Programme. Fundamental to this strategy is the way in which priority reporting authorities have been selected.

1.4 Defra has stated in the consultation document that the Centre for the Protection of National Infrastructure definition of National Infrastructure is the starting point in the identification of those authorities it will be directing to report as a matter of priority. This definition describes National Infrastructure as:

“... those facilities, systems, sites and networks necessary for the functioning of the country and the delivery of the essential services upon which daily life in the UK depends. There are eight categories of National Infrastructure: emergency, energy, finance, food, government, electronic communications, transport and water”.

Using this definition, Defra has then ascertained which organisations are responsible for the investment in, and maintenance/management of, key infrastructure.

1.5 It is this definition, and its application, which is of fundamental concern. This is because it fails to recognise the vital role of GI in the delivery of a vast array of services essential to daily life, such as:

- Biodiversity enhancement, corridors, linkages and stable ecosystems.
- Formal and informal recreation.
- Research and experiential educational.
- Healthy living opportunities.
- Economic development, innovation and entrepreneurship required to meet the challenges of sustainability, including enhanced economic values.
- Sustainable and low-carbon food production systems.
- Renewable energy sources.
- Water management, clean drinking water and water storage.
- Provision of oxygen and the capture and storage of carbon.
- Reconnecting people to the natural environment.
- Food production.

The combination of increases in global population, changes in climate and declining availability of fossil fuels will soon place a special emphasis on harnessing the power of the sun through natural systems. Intensive systems, dependent on unsustainable use of non-renewable resources, must give way to extensive systems. However, the combination of this change and pressures on levels of production will require the declining land area to become multifunctional, where vegetated soil becomes priceless.

1.6 The multifunctional nature of GI is underpinned by ecosystem services, a concept which can be broadly broken down as follows:

- Support—necessary for all other ecosystem services, such as soil formation and photosynthesis.
- Provision—providing goods, such as food, fibre and fuel.
- Regulation—examples include air quality, climate and erosion control.
- Culture—including non-material benefits, such as aesthetic qualities and recreational opportunities.

1.7 These ecosystem services, which are fundamental to GI, actually assist in both adapting to climate change and manipulating micro-climate, including:

- Improving air quality, which has been shown to deteriorate as temperatures increase.
- Reducing the impact on health and wellbeing in the face of higher temperatures.

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- Reducing surface run-off in the face of more intense rainfall, thereby relieving pressure on drainage systems.
 - Providing temporary flood storage and aiding response to sea-level rises.
 - Protecting building integrity.
 - Providing “green” transport routes.
 - Reducing the severity of the urban heat island (UHI) effect.

1.8 Defra itself has previously recognised the vital importance of ecosystem services in its own publication, *An introductory guide to valuing ecosystem services (2007)*, which states that:

“Environmental assets—like other assets—provide benefits that enhance economic performance, offer new opportunities for investment and employment, and improve living standards and quality of life”.

Furthermore, this publication goes on to say that one of the central themes of Defra’s work on the subject is:

“... to ensure that the true value of ecosystem services and the services provided are taken into account in policy decision-making”.

In addition to this, Defra’s *Adapting to Climate Change in England—A Framework for Action (2008)*, states that:

“... the natural environment too needs our particular attention, to enable our wildlife and countryside to adapt and because innovative approaches to managing our natural environment can be part of our adaptation”.

1.9 It can be seen that Defra has made previous commitments to ensure that ecosystem services are taken into account appropriately in the policy making process, and that the Department recognises the importance not only of ensuring that the natural environment is resilient to climate change, but also of incorporating it into approaches to adaptation. It is unfortunate, and of great concern to the Landscape Institute, that these commitments have not been reflected adequately in the Government’s current adaptation plans.

1.10 The Landscape Institute argues that GI must be considered as important a priority alongside other infrastructure, not only for its contributions towards our quality of life via ecosystem services but also in recognition of its role in adaptation to “locked-in” climate change itself. It is also important to note the potential of GI to assist in mitigating future climate change through such mechanisms as carbon sequestration. Such is the importance of GI that ensuring its resilience to climate change is essential. Furthermore, the resilience of property, food and timber suppliers, transport and power infrastructure and the human need for recreation and reflection in the outdoor environment all depend on maintaining resilient natural environment systems. Defra are rightly promoting soil conservation strategies, catchment water management plans and water/air quality management planning. These all inter-relate and we suggest that these could be brigaded together in a national resilience strategy for the protection and management of GI.

1.11 GI helps us live within environmental limits, especially in respect of climate-proofing. A healthy GI is able to buffer against climatic extremes; healthy and well-vegetated soils can absorb carbon and slow the rate of storm water infiltration. Locally-produced food and energy can reduce carbon footprints and “food-miles”. Shady streets and buildings can provide refuge from the urban heat-island effect. Robust, diverse and large green spaces can allow niches for the survival and dispersal of flora and fauna, which might otherwise be pushed to localised extinction if exposed to climatic extremes. Contact with the environment stimulates a necessary sense of responsibility towards its long-term protection.

1.12 The Landscape Institute strongly believes that the omission of GI as “critical National Infrastructure” means that Government has failed to identify short-term priorities for action as set out in its proposed strategy for use of the Adaptation Reporting Power. The Landscape Institute recommends that Government revisit its process for identifying “National Infrastructure” and that GI is included in a revised definition. This will then allow Government to identify those organisations responsible for investment in, and management and maintenance of, GI and subsequently help ensure its resilience in the face of future climate change, safeguarding the range of vital ecosystem services it proves.

2. *The funding, support, training and other resources available, including at a local and regional level, for:*

- *building capacity to adapt to climate change;*
- *specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure; and*
- *helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need to take.*

2.1 At present there is a lack of integration in strategic and mainstream planning's approach to creating climate resilient development and to adaptation generally. A multi-disciplinary approach is essential, as is awareness-raising and capacity-building based on international experience.

2.2 An approach to land use planning which views the environment more strategically is essential in supporting adaptation at national, regional and local levels. The Landscape Institute is aware that the Department for Communities and Local Government (DCLG) is currently drafting a Planning Policy Statement (PPS) on the subject of GI. This commitment was announced in May this year at the launch of World Class Places, a joint DCLG and Department for Culture, Media and Sport (DCMS) strategy for improving quality of place. The Landscape Institute wholeheartedly supports this commitment, as a PPS is an essential resource providing guidance to local authorities on a range of issues and their relation to the planning system. A GI PPS, if executed properly, would enable local authorities to build their capacity to adapt to climate change, given the inherent adaptation quality of GI itself.

2.3 However, while the draft GI PPS is yet to be released for consultation, the Landscape Institute is concerned at the Government's apparent misunderstanding of the concept to date, as was demonstrated in its July 2009 Ecotowns PPS. The Landscape Institute was encouraged by DCLG's inclusion of GI within the PPS, and its commitment that at least 40% of an ecotown's area should be dedicated to green space. However, GI is more than green space—the PPS fails to recognise the importance of planning and designing GI at the earliest stage in the development process in order to make optimum use of the land. It failed to recognise that GI is an overarching approach to land use planning which can enable other standards, such as biodiversity, flood risk management and food production, to be realised. GI is not an “add-on”, as it is presented in the Ecotowns PPS. GI should provide the context within which other infrastructure and land use takes place.

2.4 It is only through early GI planning that local characteristics such as climate, geology, topography, biodiversity and drainage can be considered sufficiently to ensure that truly multifunctional use of limited land supply can be realised. The Landscape Institute believes that any future PPS on GI must fully acknowledge the critical role of planning for GI early, alongside more conventional infrastructure components such as highways, telecommunications and drainage systems. This will provide a critical resource for local authorities to develop and implement GI strategies, thereby maintaining and enhancing the ecosystem services it provides in addition to ensuring resilience to “locked-in” climate change.

2.5 The scale at which GI planning takes place is important. A hierarchy of associated approaches is essential. In general, the sub-regional scale is appropriate for a GI strategy. This should be underpinned by a regional approach which establishes climate-proofing principles. In planning GI's potential for providing resilience and adaptation to climate change, legislative boundaries should not become constraining factors. Local planning authorities and regional agencies will need to discuss these matters with their neighbours. The potential for, for example, regional parks and community forests to transcend authority boundaries gives them an important role in delivering climate change adaptation.

2.6 It is essential that new development and regeneration is considered in a holistic way with its environs. The Landscape Institute views this as a “landscape renaissance” where the necessary consideration of energy production and use, water use/re-use, waste disposal and management, transport connections, open space provision and use are all essential components of any development. As such, the links to, and design and management of, a development's hinterland is as crucial as the building component. At the “building footprint” level, there is much research and evidence of how choice of materials, aspect, energy-saving measures will cut greenhouse gas emissions. However, at the neighbourhood and district level there are less obvious means to plan and ensure existing and proposed developments are climate-proofed and there is a greater need to consider environs and their functions. This is where a functional approach to GI can play a significant part in planning for developments to reduce human discomfort and energy demands, to make provision for flood management whilst also considering local distinctiveness, biodiversity, linkages and corridors, recreation and health and community needs.

2.7 With increasing pressures on land, our survival depends both on understanding and making optimum use of this finite resource. Land should be multifunctional unless there are powerful reasons for it not being so. Therefore, whilst allocating land for a limited number of “uses” may be necessary for the efficient functioning of a planning system, a broader analytical approach, with an understanding of the functions an area should provide, needs to be at the heart of any GI plan.

2.8 The management and maintenance of GI is a significant issue; inadequate long-term investment means that the critical ecosystem services delivered through GI are less likely to be realised and/or deteriorate over time. This in turn leads to a lack of appreciation of the vast potential that these assets have to offer, with a subsequent lack of investment in the future. To overcome this requires a planning system which is more realistic in its assessment of long-term management and maintenance needs based upon original strategies.

Memorandum submitted by EDF Energy

1. EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. Our interests include nuclear, renewables, coal and gas-fired electricity generation, combined heat and power, electricity networks and energy supply to end users. We have over 5 million electricity and gas customer accounts in the UK, including both residential and business users. We welcome the opportunity to respond to the EAC Inquiry—Adapting to climate change.

EDF ENERGY—KEY POINTS

- EDF Energy supports the Governments actions to mitigate Climate Change, and also recognises the need for adaptation measures as our understanding of the unavoidable impacts of climate change becomes more certain.
- The Power Sector already carries out significant reporting under current regulations and provides significant information on the sector under the Government's established reporting regimes. There needs to be compelling arguments to justify the provision of additional information.
- EDF Energy believes it would be more appropriate to review the adaptation strategy for electricity supply at a sectoral level rather than targeting individual operators.

EDF ENERGY INPUT TO THE EAC INQUIRY ON CLIMATE CHANGE ADAPTATION

Background

2. We are pleased to see Government taking an active role in adapting to climate change. We present here some views on Climate Change Adaptation as they appear to an operator of large infrastructure assets and networks within the UK.

On Adaptation Reporting

3. The power sector already undertakes significant reporting under current regulations and provides significant information on the sector under the Government's established reporting regimes. This includes being Category 2 responders under the Civil Contingencies Act 2004, membership of the Energy Emergency Executive Committee (E3C) and the Critical Infrastructure Resilience Programme (CIRP). There needs to be compelling arguments to justify the provision of additional information.

4. Climate change adaptation is a much broader issue than mitigation and affects a much wider and more diverse stakeholder group. This of course necessitates the involvement of a number of Government departments in order to best represent the interests of these stakeholder groups. While gathering views from all groups is important, it should be recognised that some organisations will be engaged in a variety of forums and care should be taken to avoid duplication of reporting efforts.

5. Industry regularly provides information to a wide range of Government departments on climate change related issues and environmental issues. A cohesive approach is required from these departments to ensure that this information is collated and used in the best possible way.

6. We believe it would be more appropriate to review the adaptation strategy for electricity supply at a sectoral level rather than targeting individual operators, given the national strategic importance of electricity infrastructure. This would also make best use of existing reporting arrangements and avoid an unnecessary additional administrative burden on operators.

7. In the case of the UK power sector the Government needs to recognise that the vast majority of current power station assets will no longer be operational in 25 years time. In this context Government should consider placing any site specific adaptation reporting requirements on new installations and then only through the Environmental Impact Assessment and Planning processes.

8. Should Government wish to include the power sector within the Adaptation Reporting power initiative then we believe the following key points should be considered:

- EDF Energy already carries out a wide range of activities in relation to climate change;
- it is necessary for Government to define a clear objective of the reporting power, one that genuinely adds value to the reporting needs in respect of climate change issues;
- EDF Energy supports a phased approach to the introduction of the adaptation reporting power with major new infrastructure reporting first;
- EDF Energy believes that any reporting should be on a sectoral basis in the first instance;
- any reporting carried out should reflect the level of detail that can be provided on the impacts of climate change, and at this stage we believe that this should be relatively "light touch";

- we believe that the reporting authorities will need a harmonised approach to reporting for the adaptation reports to be of benefit to Government. We believe that the Guidance needs to be reviewed to reflect this; and
- Government needs to manage expectations around what can be delivered as experience with climate change mitigation shows that it takes time for requisite skills development and capacity building.

On the Adapting to Climate Change Programme

9. EDF Energy agrees with the statements made in Governments *Adapting to Climate Change in England* report and in the Stern report that Government's role in relation to Climate Change Adaptation should be one of facilitation. This should involve ensuring that adequate resources and information are available to organisations to allow them to make informed decisions regarding the protection of their assets.

10. We do not believe that it is appropriate for each Devolved Administration to be producing a separate Adaptation programme. As an organisation operating assets within different administrations we are concerned about contradictory regulation. This is an area in which common approaches to reporting and adaptation need to be developed.

11. We agree with the Government's observation within the Adapting to Climate Change Programme that a different approach will be required for large long-lived new infrastructure. That is why we propose that any reporting on this infrastructure is carried out in line with the current planning process.

12. Organisations operating large infrastructure assets have it in their own interest to protect these assets. Therefore they should be allowed to proceed with their own activities to protect the assets with support from Government.

13. EDF Energy has been involved in a number of initiatives to understand the impact of climate change on our assets. EDF Energy, along with National Grid and E.On UK, worked with the Met Office in 2006 to produce a scoping study on the impacts of climate change on the UK electricity industry and, as a part of a broader group of participants, has also commissioned a further study, "Impact of Climate Change on the UK Energy Industry", to develop practical responses to Climate Change.

14. Additionally our subsidiary that operates our nuclear plant in the UK, British Energy, completed a series of studies in order to inform ourselves and our stakeholders on the impacts of climate change on our coastally located nuclear power stations.

- (a) A report from the Met Office summarises the kinds of effects that may be expected at each of our power station sites (temperature, precipitation, wind and coastal factors).²²
- (b) Two reports for the public that outline the potential impacts of climate change that British Energy faces at our sites²³ and a note to inform the public of impacts of climate change on replacement nuclear build.²⁴ These reports provide confirmation that we are currently operating our plants in the safest possible manner.

15. We also support the Government's observations on the development of skills and resources to deal with Climate Change Adaptation. As noted earlier the development of these skills across the economy will take some time and Government needs to manage these expectations.

5 October 2009

Memorandum submitted by England's Regional Development Agencies

INTRODUCTION

The East of England Development Agency are responding on behalf of the RDA network in light of our lead role on Defra issues.

This response also highlights the range of work that RDAs are undertaking on the climate change adaptation agenda (see Annex 1 attached)²⁵ and also sets out examples of RDA work on a low carbon economy and business and development (including retrofitting) (see Annex 2 below),²⁶ for your information.

²² <http://www.british-energy.com/pagetemplate.php?pid=354>

²³ http://www.british-energy.com/documents/Climate_Change_and_replacement_nuclear_build.pdf

²⁴ http://www.british-energy.com/documents/Climate_Change_and_replacement_nuclear_build.pdf

²⁵ Not printed.

²⁶ Not printed.

ROLE OF THE RDAs

1. As experts on our regional economies, the RDAs recognise the importance of preparing for the resilient implications as well as the business opportunities that climate change will bring. For many years, The RDAs have been working hard with our national and regional partners on tackling climate change and would emphasise the importance of having a regional overview of climate change adaptation activity. The RDAs are currently working with Government on the *New Industry New Jobs agenda* helping to identify and prepare for greater investment in emerging sectors (including low-carbon buildings) to drive the economy out of recession.

2. The RDAs have 10 years experience of developing regional strategies and believe that the single regional strategies should be the main strategy for addressing climate change adaptation. For example, Yorkshire Forward and Local Government for Yorkshire and Humber are currently taking joint responsibility for the development of the region's *Integrated Regional Strategy (IRS)* where climate change adaptation is being addressed within the Climate Change and Environmental Resources work stream.

3. All RDAs undertake a variety of activities. These include supporting and working with regional climate change partnerships; developing innovative research and regional intelligence; regenerating places with sustainable design and construction at the core; linking researchers with businesses to develop new products; supporting businesses to develop innovative technologies to help with climate change adaptation (CCA); and ensuring businesses receive the right support to help them adapt to new risks and threats.

WHAT RDAs NEED FROM GOVERNMENT

4. RDAs welcome the inclusion of a strong regional dimension to the national *Climate Change Risk Assessment* and are working very closely with Defra on this. By building on the findings of the UK Climate Projections and regional work that has already been undertaken, this work will provide us with valuable evidence that can be used to make further progress at both the regional and national levels.

5. Support and training will be a key influence on how well businesses engage with adaptation. The current Defra-led Projections in Practice events being held in each region are already highlighting that more attention needs to be given to training and capacity building for key professions.

6. In our view, climate change adaptation issues are still dominated by terminology which does little to engage people and communicate the key messages. In addition, the probabilistic projections need to become more user-friendly to help improve understanding and facilitate action.

7. More effective communication across businesses is also needed. A useful approach to consider, for example, could be for some of the larger and more aware businesses to help engage SMEs. Increased emphasis and support that would enable businesses to assist each other is likely to be more productive than Government/Local Government telling businesses how and why to adapt. As the RDAs play a key role in delivering business support, we would welcome further discussions to help address this issue.

5 October 2009

Memorandum submitted by the Wildlife Trusts

KEY POINTS

- Consideration of the natural environment, its ability to adapt to climate change and the potential additional benefits of taking a landscape scale approach to nature conservation should have a higher priority in Government thinking.
- There are gaps in the framework for achieving a more integrated approach to land use and management.
- DEFRA's work on climate change adaptation and the natural environment and ecosystem services is promising but it needs to be given a higher profile and made part of the mainstream of Government policy and decision making.
- The Wildlife Trusts have a track record of delivering landscape scale nature conservation in partnership with a wide range of organisations, and through our work on creating A Living Landscape are actively involved in helping wildlife and people adapt to climate change.

1. INTRODUCTION

1.1 The Wildlife Trusts welcome the opportunity to respond to the Environmental Audit Committee Adapting to climate change inquiry.

1.2 There are 47 local Wildlife Trusts across the whole of the UK, the Isle of Man and Alderney. We are working for an environment rich in wildlife for everyone. With nearly 800,000 members, we are the largest UK voluntary organisation dedicated to conserving the full range of the UK's habitats and species, whether

they be in the countryside, in cities or at sea. We manage 2,265 nature reserves covering more than 90,000 hectares; we stand up for wildlife; we inspire people about the natural world and we foster sustainable living. For more information on The Wildlife Trusts, please refer to www.wildlifetrusts.org

1.3 The Wildlife Trusts are heavily engaged in policy and delivery on climate change adaptation at national, regional and local levels. We work closely with local authorities, regional bodies and devolved administrations on a range of aspects of climate change adaptation, from strategy and planning to land management and community development. We have been instrumental in highlighting the importance of climate change adaptation for wildlife and people to decision makers, and in particular:

- (a) Local and regional—climate change action plans.
- (b) Local, regional and national—biodiversity adaptation including Local Wildlife Site systems and Biodiversity Action Planning.
- (c) Regional—habitat opportunity mapping to inform planning decisions, and involvement in development control.
- (d) National—policy development including membership of the DEFRA Natural Environment: Adapting to climate change group and the National Ecosystem Assessment User Group.

1.4 The Wildlife Trusts have produced a strategy document entitled *A Living Landscape* which calls for the restoration of the UK's fragmented ecosystems, for wildlife and people. This report sets out The Wildlife Trusts' position and vision of the future with regard to adaptation to climate change, but also provides numerous case studies of landscape-scale conservation schemes. The case studies demonstrate where we are directly engaged in delivering the adaptation changes required on the ground, and the holistic benefits that this work can bring.

1.5 We would be pleased to provide further information in relation to points raised in this response.

2. ADAPTATION PRINCIPLES

2.1 Strategies to deliver climate change adaptation have been outlined by DEFRA (DEFRA 2007, 2008). Four key principles to form the centre of an environmental adaptation strategy stand out in these documents, namely:

- (a) *Conserve existing biodiversity*—conserve current high quality wildlife habitats and ensure we maintain the range and ecological variability of habitats and species.
- (b) *Reduce sources of harm* not linked to climate change—in other words do not further reduce the resilience of our natural environment.
- (c) *Develop ecologically resilient and varied landscapes*, keeping variety and quality in the local landscape so species and habitats can relocate and re-form within their existing location and so that ecological processes can continue to function at a large scale.
- (d) *Establish ecological networks* so species and habitats can move, interact and re-form over longer distances.

2.2 Environmental adaptation principles are needed to develop these broad themes into practical strategies at national, regional and local levels. These must be underpinned by effective legislative frameworks.

3. POLICY ALIGNMENT

3.1 There is an extensive array of policies, mechanisms and legislation which currently determines how land is used and managed. These include agriculture, planning, woodland and forestry and wildlife protection mechanisms. However, there are very few current legislative provisions for proactive delivery of ecosystem function and security. Nor are those mechanisms that do exist aligned geographically or strategically. Even with the adaptation provisions of the Climate Change Act, without a strong new driver for the natural environment, this situation is unlikely to change.

3.2 Thus, whilst site and species protection policies are good, there is little to encourage habitat expansion, creation, interconnectivity or the overall functioning of natural processes in the wider environment in the face of climate change or otherwise.

3.3 The Wildlife Trusts consider that a more integrated approach to land use planning and management for the long term is needed. Consequently, The Wildlife Trusts proposed a number of high level policy changes at a Parliamentary event in November 2008. Climate change adaptation is a key driver to these policy changes.

3.4 In thinking more broadly about an integrated approach we consider that there is a need for a new statutory spatial and strategic framework to drive decisions about land use and land management to achieve ecosystem recovery. We also believe that there is a need to increase the speed and scale of ecosystem restoration and habitat creation by introducing mechanisms for positive planning, encompassing all aspects of land use and land management.

3.5 The recent Government announcement (28 September) that said it would establish a Commission to review England's wildlife and ecological network, including its links with our National Parks and its ability to adapt to climate change and other pressures, is hugely welcome. The Wildlife Trusts will play our part in contributing to the work of the Commission once it is established.

4. CREATING A LIVING LANDSCAPE

4.1 On a practical level, and linked to the adaptation principles above, we believe that there is need to create A Living Landscape which allows wildlife and people to adapt to climate change, by:

- *Protecting and enlarging "core" areas.* The most important wildlife-rich areas may already have some protection, but this may need to be strengthened and expanded. Looking after the best of what we have is the first priority; any future environment can only evolve from that which survives from today.
- *Linking and joining up the "core" areas.* Improving connectivity between areas of high ecological quality includes building physical connections, stepping stones and corridors as part of ecological networks based on natural features such as rivers, belts or blocks of semi-natural vegetation or non natural features such as green lanes.
- *Improving the "permeability" or "greening" of the rest of the landscape.* This involves improving environmentally sensitive management in the wider landscape such as in intensively farmed agricultural land, in river catchments and in urban areas.

4.2 This approach reflects the key requirements of an environmental climate change adaptation strategy as set out by DEFRA.

4.3 Climate change will bring about more extreme weather events such as hot, dry summers, storms and floods. A 2°C rise in temperature will shift the natural range of some species over 150 miles to the north or nearly 1,000 feet up hillsides. Now more than ever it is vital that we manage and use our land, so it is hospitable to plants and animals enabling them to move and adapt to new conditions for survival. Critically, we need to restore healthy, Living Landscapes that can help to alleviate floods, control pollution and help us cope with extremes of temperature.

4.4 Across the UK The Wildlife Trusts are working with partners to deliver 112 Living Landscape schemes, which in total cover more than 1.4 million hectares.

4.5 These Living Landscape schemes are focusing resources on the creation and restoration of habitats of all kinds, for a wide range of species and with the assistance and support of local communities.

4.6 An example of these initiatives include the Devon Wildlife Trust "Working Wetlands" scheme, which over five years will aim to work with over 750 landowners in priority areas. Wildlife rich habitats will be restored and in strategic areas recreated, enabling the reconnection of the natural landscape. More robust ecosystems will be the product, better able to withstand the rigours of climate change. Further information can be provided about this project or any other Living Landscape scheme.

DEFRA (2007) *Conserving biodiversity in a changing climate: guidance on building capacity to adapt.*

DEFRA (2008) *England Biodiversity Strategy Climate Change Adaptation Principles.*

TEEB (2008) *The Economics of Ecosystems and Biodiversity, an interim report.*

5 October 2009

Memorandum submitted by the Commission for Architecture and the Built Environment (CABE)

1. INTRODUCTION AND SUMMARY

1.1 CABE welcomes this opportunity to submit evidence to the Environmental Audit Committee. As the Government's adviser on architecture, design and the built environment, climate change and sustainable development have become central to our work. Adaptation in particular is an increasing component of our advice and guidance to both public and private sector. Emissions reduction and mitigation more generally have long dominated the debate on climate change, but adaptation is as pressing a priority, and also provides many opportunities to improve the quality of life for local people.

1.2 The National Audit Office (NAO) report on governmental policy and implementation on adaptation is an excellent first step in measuring our preparedness to adapt to climate change at a strategic level. However, the departmental self assessments are too focused on the risks posed by climate change, rather than identifying opportunities presented in managing those risks. The new Departmental Carbon Budgets, and proposed local carbon budgets, are a good way to ensure that the impacts of our emissions are seen holistically, and will encourage departments to work together to find methods of carbon reduction. A similar approach is needed to bring together various policies and services that will be impacted by climate change.

1.3 Climate change and the shift to a lower carbon economy present an opportunity for policy makers to show leadership. Rather than waiting hopefully for the market to moderate our consumption of fossil fuels and other resources, it is an opportunity to create better places in which we can all live more resource-efficient lives.

Climate change, even when its man-made causes are accepted, often seems abstract and remote to the public. Mitigation and curbing carbon emissions are particularly intangible. However, the impacts of climate change, such as changing weather patterns, are evident, and prompt solutions with which everyone can identify and can understand.

The Victorians took bold steps to redesign cities and create new places that met the challenges of the day, namely pollution and infectious disease. Today, climate change provides the same opportunities to remodel our neighbourhoods. If we make wise choices now we can use this opportunity to make our neighbourhoods more beautiful and useable.

1.4 CABE has four recommendations to the Committee:

1.4.1 Everything we do happens in a place. This may seem obvious, even simplistic, but too often policy makers work in terms of service silos or administrative boundaries. This way of viewing the world fails to take account of the synergies and efficiencies which can be found in taking a place-based approach.

The built environment can be designed in such a way as to encourage public transport use, or walking and cycling. It can be designed to encourage people to leave their windows open and take advantage of passive cooling. Or it can be designed to encourage people to use their cars, keep their windows shut, and install air conditioning. All of these decisions about building design (on a micro-scale) or urban design (on a macro-scale) will need to be assessed in light of our changing climate.

A place-based approach to service delivery should be undertaken to create the greatest impact and value for money of climate change adaptation strategies. We have found through our work with the Core Cities in developing the Sustainable Cities programme (www.sustainablecities.org.uk), as well as our work in Design Review and Enabling, that there are multiple benefits to be had from taking a place-based approach. CABE is currently working with SDC, DECC, HCA and CLG to develop a programme of research that focuses on delivering place-based solutions to both mitigation and adaptation, while concurrently addressing issues of regeneration and social sustainability.

1.4.2 Many adaptation measures will need to be implemented across local authority boundaries. *Therefore Government must encourage partnership working either through Multiple Area Agreements, or through extending the Manchester and Leeds City-Region pilots.* Through evidence gathered from national and international examples, CABE has developed a methodology for Strategic Urban Design which could, and should, be used by regional and sub regional bodies and partnerships when adapting to climate change.

1.4.3 Local government has been incentivised to deliver on mitigation targets through the Comprehensive Area Assessment, in particular through NI185 and 186, Planning Policy Statement 1 (PPS1) supplement on climate change and more pressingly by the carbon reduction commitment.

Our research has shown that the incentives for responding to the adaptation challenge have not been as effective. NI188, Planning to adapt to climate change, should be made mandatory for all local authorities to demonstrate progress in this important area, and its evidence base should be strengthened. Similarly an updated PPS1 should reflect the importance of adaptation in any local development framework.

1.4.4 In particular, Government departments must formally recognise the strategic importance of green infrastructure, strategic networks of green spaces, in promoting a number of governmental objectives, not least in providing multiple benefits for climate change adaptation such as mitigation of the urban heat island effect and surface water management.

This should be enacted by creating a standardised methodology for local authorities to assess the quantity and quality of their open spaces in the upcoming update of Planning Policy Guidance 17. Urban green spaces in particular should be mapped and recorded in an accessible national database to enable cross boundary planning and delivery of green infrastructure.

Several Government departments including DEFRA, DoH, DfT, and CLG have commissioned research or guidance into the impact of green and open spaces in delivering their policy objectives. However, the crucial role of green infrastructure in climate change adaptation has been largely overlooked in policy terms. This is evidenced by its absence in the NAO report and the departmental self assessments.

2. THE GOVERNMENT'S RESPONSE TO CLIMATE CHANGE ADAPTATION

2.1 The NAO report makes clear that the Adapting to Climate Change team at DEFRA and the UKCIP programme have made a good start on raising the profile of the adaptation agenda within Government, and CABE actively supports their endeavours. However, the understanding of the actual impacts of a changing climate appear to amount to a, perhaps unsurprising, concern for flood defences rather than any thinking about changes in the way in which services should be delivered, or cities and neighbourhoods planned. The high level adaptation plans due from Departments by Spring 2010 should include data on how changes to the built environment can contribute to addressing the effects of climate change.

2.2 In the NAO report, Figure 8, "Climate change impacts and risks identified by Government Departments", the areas at risk are broken down in terms of departmental responsibility and this approach does not reflect the synergies between departmental agendas and the impact of these policies on people's well-being and quality of life. Government Departments need to demonstrate a more creative and holistic approach to managing the risks associated with climate change. We have analysed the self assessments of those departments with whom we have particularly close working relationships. We are also working with other Departments such as DECC, DoH and DCSF, but felt that our expertise is best applied to the following departments, specifically:

2.2.1 *CLG*: In managing the risks identified to both buildings and infrastructure it is important that CLG reflect the opportunities presented by green infrastructure in managing flood risk and the urban heat island effect. Planning Policy Guidance 17 on Open Space, Sport, and Recreation is currently being updated by CLG. This a prime opportunity to ensure that the planning policy reflects the strategic role of green infrastructure in climate change adaptation. Similarly there is an opportunity to update Planning Policy Statement 1 Supplement on Planning for Climate Change to expand the section on climate change adaptation. CABE would be pleased to expand further on the ways in which these opportunities can be used to best effect.

2.2.2 *DCMS*: The primary risk identified by DCMS is to the delivery of the Olympics in 2012. While this is indeed a significant risk in the short term, DCMS should also take account of the good practice being demonstrated by the Royal Parks Estate Management team in preparing for climate change.

2.2.3 *DEFRA*: As the lead department on climate change adaptation, DEFRA has gone furthest in terms of assessing the impact of climate change on its policy priorities. However, the focus of their identified risks is on food production and flooding impacts. They do not, however, recognise the significant impacts that warmer temperatures will have on the UK population, the majority of whom live in cities and will therefore be vulnerable to the urban heat island effect.

2.2.4 *DfT*: Transport infrastructure is at risk from climate change, but the department should identify the risks of having unsustainable infrastructure in light of climate change, rather than risks to existing infrastructure. In preparing for a changing climate it is important to achieve a modal shift from a car-dependent transport system to a more multi-modal approach. Many of the recommendations of Towards a Sustainable Transport System could be easily integrated into their risk management and opportunities plan.

3. PLACE-BASED APPROACHES TO CLIMATE CHANGE ADAPTATION

3.1 Our towns and cities need to adapt to the changing climate. This is about more than reducing flood risk and improving resilience. It requires a shift in the way our planners, public service providers, and local officials think about our towns and cities. The Government have recognised the importance of a place based approach to public services, both through their World Class Places report, and also through the new Total Place programme on joined up service delivery.

3.2 Taking a place-based approach to climate change adaptation means ensuring that local services are delivered in such a way that they can add value to one another and respond to people's changing needs.

3.3 Our villages, towns and cities have largely been built to accommodate a 19th or mid-20th century weather pattern. However, because the replacement rate of our buildings and infrastructure is so slow (80% of the building stock in 2050 is already in existence) we need to take a holistic and ambitious approach to retro-fitting them to be more resilient to a changing climate. While there is beginning to be a body of knowledge on how to retro-fit our homes and neighbourhoods for energy efficiency to curb carbon emissions, more consideration should be given on how to adapt our existing neighbourhoods to extreme weather events.

To this end CABE is working with the Sustainable Development Commission, Homes and Communities Agency, the Department for Communities and Local Government and the Department for Energy and Climate Change on developing a methodology for place-based approaches to adaptation and mitigation that confer wider community-level benefits.

The report from this piece of work is expected in Spring 2010 and we would be pleased to share it with the Committee at that time.

4. LOCAL AUTHORITIES WORKING TOGETHER TO ADAPT TO CLIMATE CHANGE

4.1 Local authorities have an important leadership role to play to ensure that infrastructure, buildings, public spaces and services take account of the changing climate as well as reducing greenhouse gas emissions.

4.2 Dealing with climate change is about city and town planning and management in its widest sense, and is the responsibility of all those involved in strategic decision-making. This includes those senior officers and members with responsibility for economic planning, housing strategy, transport planning, children's services, health and well-being, environment, green space and regeneration as well as spatial planning.

4.3 The planning policy framework is a critical tool for local and regional authorities to implement strong principles that will affect action on climate change. CLG, in its review of PPS1 Supplement on Climate Change should ensure that adaptation has equal weight to mitigation.

4.4 CABE's research into the climate change policies of 50 local authorities in the core city-regions has shown that adaptation is one of the least well integrated policies across local authorities. This could be improved by a revision of the evidence base for NI188: Preparing to Adapt to Climate Change and by making this a mandatory indicator for all local authorities to show improvement against.

4.5 Many adaptation measures, particularly those which relate to changes in infrastructure and flooding defences, must be taken at a regional or subregional level. While there has been a proliferation of regional and subregional bodies and partnerships there has not been a commensurate tool developed to work at this kind of spatial scale. To fill this gap CABE has been developing a Strategic Urban Design toolkit which will enable these new bodies to plan for infrastructural changes in a holistic and design-led way. The bureaucratic boundaries which define our current regional structures are not necessarily the most appropriate ways to think about service delivery or the delivery of built assets such as shopping centres, transport networks and green infrastructure.

5. THE IMPORTANCE OF GREEN INFRASTRUCTURE IN CLIMATE CHANGE ADAPTATION

5.1 Green Infrastructure is a strategically planned and delivered network of a wide range of high quality green spaces and other environmental features. It should be designed and managed as a multi-functional resource capable of delivering those ecological services and quality of life benefits required by the communities it serves. Its design and management should also respect and enhance the character and distinctiveness of an area with regard to habitats and landscape types.

Green infrastructure includes established green spaces and new sites and should thread through and surround the built environment, connecting the urban area to its wider rural hinterland. Consequently, it needs to be delivered at all spatial scales—regional, sub-regional, local and neighbourhood levels, accommodating both accessible natural green spaces within local communities and often much larger sites in the urban fringe and wider countryside. Green infrastructure has a significant role to play in the climate change and sustainability agenda and should be considered in its widest sense in this inquiry.

5.2 Well-designed green infrastructure helps adapt to the effects of climate change by:

- managing surface water run-off to prevent flooding;
- storing tidal flood water to reduce the risk of tidal flooding in estuaries;
- storing river flood water to reduce the risk of fluvial flooding, eg through the restoration of floodplains;
- creating cooler microclimates and therefore reducing the need to cool buildings; and
- providing shelter and protection in extreme weather; providing habitats, corridors and a more permeable landscape to help wildlife adapt to climate change.

Well-designed green infrastructure mitigates climate change by:

- reducing travel through provision of local recreation opportunities;
- providing sustainable transport corridors to reduce carbon emissions from vehicles;
- supplying biomass or biofuels to directly replace fossil fuels;
- supplying timber to replace less sustainable construction materials
- increasing local food production to reduce food miles; and
- improving carbon storage and sequestration.

5.3 The benefits of green infrastructure and high quality open spaces have been recognised by DEFRA, DoH, CLG, and DCMS. However, the role of green infrastructure in adapting to climate change is not represented in the management of climate change risks identified by these departments. The wider benefits of green infrastructure include:

Improve quality of life: Areas of multiple deprivation often contain the most neglected and under-used areas of public space. The rehabilitation of a park in a deprived area can act as a catalyst to rehabilitate the entire community.

- reducing crime (and the perception of crime) through natural surveillance in well used public spaces;
- encouraging community integration through using green spaces for social events;
- attracting businesses by ensuring attractive environmental surroundings; and
- increasing house prices by increasing green spaces.

Healthier residents: Natural England has demonstrated the benefits of green space for many health problems including cardio-vascular disease, obesity, depression, coronary-pulmonary disease and diabetes:

- reducing the urban heat island effect through evaporative cooling, shading and providing corridors for cooler air to flow into urban areas as well as filtering polluted air;
- providing safe, easily accessible green routes for walking and cycling; and
- reducing physical and mental health problems through physical activity and enjoyment of open space and nature.

Stronger local economy:

- increasing green space can lead to an increase in average house prices in an area; and
- creating environmentally attractive surroundings encourage businesses to relocate to a place.

5.4 Though green infrastructure must be delivered locally, it should be planned for at a regional or subregional level in order to ensure that the maximum multiple benefits are achieved. The revised PPG17 should set out the national policy for green infrastructure in accordance with the *World Class Places* action plan. This should also include a standardised methodology for assessing, mapping and measuring urban green spaces which should take account of both accessible and inaccessible green infrastructure. However, local authorities should, of course, be encouraged to set local standards for their accessible open spaces.

CLG should also work with other departments to develop a national database and map of existing urban green infrastructure. Current information is patchy and difficult to join together. Without such a database it will be impossible to plan effectively for this critical piece of infrastructure. If the new PPS17 policy and accompanying guidance set out a standardised methodology then this database/spatial map would be relatively easy to build and maintain as it would be gathered at the local level.

6 October 2009

Memorandum submitted by the Woodland Trust

1. The Woodland Trust welcomes the opportunity to submit evidence. The Trust is the UK's leading woodland conservation charity. We have three aims: to enable the creation of more native woods and places rich in trees; to protect native woods, trees and their wildlife for the future; to inspire everyone to enjoy and value woods and trees. We own over 1,000 sites and have 300,000 members and supporters.

2. We believe the natural environment is not an optional tool for adaptation of our society and economy but a prerequisite. As such, successful adaptation should be measured in terms of environmental outcomes. The model of sustainable development which balances environment, society and economy, but in reality sees the environment largely as a constraint to economic development, is undermined by the empirical evidence of recent decades. Climate change adaptation must consider the vulnerability of the natural environment and consider how society and the economy need to change to make it resilient.

3. We endorse the England Biodiversity Strategy (EBS) Climate Change Adaptation Principles²⁷ aimed at people responsible for delivering actions across a wide range of sectors: agriculture; water and wetlands; woodland and forestry; towns, cities and development; coasts and seas.

4. The Climate Change Act directs focus towards identifying, mitigating and managing risks. We believe that priority should be given across government to identifying win-win solutions and ensuring cross-sectoral knowledge transfer. This demands more joined-up government both within departments, such as Defra, and between departments. The challenge is to develop an overall land-use strategy that integrates the needs of biodiversity and "productive" land uses (eg agriculture and forestry, in particular, but also housing and infrastructure). This should look beyond zoning land, into "productive" and "conservation", to more convergent land uses where biodiversity is a fundamental building-block for other activities.

5. By working with nature, there are opportunities to deliver resilient landscapes able to absorb and respond to changes while sustaining biodiversity and ecosystem goods and services in both rural and urban areas. This demands intelligent use of an ecosystem approach. Ecosystem services cannot be described

²⁷ Smithers, R J, Cowan, C, Harley, M, Hopkins, J J, Pontier, H, Watts, O (2008) England Biodiversity Strategy Climate Change Adaptation Principles. Conserving biodiversity in a changing climate. Defra. Downloaded at: www.defra.gov.uk/wildlife-countryside/biodiversity/biostrat/index.htm

through a reductionist view of “cause and effect”. They are the result of complex and dynamic ecosystems that determine emergent services. It also requires that the needs of individual landowners are matched with the wider needs of society.

6. The urgency to act for adaptation is illustrated by the time it takes for a tree to grow. New approaches need to be piloted at a large scale, within a time period commensurate with the challenge. If this is to happen, cultural and institutional barriers need to be addressed without delay. Government departments appear to take simple short-term actions while awaiting greater certainty. There is a need to embrace uncertainty and make strategic decisions addressing the full range of variation in projected changes and their impacts. Integrated adaptation that works with nature makes sense irrespective of the speed, scope, scale and direction of climate change.

7. Those actions that take longest to bear fruit must be undertaken now. For example, the UK is amongst the least-wooded countries in Europe with 12% cover, and England just 9%, compared with a European average of 44%.²⁸ We believe there is an urgent need to double our native tree cover. This would not only help create landscapes that allow as many species as possible to adapt in response to change but also would offer opportunities for adaptation that improve air and water quality, alleviate flooding, conserve soil, support food production and safeguard the nation’s health.

8. The Government’s *UK Low Carbon Transition Plan* published in 2009²⁹ highlighted that creation of 10,000 hectares of woodland per year could remove up to 50 million tonnes of carbon dioxide by 2050 and deliver substantial benefits for adaptation. We would warmly welcome this as a step in the right direction, if it is native woodland. The challenge for government is to catalyse action. Government departments and statutory agencies, regard woods and trees as the responsibility of the Forestry Commission (FC). However, inadequate resources and a desire to promote woodland management within Forestry Commission England (FCE) tend to focus its attention on existing woodland. Meanwhile, other departments (including Defra) have yet to fully grasp the range of cost-effective opportunities that new woodland and trees could deliver simultaneously for numerous contemporary policy challenges and simply wait for FCE to take action.

9. Written evidence is provided below specifically in relation to each of the areas identified in the Environmental Audit Committee’s press notice.

10. *The extent to which the Adapting to Climate Change Programme (ACC Programme) will increase resilience by embedding adaptation and climate change risk assessment into the work of Government Departments*

10.1 The ACC Programme is directed by a Programme Board with senior representatives from Government departments. Defra provides the delivery team. Responsibility for embedding adaptation into policies rests with individual Government departments. We are concerned opportunities are being lost to: identify joined-up solutions; engender common understanding and commitment to delivery; and minimise additional costs of integrated adaptation.

10.2 The degree to which Government departments are working in isolation of one another may be typified by the Defra project, “Developing a Strategic Framework: The Natural Environment—Adapting to Climate Change”. A welcome development is that Defra has established a project partners group “to ensure that the project is able to draw on the significant existing expertise in both policy and delivery; to ensure that key partners have an opportunity to influence the developing framework; to enable the project team to test emerging conclusions and recommendations”. However, the group lacks representation from other departments. It includes representatives from the Government Office Network, Regional Development Agencies, Local Government Association and English National Park Authorities Association and otherwise only comprises the usual suspects from Natural England (NE), Environment Agency (EA), FCE, Joint Nature Conservation Committee (JNCC) and environmental NGOs.

11. *The extent to which Government departments have identified the risks from a changing climate that will stop them meeting their objectives*

11.1 Progress with Defra’s project above demonstrates understanding of the potential direct and indirect impacts of climate change identified by the environmental sector. However, climate change will bring indirect impacts to Defra’s interests through changes in socio-economic drivers, working practices, cultural values, policies and use of land and other resources relevant to other departments. Due to their scale, scope and speed many could be more damaging to the natural environment than direct impacts. This reinforces the need for wide consultation and cross-departmental assessment, for example, in relation to planning.

11.2 FCE consulted widely within the forestry sector on a delivery plan for England’s Trees, Woods and Forests (ETWF) Strategy,³⁰ which gave consideration to climate change. FC is consulting currently on the UK Forestry Standard Forests and Climate Change Guidelines.³¹ FCE is starting to screen all policies from

²⁸ Forestry Commission (2009) Forestry statistics 2009. Downloaded at: <http://www.forestry.gov.uk/statistics>

²⁹ DECC(2009) The UK Low Carbon Transition Plan. The Stationary Office. Downloaded at: http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx

³⁰ Forestry Commission (2008) A delivery plan for England’s Trees, Woods and Forests Strategy. Downloaded at: <http://www.forestry.gov.uk/etwf>

³¹ Forestry Commission (2009) Forests and Climate Change Guidelines. Downloaded at: www.forestry.gov.uk/ukfs

a climate change perspective and has appointed someone to develop a climate change action plan for the public forest estate. However, FC is producing what is intended to be a comprehensive report on forestry and climate change without wide consultation, even within the forestry sector. It will be launched in late-November and FC should invite comments subsequently to accommodate information and views from a broad constituency.

12. The suitability of the processes and structures in and across Government departments for identifying, mitigating and managing these risks and determining the future priorities of central government's approach to adaptation (and the National Adaptation Programme)

12.1 The EBS³² is a Government strategy, prepared in partnership with a broad range of stakeholders in the public, voluntary and private sectors. It sets out a series of actions for government and its partners to make biodiversity a fundamental consideration across public policy. It has significant potential to promote adaptation to climate change. However, strategy implementation groups have made limited progress in reviewing delivery against the EBS Climate Change Adaptation Principles. Defra should allocate greater resources to the implementation of the Strategy.

12.2 It would be helpful if there was greater join-up between Defra, NE, EA and FCE, as evidenced by their work in relation to woodland and trees.

13. How well the overall direction for work on adaptation has been set, the effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance), the allocation of powers and duties and how well are issues like social justice addressed in adaptation policies

13.1 The Reporting Power and accompanying statutory guidance is focused on key organisations responsible for infrastructure and essential services and those likely to be particularly vulnerable to climate change impacts. We believe it is vital that authorities that have a key role in adaptation across sectors should also be directed to report to the Secretary of State. Although NE and FCE are “to be invited to report”, we believe they should be directed to do so. Both have a key role to play in adaptation, as identified in Defra’s recent consultation document.³³ It highlights that FCE recognises that climate change adaptation is “vital both to its own estate and its responsibilities for privately-owned forestry”. While this is true, FCE also has a vital role to play in promoting establishment of new woodland and trees through delivery of the ETWF Strategy.

13.2 Issues such as airport expansion and planning will have a significant impact on climate change adaptation meaning that environmental duties need to be at the centre of Government decisions. The decision to expand Heathrow stands in stark contrast to the leadership the UK has shown in other areas of climate change policy. It suggests a serious lack of join-up in meeting climate change commitments and consequences for adaptation.

13.3 The creation of community woods and conservation of green spaces can deliver on social justice and climate change adaptation. There are strong links between a lack of urban green space and social deprivation, poor health outcomes and crime. Multi-functional green space can alleviate flooding and improve air and soil quality.

14. Whether short-term priorities for action, including identifying and protecting key infrastructure and systems (for example power, food, water, transport infrastructure, defence and security), have been identified and how these are or might be addressed

14.1 Our natural environment is the key infrastructure underpinning a wide range of ecosystem services on which we all depend. Despite being one of the least wooded countries in Europe, our ancient woodland resource, which comprises just 2% land cover, continues to be threatened by development. We know of 865 ancient woods affected by planning applications since 2000. A new survey of urban trees, their condition and management³⁴ also identifies ongoing loss of vital services through a reduction in canopy cover. A short-term priority is to halt such losses.

14.2 Government needs to exemplify integrated adaptation on its estate, if it is to help catalyse appropriate working practices, use of land and other resources across the public and private sectors. For example, government should identify land on its estate where establishing new woodland and trees would deliver a wider range of ecosystem goods and services than currently.

³² Defra (2002) Working with the grain of nature: a biodiversity strategy for England. Downloaded at: http://www.ukbap.org.uk/EBG/england_biodiversity_strategy.asp

³³ Defra (2009) Consultation on the Adaptation Reporting Power in the Climate Change Act 2008. Downloaded at <http://www.defra.gov.uk/corporate/consult/climate-change-adapting/index.htm>

³⁴ Britt, C & Johnston, M (2008) Trees in Towns II. A new survey of urban trees, their condition and management. DCLG. Downloaded at: <http://www.communities.gov.uk/publications/planningandbuilding/treesintownsii>

15. *The funding, support, training and other resources available, including at a local and regional level, for:*

15.1 *building capacity to adapt to climate change*

- 15.1.1 Substantial expansion of England's semi-natural habitats, including native tree cover, needs to be used by all sectors to develop resilient landscapes. The needs of individual landowners must be matched with the potential for their land to deliver ecosystem goods and services to society.
- 15.1.2 The UK Low Carbon Transition Plan, which highlights the benefits of large-scale woodland creation is backed by a commitment that, "The Government will support a new drive to encourage private funding for woodland creation. This will allow businesses and individuals to help the UK meet its carbon budgets, whilst delivering the other benefits that woodlands can bring".
- 15.1.3 FCE grants for woodland creation are focused on access and wildlife, not ecosystem services more generally. They are insufficient to attract private investment and are too inflexible. Rates of woodland creation have fallen since 2005 from 5,000ha to 2,000ha per annum. Woodland creation has been successfully promoted in the National Forest to bring about landscape-scale change. The National Forest Tender Scheme and Landscape Change Scheme exemplify the flexibility and size of grants (£5–6,000 per ha) required that cover the true costs.
- 15.1.4 FCE needs to promote woodland creation more strongly across government. At present, other departments (including Defra) remain insufficiently aware of the cost-effective opportunities that new woodland and trees could deliver for their outcomes.
- 15.1.5 In continuing to develop a more robust and comprehensive evidence base of the potential impacts and consequences of climate change, it is vital that inter-disciplinary cross-departmental research is steered and funded by relevant stakeholders. It is also important to recognise that uncertainty may be the only certainty. There is a danger that the UK Climate Projections (UKCP09)³⁵ may encourage people to focus on "preferred futures", which may never come true, rather than embrace all possible scenarios.
- 15.1.6 Defra is researching individual case studies to inform policy options and best practice for adaptation. They are likely to focus on land in public/conservation ownership, as other more integrative landscape-scale projects are only just being initiated in the UK. This may not be a good basis on which to proceed, as it may simply reinforce a view that landscape-scale action is about government and large NGOs buying tracts of land. It would be better to review examples from developing countries, supported by theoretical approaches and parallel UK examples of participatory approaches.

15.2 *specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure*

- 15.2.1 Semi-natural habitats could play a major role in delivery of the Water Framework Directive and Floods Directive. For example, models suggest creation of new woodland spanning major bottlenecks on floodplains could absorb and delay major flood events. Creating riparian woodland buffers could reduce water temperatures substantially (important for Salmonid fish), and reduce pollutants and soil erosion by greater than 90%.³⁶ However, cultural inertia within the Environment Agency favours hard-engineering solutions and demands quantification of such benefits at a catchment scale. This leads to a "chicken and egg" situation, which inhibits implementation of "new approaches piloted and monitored at a large scale and within a time period commensurate with the challenge".³⁷ Other countries have been far more proactive in establishing trees and woods to alleviate flooding (eg Catskills, USA; Victoria, Australia) and improve water quality (eg Denmark).

15.3 *helping individuals and organisations conduct their own climate change risk assessments and judge what actions they need take*

- 15.3.1 Vulnerability assessment is the first step many environmental organisations are taking in relation to adaptation at a European, national, regional or local scale. Recent years have seen an explosion in academic research and delivery projects looking at vulnerability assessments. There are a myriad of approaches and the terminology is subject to a variety of meanings and confusion. While the many methodologies adopted provide a rich vein for ideas, it could lead to different interpretations of vulnerabilities and unnecessary conflict. This could act as a barrier to the understanding and engagement of managers of land and other resources vital to adaptation of the natural environment. The EBS Climate Change Adaptation workstream has

³⁵ Murphy, J *et al* (2009) UK Climate Projections. UK Climate Impacts Programme (UKCIP). Downloaded at: <http://ukclimateprojections.defra.gov.uk/content/view/824/517/>

³⁶ Calder, I R, Harrison, J, Nisbet, T R & Smithers, R J (2008) Woodland actions for biodiversity and their role in water management. The Woodland Trust, Grantham.

³⁷ Smithers, R J, Cowan, C, Harley, M, Hopkins, J J, Pontier, H, Watts, O (2008) England Biodiversity Strategy Climate Change Adaptation Principles. Conserving biodiversity in a changing climate. Defra. Downloaded at: www.defra.gov.uk/wildlife-countryside/biodiversity/biostrat/index.htm

identified that it would be timely and helpful to synthesise the different approaches to assessing vulnerability of biodiversity and associated ecosystem goods and services. A review has recently been initiated.

16. *The monitoring and evaluation of work on adaptation, including thoughts on how progress on adaptation can be quantified and success measured*

16.1 As we believe the natural environment is not a tool for adaptation but a prerequisite, in our view, successful adaptation should lead to:

- 16.1.1 No further loss of ancient and other irreplaceable wildlife habitats.
- 16.1.2 Restoration of all ancient and other semi-natural habitats planted with non-native conifers.
- 16.1.3 Increasingly permeable landscapes that allow as many species as possible to adapt and move in response to change, as measured by the UK Biodiversity Indicator of habitat connectivity.³⁸
- 16.1.4 An increase in trees outside of woods, including urban tree cover.

17. *The effectiveness of communication within and between departments; and between government, local government, business and the general public on adaptation*

17.1 Local authorities have to report the level of preparedness they have reached, as identified in National Indicator 188³⁹ “Planning to Adapt to Climate Change”, which is a process-based indicator. The guidance notes claim “our understanding of the adaptation agenda is not yet sufficient to specify outcomes, but also that climate impacts are local and it is impossible to have a generic outcome indicator at the moment which is applicable to all areas”. This belies a temptation to identify complex indicators that explicitly link facets of the natural environment with the delivery of specific ecosystem services. We believe such a reductionist approach should be avoided. We advocate that the outcomes identified in 16.1 (above) should be adopted as indicators at national and local levels, in addition to NI 188.

17.2 The economic climate demands that government packages climate change adaptation innovatively, as a component of Public Service Agreements and as a cost effective strategy that delivers business benefits.

17.3 Government should engage with partners, rather than take the lead, in communicating adaptation to private landowners and a wider public.

18. *Whether work on adaptation should be embedded into existing sustainable development frameworks and, if so, how this might be achieved*

18.1 This makes sense providing commitments on the natural environment are not watered down. Central government, local authorities and the private sector would all need to be clear what “sustainable development” means, as its definition varies wildly.

18.2 Moreover, adaptation to climate change (and with it, protection and expansion of semi-natural habitats, including woodland and trees) should be incorporated into Planning Policy Statement (PPS) 1, “Sustainable Development”, and the revised PPS 9, “Biodiversity and Geological Conservation”.

8 October 2009

Memorandum submitted by Ofwat

It is particularly important that the water and sewerage sectors manage the risks of climate change because of the serious societal impacts of failure. Our aim is to protect consumers, promote value and safeguard the future. To achieve this, the sectors must respond effectively to the risks of climate change.

Our key points are as follows:

- As economic regulator, we have an important role to play. We are leading the sectors by taking a proactive approach to encouraging the companies to adapt appropriately to climate change. Regulation in the water sector has delivered a lot since privatisation; however, we recognise that climate change presents new challenges. This will require new and innovative ways of working.
- The water and sewerage sectors are engaged with the issue of climate change. Both we and the companies we regulate are taking adaptation seriously. This can be seen in our approach to the current price review in which we have seen significant investments in both adaptation and mitigation. One of the most important challenges ahead it to ensure that water is valued in a way which reflects its worth given the additional pressures on resources.

³⁸ The UK Biodiversity Partnership (2009) UK Biodiversity Indicators in your pocket 2009. Defra. Downloaded at: <http://www.jncc.gov.uk/default.aspx?page=4229>

³⁹ Local and Regional Partnership Board (2008) Adapting to Climate Change: Guidance notes for NI188. Downloaded at: <http://www.lga.gov.uk/lga/core/page.do?pageId=1382860>

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- We welcome many of the measures included in the Adapting to Climate Change programme. We are keen to remain engaged and involved in the implementation of these measures. We will continue to work closely with Defra on key adaptation issues.
 - The NAO review provides a sound, but very broad, view of the risks of climate change, particularly to the water and sewerage sectors. A more representative picture of the progress on adaptation requires consideration of how key non-departmental bodies are considering and acting on risks.

ADAPTATION IN THE WATER AND SEWERAGE SECTORS

1. We have a duty to promote sustainable development; and we seek to achieve this by embedding our five core principles of sustainability⁴⁰ in our regulatory approach. We understand that climate change represents a huge challenge to maintaining sustainable water and sewerage sectors.

2. The risks of climate change to the companies and their abilities to fulfil their duties successfully are significant. We seek to regulate in a way which ensures that the companies understand and act appropriately to address those risks. We therefore aim to enable the companies to adapt to climate change and make sure that the most appropriate adaptation action is taken. Fundamentally, the best approach is for each company to include consideration of climate change risks as part of its day-to-day management. We have made this point clear to the companies in our climate change policy statement⁴¹ and our regulatory policies aim to achieve this.

3. Properly embedding adaptation means considering the long-term impacts of climate change, and then accurately assessing and quantifying the resulting risks. These risks should then be embedded into the planning process, so that appropriate steps are taken to manage those risks.

4. We require the companies to plan for the long term, for example by asking them to prepare 25-year strategic direction statements and plan investment in this context. In planning, we expect the companies to consider all risks, including climate change risks together. Considering risks together leads to better solutions which have multiple benefits. It also allows greater potential for the companies to take advantage of any opportunities presented by climate change, for example potential efficiency gains in treatment processes.

5. We have set out the key risks of climate change to the water and sewerage sectors in our climate change policy statement. In it, we highlight the main impacts of climate change. We also outline how we are responding to the challenges and how we expect each company to respond.

6. A key area is maintaining a sustainable balance of supply and demand in the face of a changing climate. This includes planning water resources, managing leakage; and encouraging water efficiency. As part of our regulatory framework, we require the companies to align their business planning with their water resource management plans. These set out how a company will manage its resources for the next 25 years. So that customers only pay a fair price for the costs of adaptation, the companies must justify significant investment using sound science and the best available information.

7. We seek to work with the companies to help them better understand and respond appropriately to the risks of climate change. For example, last year, we commissioned an analytical framework for assessing and improving asset resilience to flooding to address the sectors' need for a consistent approach towards improving asset resilience and service to consumers.

8. A 2007 study showed that over 1,000 water and sewerage assets were currently at risk of flooding and this risk is highly likely to increase with future climate change. As a result of our regulatory approach, the companies have proposed significant action on adaptation over the next five years in the form of asset resilience. Our draft price determinations included £385 million of this proposed investment on resilience. This investment will protect more than 10 million customers from the risk of supply failure, caused by flooding in particular.

9. Adaptation should not mean simply more investment when this is not the most appropriate response. We therefore require the companies to provide economic cases. Our regulatory approach to assessing proposals for investment in climate change adaptation takes full account of whether the measures proposed are necessary, the best way to address a particular risk, and represent value for money.

10. Adaptation now should not compound problems for those in the future. We therefore aim to encourage the most sustainable approaches to adaptation. For example, we require the companies to consider the social and environmental costs and benefits of investment proposals in their business planning. This includes carbon costs and impacts on the local environment.

⁴⁰ Our approach to sustainability is set out in the document "water today—water tomorrow" available at: http://www.ofwat.gov.uk/sustainability/sustainabledev/pap_pos_watertoday.pdf

⁴¹ Our Climate Change Policy statement is available on our website: http://www.ofwat.gov.uk/sustainability/climatechange/pap_pos_climatechange.pdf

THE WORK OF THE ACC PROGRAMME

11. We welcome the measures set out in the review, which form part of the adapting to climate change programme. We are currently engaged with Defra on a number of these issues, particularly on the use of the reporting power in the Climate Change Act 2008. We and the companies we regulate are highly likely to be asked to report in the first cycle of reporting. We set out our views on this issue in our response to their consultation of June 2009.⁴² In summary, we welcome the proposal that we and the companies report for the first cycle, as a helpful measure to encourage them to consider climate change risks and plan future adaptation measures. We are well placed to adopt an advisory role in contributing to the review of the reports that the companies submit. We would also expect to be closely involved in any decisions resulting from assessment of companies' reports. However, we do not believe that it would be appropriate or practical for us to take overall responsibility from Defra for assessing and summarising the reports.

12. We believe that the best way to approach adaptation is to embed consideration of climate change risks into all aspects of business as usual planning and the existing regulatory framework. We therefore plan to work with Defra to understand how this can be achieved after the first cycle of reporting.

13. After the first cycle of adaptation reporting, we plan to carry out a review of the companies' adaptation progress over the next few years. This would be a detailed look at the companies' adaptation measures and plans, involving site visits to companies and in-depth scrutiny of their work. The conclusions of this review will inform our approach to future price reviews.

14. We would be interested to understand more about the ACC programme's work to establish a suite of indicators for adaptation, building on the NI188 indicators. These indicators may help to inform and guide our planned study of adaptation.

15. We do not know the details of the work of the cross-government "Infrastructure and Adaptation" project, which started earlier this year. We would expect that a study of the water and sewerage sectors would form an important part of this review. We are interested to learn more about the review and its conclusions.

16. We have engaged with AEA Technology as part of the climate change risk assessment (CCRA) scoping project. The full CCRA could be a valuable resource across all sectors. However, there is a potential for the study to contain only a superficial appraisal of the risks; in this case there is probably little value to specific sectors that face significant challenges. We intend to play our part in contributing to the CCRA as appropriate.

SPECIFIC RESPONSES TO THE QUESTIONS RAISED (NOT PREVIOUSLY COVERED ABOVE)

17. *The extent to which the Adapting to Climate Change Programme will increase resilience . . .*: As outlined above, we believe that the actions that form part of the ACC programme are largely helpful steps towards encouraging adaptation. However, measuring the success of these actions is difficult, particularly since we are dealing with actions to minimise inherently uncertain, long-term risks.

18. Our analysis of the companies' business plans as part of our price review process has indicated that the best way to justify work on adaptation is by demonstrating that a scheme will lead to a step-change in the risk that consumers bear. This approach has been adopted for flooding resilience measures in order to justify investment and we intend to monitor the outputs of schemes included in the companies' plans on this basis. We would suggest a good way to measure the success of adaptation measures in other areas would be to assess comparable types of reduction in risks over the long term.

19. *The extent to which Government departments have identified the risks from a changing climate . . .*: In a general sense, the departments' risks highlighted in the NAO review appear reasonable. However, the risks are set out in only the broadest of terms and this misses some of the more subtle predicted impacts of climate change. This is particularly true with regard to water. It is therefore difficult to fully assess the extent to which government departments have adequately identified climate change risks to meeting objectives. Similarly, this is true of the adaptive actions set out in appendix 3.

20. *The suitability of the processes and structures in and across Government departments for identifying, mitigating and managing these risks . . .*: There is a large amount of work taking place across government departments with varying degrees of complexity and detail. The adaptation sub-committee (ASC) has a critical role to play in promoting good practice, identifying any gaps and helping shape the ACC programme at a strategic level.

21. It is very difficult for individual departments, with their own specific focus, to ensure that effective connections are made between the disparate areas of government. However, an overall "command and control" approach to climate change adaptation would not be appropriate as individual sectors are best placed to find the most effective solutions.

22. *The funding, support, training and other resources available, including at a local and regional level . . .*: We recognise that the sectors have a large part to play in adapting to climate change. However, we do not believe it should be left entirely to the companies, using customers' money, to fund adaptation measures that do not directly benefit those customers.

⁴² Our response to the consultation on use of the reporting powers is available on our website: http://www.ofwat.gov.uk/sustainability/climatechange/res_ofw_090915adaptpow.pdf

23. Other sectors have a role to play in adapting to climate change. For example, through adopting more sustainable farming practices, the agriculture sector can allow rivers to cope more resiliently with the predicted effects of climate change. We recognise that it is often much more difficult to encourage these sectors to take adaptive action because of the small sizes of individual bodies and their more diverse nature. Such sectors need to be provided with adequate support and leadership in order to ensure they play their part in adapting to climate change. They often benefit from close partnership working.

24. We are also aware that the Environment Agency plays an important role in quantifying the risks from flooding. The companies make use of this data in their business planning on a regular basis. We would expect the Environment Agency to continue in its role as a key body understanding and quantifying flood risks, and understanding the impacts of climate change on those risks. The resources necessary to fulfil this role should be made available. Our experience from assessing business cases shows that pluvial (surface water) flood risks in particular are not well understood; we would expect the Environment Agency to play a central role in developing understanding in this area.

25. The resources provided by UKCIP have contributed towards a greater understanding of the issues within the water and sewerage sectors. We will continue to work closely with UKCIP on developing both evidence and policy in order to fully exploit the additional information and complexity available in the UKCP09 scenarios.

26. *The effectiveness of communication within and between departments . . .*: We recognise the importance of working in partnership with government departments where we share responsibility for adapting to climate change; particularly Defra. We are therefore surprised that the sectors are not mentioned either by the NAO, or apparently by Defra, in the review as a key body for working in partnership on water-related climate change risks. We expect delivery of Defra's objectives in the face of climate change will require working closely with us and water and sewerage companies.

27. We have a clear understanding of our role in the sectors to promote and assess adaptation to climate change and as we set out above. We believe we have made significant progress in this area. We are keen to develop our role in the context of the government's whole ACC programme; for example engaging with government departments and regulators to promote and assess effective climate change adaptation actions and policy.

8 October 2009

Memorandum submitted by the Local Government Association (LGA)

1. INTRODUCTION

1.1 The Local Government Association (LGA) promotes the interests of English and Welsh local authorities—a total of just over 420 authorities. These represent over 50 million people and spend around £74 billion a year on local services.

1.2 The LGA continues to place a strong emphasis on adaptation within its broader environmental work. We continue to work closely with national and regional partners, particularly Local Regional Adaptation Partnership (LRAP), Nottingham Declaration Partnership (NDP), Environment Agency (EA) United Kingdom Climate Impacts Profile (UKCIP) and Department for Environment, Food and Rural Affairs (Defra) on the national Adapting to Climate Change (ACC) programme, in particular supporting the delivery of the performance indicator on climate change adaptation (NI 188), and the statutory programme arising from the Climate Change Act 2008.

1.3 Under our Small Change, Big Difference campaign, we have issued a number of policy statements, and sector guidance. For example in May 2008, the LGA published *Be aware, be prepared, take action*. This guidance was developed by the LGA, Environment Agency and UKCIP and was designed to signpost the tools and resources which local authorities can draw upon in developing their own climate resilience and adaptation strategies.

1.4 In August 2008, the LGA published *Cutting through the green tape—the powers councils have to tackle climate change*. This document aimed to cut through some of the legislative uncertainty (green tape) by highlighting the key powers local authorities have, signposting the tools and resources councils can draw upon and offering some practical examples of those councils that have successfully utilised these powers.

1.5 The LGA therefore welcomes the opportunity to respond to this inquiry and is encouraged by the interest shown by the Committee on this subject.

2. SUMMARY OF KEY LGA POSITIONS

2.1 National Government must empower local authorities to build adaptive capacity, however it is councils, rather than central Government, who should take the lead in deciding what changes are needed in their local area. The specific needs of local communities cannot be understood, prioritised and planned for at a national level.

2.2 We accept that future costs are difficult to judge, but contend that the cost of delivering adaptive change must not fall to local authorities alone. We seek assurances from Government that funds will be available to manage risks that represent a threat over and above existing operations.

2.3 Conversely, the Adapting to Climate Change programme must ensure councils have sufficient leverage over other public bodies and statutory undertakers where necessary to design and deliver robust adaptive action.

2.4 Our aim for 2009–10 is to continue to be the credible advocate for councils on adaptation; encourage raised awareness and maximum use of the UK09 projections, and by working with national partners ensure all local areas understand how climate risks affect core service delivery, infrastructure, assets and the well-being of local communities.

3. POLICY APPROACHES

3.1 The LGA is encouraged by the level of commitment demonstrated by central Government in regards to national adaptation policy. We would call on the Government to be mindful of proposing any actions or measures, which are based on a narrow understanding of the local authorities.

3.2 There are several different types of local authority across England and Wales, each with varied roles, responsibility and funding streams. Policy approaches therefore must not be “one-size-fits-all”, but allow for local, regional needs and vulnerabilities to be understood, identified and accommodated.

4. REPORTING POWER AND NI 188

4.1 During the passage of the Climate Change Bill, the LGA expressed reservations over the need for the Secretary of State to have this Reporting Power over local authorities, given that the expectations under NI 188 are so closely aligned with what reporting authorities would be expected to deliver under legislation.

4.2 We are therefore pleased that the Government have listened to our representations and that the recent consultation proposes that local authorities will not be asked to report under the “first round” of the adaptation reporting power.

4.3 Local government has in place an improvement framework, enshrined in the National Improvement and Efficiency Strategy, which it regards as the primary route for tackling under-performance and improvement in the sector. It is important that the Reporting power is not used as a back door method to circumvent the National Indicator Set or duplicate what is going on elsewhere.

4.4 At present, NI188 is unusual amongst National Indicators in that it is process- rather than outcome-driven. There will of course become a time when the indicator will need to establish more outcome-based requirements. We would assert, however, that Local Authorities must not be unduly singled out because of judgment taken outside of the performance framework.

4.5 We would expect that assessments of whether a local authority should or should not be asked to report to be based on a full understanding of the authority and the challenges it faces.

4.6. Similarly, the LGA through its partnership with organisations such as the LRAP and the NDP will encourage the Government to use the recent submissions from all authorities on NI188 to shape future programmes and generate clear national guidance on adaptation.

4.7 We would seek assurances that any proposed use of the reporting power is taken as a measure of last resort, which does not disproportionately increase the burden of bureaucracy on either local authorities or local stakeholders covered by the definitions.

5. CO-OPERATION

5.1 We are pleased that the recent Government consultation on the Reporting Power recognises that local authorities can provide reports jointly with other organisations where necessary. Effective cooperation will be vitally important across any possible combination of reporting authorities. While, non-cooperation at the local level should be the exception rather than the rule, those exceptions will still need to be addressed in terms of this power being applied to local authorities.

5.2 Local government can report on its own estate and services under its direct control, it cannot and should not be expected laboriously to chase down information in a compatible format from non-council reporting authorities. For example in flooding incidents, the flood waters may arise from multiple sources—sewers, highway drains, watercourses, overland run-off, etc. It is essential that the different bodies with responsibilities for the relevant assets collaborate in the investigation of the causes to resolve problems successfully, ie explain their actions and policies and work with the local authority to make improvements. It is not enough simply to assume through central guidance that reasonable steps will be taken by non-council reporting authorities to co-operate and respond effectively under this proposed duty.

5.3 The Pitt review confirmed what local Category 1 responders (statutory bodies) have long known—that some Category 2 responders (utilities, transport, etc) have hidden behind commercial confidentiality when asked to share information essential for emergency planning. Although the forthcoming Flood and Water Management Bill aims to address this in relation to Flood Risk Management, there will be a need for a more general compulsion on others to co-operate with local authorities.

5.4 It is the LGA's held view that if there local authorities are required to report under this legislation, then the sector must be empowered to require robust and timely co-operation from non-council reporting authorities.

5.5 A more simple way of achieving this would be for regulations to be made under the Civil Contingencies Act 2004 to put a duty on all Category 2 responders to cooperate with Category 1 responders when carrying out duties under the Act.

6. CONCLUSIONS

6.1 Public sector organisations are defined by the services that they are expected to deliver to the public, and they are answerable to Government, and hence to the public, on their performance against targets agreed around these services. Local authorities have a significant interest in adaptation because of the wide range of community services they provide.

6.2 The Local Government Act 2000 gave many local authorities powers to address the overall "wellbeing" of their communities. This gives them an important role in looking at the economic, social and environmental wellbeing of their communities in their role as "place-shapers"—creatively using their powers and influence to promote the general wellbeing of their communities and citizens.

6.3 As democratically elected and accountable local leaders, local authorities also carry overall responsibility for assessing risk and leading the recovery from civil emergencies. As evidenced during the floods in the UK during summer 2007, elements of the response by the privately owned utilities was perceived to show a lack of capacity and capability. Because they are the most competent actor to do so, local authorities need to be put firmly in charge of coordinating planning for emergencies of all key infrastructural services provided in their areas.

6.4 National Government need to empower local authorities by devolving responsibility and funding to them for building local adaptive capacity and undertaking adaptation actions other than particularly large and costly infrastructure projects (such as large sea or river defences). Local authorities are best placed to understand the needs of their local areas because potential climate impacts vary markedly between even small areas for reasons such as variations in topography, local weather conditions, proximity to the coast, land-use patterns and the characteristics of their populations.

6.5 The specific needs of localised communities cannot be defined, prioritised and planned for at a national level. National Government also need to act as clearing houses and conduits of information on adaptation to local authorities. They must also provide the support local authorities need to ensure adaptation is undertaken at local level.

6.6 We accept that future costs are difficult to judge, but contend that this must not fall to local authorities alone. The national Adapting to Climate Change (ACC) programme must work to support councils on both Building Adaptive Capacity (BAC) and Delivering Adaptive Change (DAC).

KEY BACKGROUND DOCUMENTS

- See LGA Small Change, Big Difference campaign
<http://www.lga.gov.uk/lga/core/page.do?pageId=269299>
- "A climate of change: final report of the LGA Climate Change Commission" [LGA, 2007]
<http://www.lga.gov.uk/lga/publications/publication-display.do?id=20630>
- "be aware, be prepared, take action: how to integrate climate change adaptation strategies into local government" [LGA,EA,UKCIP 2008]
<http://www.lga.gov.uk/lga/publications/publication-display.do?id=566301>
- "Cutting through the green tape: the powers councils have to tackle climate change" [LGA,2008]
<http://www.lga.gov.uk/lga/core/page.do?pageId=874285>

8 October 2009

Memorandum submitted by the Campaign to Protect Rural England (CPRE)

INTRODUCTION AND SUMMARY

1. The Campaign to Protect Rural England welcomes the opportunity to contribute to this inquiry. CPRE works for a beautiful and productive countryside which is protected for both present and future generations. We campaign for the more sustainable use of land and other resources and believe that climate change poses a major challenge to the countryside. We are a leading non-governmental organisation in the field of planning and the protection of the countryside and the integration of these with land management policy.

2. In this context, we would like to comment on two of the questions to be addressed by the inquiry:
- *how well the overall direction for work on adaptation has been set, the effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance), the allocation of powers and duties and how well issues like social justice are addressed in adaptation policies;*
 - *funding for specific actions to adapt to climate change, such as investment in flood risk management or the resilience of critical national infrastructure.*

3. In summary, CPRE believes that a number of important “first steps” have been taken to begin to embed climate change adaptation into policy making, but that the pace at which climate change adaptation is going from theory to delivery is seriously inadequate, especially in comparison with climate change mitigation measures. We are also concerned to ensure that the spatial scale at which adaptation measures are designed and delivered is environmentally appropriate. Finally, we feel that the Government needs to do more to tap into the widespread enthusiasm of local communities, particularly in rural areas, to tackle climate change.

COMMENTS ON THE OVERALL DIRECTION FOR WORK ON ADAPTATION

4. From CPRE’s perspective, delivery of physical climate change adaptation measures will take place primarily through two mechanisms—regulation of and payments for land management practices for undeveloped land and the planning system for the built environment. Comments in this section therefore focus on delivery within these two areas.

Land management

5. Environmental land management policy in England, although ultimately delivered on the ground primarily through farming, is developed at a number of spatial scales—the EU via the CAP; England via Defra, Natural England and the Forestry Commission, among others; and at lower levels by a variety of bodies, including land owning charities, AONBs and National Parks. With the exception of National Parks and AONBs and catchment areas, the boundaries which these bodies are responsible for are not often related to the environmental characteristics—such as habitats, soil types, hydrology, and landscape character—which will be affected by climate change. At the same time, there is no single forum at which the wide range of interests which will be affected by climate change in a particular environmental management area—private landowners, water companies, and local authorities, for example—are represented. Because climate change will not respect existing boundaries, there is a major challenge to the effective delivery of adaptation measures.

6. Solving the boundaries problem involves answering two questions—what are the relevant natural boundaries? And, how can existing bodies effectively coordinate over these boundaries? It is CPRE’s view that the most promising approach to the first question lies in addressing adaptation at the landscape-scale. This framework is already the focus of future work on preserving biodiversity,⁴³ and initial analysis suggests that National Character Areas (NCAs) are the most pragmatic unit for identifying priority work on biodiversity. Because NCAs approximate broad habitat areas and in some instances correspond well to other important adaptation priorities, such as “Best and Most Versatile” agricultural land, we consider that NCAs should be explored to discover whether they can fulfil a similar role across climate change adaptation policy.

7. Similarly, we believe that best practice from AONB management structures provides potential lessons for how effective environmental policies can be coordinated across boundaries and in consultation with the wide variety of stakeholders—including landowners, local authorities, environmental stakeholders and others.

Planning

8. The boundaries issue, identified above, is an issue for the planning system as well as for wider land management, and a good example of the potential difficulties in delivering adaptation measures across political boundaries is evident in the take-up of National Indicator 188 across different local authorities. The map below⁴⁴ shows the local authorities that have selected NI188 as a priority next to a map showing NCA boundaries.

9. The fragmentation of the take-up of NI188 demonstrates that there is significant potential for landscape-scale adaptation measures to be complicated by problems of cross-border working amongst local authorities, especially for spatial planning across NCAs that fall between local authorities that have not chosen NI188 as a priority. In fact, future problems may already be developing: we are aware that UKCIP training on how to understand climate projections is limited to those local authorities that have chosen NI188 as a priority measure.

⁴³ Natural England (2008), *Securing Biodiversity*, Catalogue No NE127.

⁴⁴ Not printed.

10. The difficulties with relying on NI188 to deliver effective climate change adaptation at a local level are also increased by the lack of guidance available on how to deliver NI188. Interestingly, guidance on how to fill out the self-assessment matrix which is used to report on progress on NI188 is available,⁴⁵ but over a year after NI188 was adopted as performance indicator, guidance and best practice examples of actual adaptation delivery is still lacking. In this context, it should come as no surprise that 53% of councils have only achieved level 1 of NI188, a level at which local authorities “will probably not expect to be in a position to implement many adaptation actions.”

11. Although NI188 is usefully focused on a broad range of policy areas, it suffers from a significant defect—it fails explicitly to require democratic engagement with the local communities that will be affected by climate change. Not only does this create a risk that adaptation policy will not be embraced by the community, it misses a major opportunity to use climate change adaptation as a means of showing that climate change is relevant to the lives of ordinary people. Adaptation policy is particularly valuable in this regard because it is fundamentally concerned with maintaining elements of the human environment—cities that are cool in the summer, moorland that can prevent flooding, wildlife and landscapes that are essential to well being—that contribute to individual and community quality of life.

12. By failing to promote community engagement, NI188 also fails to recognise that individual and community behavioural change will be essential in delivering effective adaptation policy as many of the changes required are outside local authority control. Unlike mitigation measures, which could in principle be delivered through big-kit technical fixes like renewables and other low-carbon power sources, effective adaptation will depend on action that is outside the immediate control of Government, such as preventing soil sealing on private land, enhancing biodiversity in gardens, increasing insulation in existing properties and promoting water efficiency at the household level.

13. Furthermore, as the slow pace of delivery on NI188 shows, a substantial amount of work needs to be done to develop effective policies to support climate change adaptation. Experimentation over adaptation approaches is needed and tapping into the experience and perspectives of local communities through effective engagement can go some way to help with this. However, it is unlikely that a coherent set of adaptation measures will be developed quickly. Because of this, the overarching framework within which adaptation policy is pursued needs to allow for increased flexibility and a risk-based approach to policy development.

14. In the planning system, useful examples of local approaches to climate change mitigation such as the Merton Rule and Milton Keynes policy on carbon-neutral development⁴⁶ show that local approaches can deliver tangible benefits for climate change mitigation, but that a lack of flexibility has been a barrier to the effective roll out of new policies. CPRE believes that enabling local authorities to develop adaptation policies more quickly is essential in meeting future adaptation needs.

15. In the medium term, it is clear that we need a fundamental rethink of the way in which the planning system works. At present, the system is designed on the assumption that the natural environment is essentially static. Climate change projections show that this is not the case, but these projections are as yet insufficiently precise to provide certainty about the detail of future climate patterns. Because new projections are likely to be produced as the evidence base improves and changes, the planning system will need to be flexible enough to incorporate new evidence quickly, and will also need to move to a risk-based model that encourages greater resilience in response to a dynamic natural environment. One way of exploring how to reform the planning system which CPRE would support would be through a commission to explore ways in which strategic planning can lead the delivery of a climate proofed, low-carbon future.

16. From CPRE’s perspective, a clear example of where this approach would be most valuable in the shorter term relates to soil protection. Defra’s recently released soil strategy for England, *Saving our Soils*, goes some way to adopting a flexible methodology which enables a periodic review of cross-compliance measures to incorporate new scientific evidence. However, the strategy is insufficiently robust in its interpretation of resilience. Globally, the combination of climate change and an increasing world population is likely to lead to greater demand for food, and an increasing danger that food imports may be subject to interruption.⁴⁷ In this context, CPRE would like to see the Best and Most Versatile (BMV) land planning policy updated and reinforced to ensure that the high grade agricultural land that may be necessary for future food production is protected. This update needs to go further than a simple reassertion of the value of protecting BMV land to promote new national planning policies and mechanisms to secure this objective and to incorporate a reassessment of the value of soils for agriculture in the context of likely changes to the climate, and the related role that soils can play in enhancing biodiversity and controlling flooding.

⁴⁵ See <http://www.lga.gov.uk/lga/core/page.do?pageId=1382860>

⁴⁶ In the case of Milton Keynes, the policy development process took a total of five years, due in part to objections that “the local authority was exceeding its planning powers [and] that the requirement for carbon neutrality had no basis in Government guidance.” See http://www.southeastexcellence.co.uk/casestudies/sustainability/?p_id=1347 for further details.

⁴⁷ See, for example, Thinking About the Future of Food: The Chatham House Food Supply Scenarios, available from http://www.chathamhouse.org.uk/files/11622_bp0508food.pdf. Professor John Beddington also warned earlier this year of a “perfect storm” of food and energy shortages, see <http://news.bbc.co.uk/1/hi/uk/7951838.stm> for details.

FUNDING

17. A brief overview of the funding available for climate change shows a substantial imbalance between mitigation and adaptation measures. At the EU level, CPRE supports an increase in the range of measures available to farmers to address the “new challenges” that were recently agreed as part of the Health Check of the CAP, including those arising from climate change. However, we are concerned to ensure that an appropriate balance between funding for mitigation and adaptation measures is secured. Any additional funding allocated to addressing the new challenges should not result in a decline in funding that is needed to meet the full range of existing priorities for agri-environment schemes.

18. At the national level, as the National Audit Office report commissioned for this enquiry shows, a total of £11 million has been made available to Defra for climate change adaptation work over two years. In contrast, the Severn Barrage, a single mitigation project, could cost between £15 and £23 billion, much of which would need to be underwritten by the public. Funding for mitigation measures is clearly important, and over the last few years organisations such as the Carbon Trust⁴⁸ have built a body of evidence that mitigating climate change will deliver net economic benefits to the UK, evidence which alongside public funding has influenced business to invest in mitigation. In contrast, relatively little work has been done at a national level to quantify the potential savings that effective adaptation policy could create, when compared with the costs of retrofitting in the future or rebuilding after extreme weather events.

19. At the local level, examples such as the flooding in Gloucestershire in 2007 show the potential scale of future costs arising from climate change. The costs of this single event were greater than £50 million to affected local authorities alone, and substantial funding has now been directed toward improving flood defences in the county. Although a focus on preventing future flooding in Gloucestershire is valuable, there is a danger that short-term funding will focus on adding resilience in a reactive way, rather than allocating funding based on future risks. The fact that Gloucestershire County Council will receive around £25,000 for 2008–09 and 2009–10 in area based grant to support the delivery of 35 NI targets, of which only one—NI188—relates to climate change adaptation shows the relative lack of funding for developing and delivering an effective plan to adapt to climate change. It is our understanding that increased funding for climate change adaptation in Gloucestershire would go toward identifying the vulnerability of critical infrastructure to climate change; vulnerability which is currently unaccounted for in future planning.

20. Finally, we are concerned that much of the good work that existing funding streams—notably to UKCIP for both climate change projections and for local authority training—have achieved may not be taken forward if adequate funding is not secured over the medium term. Because funding for adaptation has so far been focused on projections and supporting a better understanding of how to use these projections, substantial work is still needed to understand how projections will affect infrastructure and to develop and publicise best practice examples of climate change adaptation so that effective adaptation policy can be delivered.

9 October 2009

Memorandum submitted from the British Geological Survey (BGS)

1. SUMMARY

1.1 This response from the British Geological Survey (BGS) to the Environmental Audit Committee (EAC) inquiry of adaptation to climate change sets out:

- A brief background to the BGS and its role in supporting government policy in earth sciences and environmental management.
- Comments on elements of the National Audit Office (NAO) report prepared for EAC.

2. BACKGROUND

2.1 The BGS is part of the Natural Environment Research Council (NERC), and is the nation’s principal supplier of objective, impartial and up-to-date geological expertise and information for decision making for governmental, commercial and individual users. The BGS carries out research in strategically important areas including energy and natural resources, vulnerability to environmental change and hazards, and earth system science, often in collaboration with the national and international scientific academic community. In this way the BGS maintains and develops understanding of earth sciences to improve policy making, enhance national wealth and reduce risk.

2.2 BGS undertakes surveying, modelling, research and environmental and geological monitoring to deliver UK and NERC science objectives. It also works overseas, where it plays an important role in building geological infrastructure and capacity in developing countries.

2.3 Our annual budget is in the region of £53 million, a little over half of which comes from the UK government’s Science Budget, with the remainder coming from external commissioned research.

⁴⁸ See, for example, a recent article by Tom Delay, the Chief Executive of the Carbon Trust, which highlights the economic benefits of climate change mitigation: <http://www.guardian.co.uk/environment/cif-green/2009/jul/02/low-carbon-economy>

3. COMMENTS ON THE NAO REPORT OF ADAPTATION TO CLIMATE CHANGE

3.1 *Natural hazards*

3.1.1 The impact of climate change is one of the biggest and most complicated challenges facing society today. It is vital that research into climate change addresses the magnitude and frequency of impacts from natural hazards such as landslides. Currently there is very limited temporal data on these events (especially landslides) and this has to be addressed before a good indication of the magnitude and frequency of natural hazards can be undertaken.

3.1.2 Climate change impacts are not just the change in temperature or precipitation, but the impacts of those events on the natural environment, eg the secondary effects. This is not clear in the NAO review and should not be forgotten. For example, in urban areas, the highest priorities are likely to be (for example):

- increased surface water run-off (from higher intensity rainfall) and surface water flooding;
- sea level rise and storm surges in coastal cities;
- rising groundwater levels with respect to buried utilities; and
- remobilisation of contaminants from changing groundwater levels and the resilience of engineered infrastructure to changes in environmental properties.

3.1.3 As a result, adaptation policies need to take a very holistic view of the surface and sub-surface earth system to measure impacts properly. Adaptation strategies cannot be restricted to the surface alone as this will not give a true picture of sustainability. This again needs to be highlighted as there is too much emphasis on surface effects in the NAO review.

4. GROUNDWATER SCIENCE

4.1 The departmental reports within the review that relate to the work of Groundwater Science are DEFRA, DIUS and DECC. Their two-page summaries seem to capture the issues at the highest level and addition of detail would be inappropriate. Research into the environmental issues is covered at the highest level through the Living With Environmental Change (LWEC) programme but we are unable to comment if the programme is being implemented in the most expeditious or effective manner.

5. DEPARTMENTAL APPROACHES TO MITIGATING MANAGING RISKS ASSOCIATED WITH CLIMATE CHANGE

5.1 The BGS is not in a position to comment on the individual departmental approaches set out in the NAO review to managing risks associated with climate change or the suitability of these procedures. However, a longer-term aim is—through the recently established BGS Government Advisory Panel—to engage more effectively with central government to inform and support policy development and implementation across a range of departments (eg DECC, MoD, BIS, DEFRA, DfT, DfID, FCO). This will include working with government to help mitigate the effects of climate change.

15 October 2009

Memorandum submitted by the National Farmers' Union (NFU)

SUMMARY

1. We are the largest organisation representing agricultural and horticultural businesses in England and Wales. Our members are farmers, growers and land managers and, consequently, they are at the forefront of climate change impacts. The industry also considers itself to be part of the solution to climate change through its role in harnessing and exporting low-carbon renewable energy services.

2. Through their capability to adapt to gradual change, UK farmers and growers will respond to the challenge of future food production. However, whilst adaptation to gradual changes is relatively easy to undertake, and may not cost much, adaptation to low-probability catastrophic events may be very costly and anticipatory adaptation may even be impossible. The NFU believes that that capacity-building and regulatory flexibility to cope with extreme weather events should be a future priority.

3. Adaptation responses required of agriculture must be cognisant of the complexity of economic and public policy goals facing the industry.

4. There is a need for a continuation of capacity-building activities in the agriculture sector, underpinned by investment in agricultural science, a shift to focus on production, and the strengthening of resources and facilities for knowledge transfer.

5. The NFU strongly advocates a fully joined-up approach to identifying, mitigating and managing climate change risks in and across Government Departments and their agencies.

MAIN RESPONSE

This consultation response sets out the National Farmers' Union (NFU) view of adapting to climate change and addresses some of the issues highlighted by the Committee in its call for evidence.

THE NFU AND ADAPTING TO CLIMATE CHANGE

6. The NFU represents 55,000 farm businesses in England and Wales involving an estimated 155,000 farmers, managers and partners in the business. The NFU's policy on climate change entails viewing this as an opportunity rather than a threat to our sector and encourages farmers to adapt and diversify into harnessing and exporting low-carbon renewable energy services in order also to play a role in the mitigation of climate change.

7. Farmers are on the frontline of climate change and adapt to the weather on a daily and yearly basis. Furthermore, they also make adaptations from generation to generation, eg through the introduction of new varieties and new crops. The NFU has been engaged with Government on this subject over the past five years. Through their capability to adapt to gradual change, UK growers will respond to the challenge of future food production. We are in agreement with the observation in the NAO review⁴⁹ that there may even be opportunities for our sector to exercise a comparative advantage over our competitors, eg in water availability, as a result of the projected moderate changes to our climate.

8. In 2005, the NFU conducted a survey on the weather and climate change. The results exemplified the importance of weather to the farming community as the weather-recording period was on average 22 years, with some farms having records going back 65 or even 100 years. 97.7% of the respondents to the survey agreed with the UKCIP02 scenarios for climate change.

9. Adaptation to climate change is very much dependent upon the way in which impacts appear, whether as gradual changes or by catastrophic events. Adaptation strategies can also be very diverse, specific to given time and location. While adaptation to gradual changes is relatively easy to undertake, and may not cost much, adaptation to low-probability catastrophic events may be very costly and anticipatory adaptation may even be impossible. The NFU believes that that capacity-building and regulatory flexibility to cope with extreme weather events should be a future priority.

10. The NFU has been a leading participant in a number of sector initiatives addressing both adaptation to and mitigation of climate change. The Climate Change Task Force report⁵⁰ presented proposals for the rural sector and Government to act on climate change and reduce greenhouse gases from agriculture. We are also a key member of the Farming Futures project⁵¹ which raises awareness amongst farmers of climate change impacts, adaptation and mitigation.

The suitability of the processes and structures in and across Government Departments for identifying, mitigating and managing climate change risks

11. The NFU strongly advocates a fully joined-up approach to identifying, mitigating and managing climate change risks in and across Government Departments and their agencies. Addressing water management issues—considering flood and coastal erosion risk, water resource and water quality—provides a good example of where this is not the case.

12. In our response to the recent draft Floods and Water Bill, we highlighted our concerns about the changes to the reservoir safety regime that the Bill contains. We agreed that a risk- rather than standards-based approach to reservoirs is the right way forward and were pleased it would lead to significant de-regulation for owners of low-risk, large reservoirs. But we argued that the inclusion of all reservoirs of over 10,000 cubic metres within the revamped regime was, to be blunt, using the proverbial hammer to crack a nut.

13. Many small reservoirs are on-farm irrigation reservoirs, sited away from urban populations and critical infrastructure. These on-farm reservoirs are encouraged by the Environment Agency and others as a way of using water more efficiently and reducing the environmental impacts of summer abstractions. If water is needed for irrigation of crops, on-farm storage reservoirs can store water abstracted in the winter period and the water can then be used in the summer to help meet peak demands. They therefore provide an excellent example of adaptation to climate change. As the Environment Agency says in its recent Water for People and the Environment publication, "Having suitable sites available for reservoirs and access to funding will be important in managing water resources, particularly for agriculture".⁵²

⁴⁹ http://www.nao.org.uk/publications/0809/adapting_to_climate_change.aspx

⁵⁰ The Climate Change Task Force consists of the NFU, the Country Land and Business Association (CLA), and the Agricultural Industries Confederation (AIC) The report is available at <http://www.nfuonline.com/x24741.xml>

⁵¹ A collaborative communications project involving the AIC, Agriculture and Horticulture Research Forum, CLA, Forum for the Future, NFU and DEFRA: www.farmingfutures.org.uk

⁵² <http://www.environment-agency.gov.uk/research/library/publications/40731.aspx>

14. However, if what is proposed in the draft Bill is implemented without regard for the potential burden it will place on existing and future owners of small on-farm irrigation reservoirs, there is a real risk that what the Government are encouraging with their water resources arm will be made considerably less attractive by their flood risk management arm. This is hardly in line with the holistic, integrated approach to water issues that would deliver successful adaptation.

15. We are concerned that in DEFRA's self-assessment of its progress on adaptation in the NAO review that it did not identify any key partners in the food and farming sector—a surprising omission.

The effectiveness of the statutory framework (including the use of the Reporting Power and its accompanying statutory guidance)

16. In our response to the consultation on the Adaptation Reporting Power⁵³ the NFU was very pleased to see that the importance of the food sector to the adaptive capacity of the UK was recognised. We acknowledged that the food sector is made up of a large number of businesses. The farmers and growers of the UK represent thousands of small- and medium-sized businesses and a requirement to report would be, as the Reporting Power consultation recognised, disproportionate. In line with the principles of Better Regulation, adaptation reporting by public authorities and/or regulators should be limited to their own actions and not necessarily those that they regulate.

17. However, we urged the Government to emphasise the need for reporting authorities (both priority organisations and those invited to voluntarily report) to consult other stakeholders to reflect particular inter-relationships. Section 1.19 of Annex B of the consultation suggested that “authorities need to work in partnership with other organisations, and their process should include some form of consultation with interested parties, particularly when considering what measures to take to adapt”. The NFU feels that where integral linkages exist between reporting authorities and food producers—not only in the food sector, but also for water, energy, environment and the natural environment—there should be a requirement to consult farmers. This is especially relevant “when considering what measures to take to adapt”. Successful on-farm adaptation strategies will need to be diverse, specific to a given time and location, and dependent on the economic, environmental and social costs and benefits to the farm business.

The funding, support, training and other resources available, including at a local and regional level, for: building capacity to adapt to climate change

18. Since its launch in 2006, the Farming Futures project has been funded by DEFRA, and match-funded by in-kind contributions by the other project partners. The project has delivered 24 fact sheets and 21 case studies addressing the impacts, challenges, opportunities and suggested adaptations and mitigations for each farming sector; three video case studies; over £375,593 advertising value equivalent in key farming publications; and 11 on-farm workshops for farmers and land managers reaching over 350 delegates. DEFRA highlights its funding of Farming Futures as an example of its response to the risk presented by climate change but the Department has not committed to funding the project beyond March 2010.

19. There are a range of climate change initiatives in existence operating at different levels and the NFU wonders if there are opportunities for greater collaboration and co-ordination with existing delivery mechanisms. Examples include:

- DEFRA's support of the established Farming Futures project whilst simultaneously targeting the agriculture sector with its Act on CO₂ campaign.
- New communications activities targeted at the agriculture sector by regional and county climate change partnerships and action plans.

20. Recent decades have seen a serious running down of investment in agricultural science, a shift in focus away from production, and the undermining of resources and facilities for knowledge transfer, which would allow farmers to benefit from research and development on the ground. This at a time when the world population is expected to exceed nine billion by 2050 and climate change is expected to impact global food production. The NFU consequently launched its Why Science Matters for Farming campaign⁵⁴ to highlight the demands, challenges and opportunities facing British agriculture in the future.

22. Current projections suggest that, for example, future sugar beet yields may halve in East Anglia due to water shortages, demonstrating the importance of the crucial work scientists are undertaking in producing more drought resistant varieties for a future under climate change. The NFU would therefore like to see an increase in public funding of agricultural research budgets alongside support for the role the Agricultural and Horticultural Development Board can play in agricultural R&D, and in particular in promoting translation of agricultural research into practice.

23. We would also like to highlight that other initiatives in the agriculture sector make a contribution to climate change adaptation eg the Campaign for the Farmed Environment will enhance habitat for farmland biodiversity and increase connectivity in the landscape.

⁵³ <http://www.defra.gov.uk/corporate/consult/climate-change-adapting/consultation.pdf>

⁵⁴ <http://www.whyfarmingmatters.co.uk/Documents/Why%20Science%20Matters%20For%20Farming%20Report.pdf>

Monitoring and evaluation of work on adaptation, including thoughts on how progress on adaptation can be quantified and success measured

24. The NFU agrees with the NAO's observation that measuring progress on adaptation is difficult. UK farmers and growers are consciously and sub-consciously already adapting to climate change. For example, farmers are planting crops earlier in response to warmer temperatures, improving irrigation efficiency in preparedness for hotter, drier summers and, as a result of the flooding events in 2007 and 2008, considering the resilience of crops over yield. However, this proactive/reactive change in behaviour is not branded "climate change" adaptation; it is simply a habitual response to "weather" and circumstance. Such small-scale, almost imperceptible, changes in farming practice, whilst important in successfully delivering business resilience to climate change, will be very difficult to quantify.

15 October 2009

Memorandum submitted by the Association of British Insurers (ABI)

The Association of British Insurers (ABI) is the voice of the insurance and investment industry. Its members constitute over 90% of the insurance market in the UK and 20% across the EU. It controls assets equivalent to a quarter of the UK's capital. It is the risk manager of the UK's economy and society; through the ABI, their voice is heard in Government and in public debate on insurance, savings, and investment matters.

INTRODUCTION

The ABI has promoted adaptation for some time. We believe the predicted changes in the climate pose a threat to the economy and to our way of life. In 2007, the summer floods alone caused more than £3 billion of insured damage and the total disruption to the economy was far greater. The Stern Review shows that taking action now will be more cost-effective than taking action later.

The ABI welcomes the Government's work on adaptation. The draft Flood and Water Management Bill is an important step to make England and Wales safer from flooding. Delivering and securing legislative approval of the Bill is one of the key milestones in the ABI-Government agreement on the future of flood insurance in England.

However, we believe that the issue of adaptation must be pursued with more energy.

SUMMARY

- The Environment Agency's long-term investment strategy shows that even if spending on flood defences is increased by £20 million per year (until 2035), flood risk will still only remain at current levels. Therefore, we cannot afford not to invest in flood defences. Insurers can only continue to provide cover for properties where the flood risk is adequately managed.
- As in the Climate Change Act, the ABI would like to see clear legally-binding targets for adaptation, particularly the number of homes and businesses at risk from flooding.
- There should be a clear public scrutiny process of how local authorities, the Environment Agency and the Government deliver on their adaptation objectives.
- It is important that new developments are built to withstand the challenges faced by climate change.
- We need to create an open culture of sharing information between all stakeholders and increasing risk awareness.

FUNDING

1. We cannot afford not to invest in flood defences. The Environment Agency has recently published its long-term investment strategy which shows that an additional £20 million per year (until 2035) of investment is required just so the same number of properties can be protected as today. In other words, a doubling of expenditure will not reduce the problem.

2. Our own research shows that adaptation investment can be very cost-effective: for example, flood defence expenditure in the UK has a cost-benefit ratio of 7:1, much higher than for other public sector capital investments.

3. The ABI welcomes Defra's and the Environment Agency's work on the long-term investment strategy and we will engage in the public debate about future investment needs.

MONITORING AND EVALUATION OF WORK ON ADAPTATION

Targets

4. The ABI welcomes the Climate Change Act, which sets clear, legally-binding targets to reduce carbon dioxide emissions. The Government should take a similar approach to reducing the number of properties and businesses exposed to flooding. It should set legally-binding targets for reducing the number of homes and businesses at different levels of flood risk by eg 2015, 2025 and 2050, following the precedent set in the Climate Change Act. We hope this will be included in a future Flood and Water Management Bill.

Public scrutiny and accountability

5. The draft Flood and Water Management Bill sets out new responsibilities and duties for the Environment Agency and Local Authorities, as recommended in the Pitt Review. It is essential to develop a clear public scrutiny process of how the Environment Agency, national Government and Local Authorities perform and deliver on the new duties set out in the draft Bill. Otherwise, it is difficult to hold the Government and Local Authorities democratically accountable and there is a risk that it is only apparent that flood risk is not being managed adequately when an avoidable flood event happens, and by then it is too late.

REDUCING THE NUMBERS OF HOMES AT RISK FROM FLOODING

6. 1 in 6 homes is at risk from flooding. As mentioned above, even if the Government spends £20 million a year for the next 25 years on flood defences, the level of protection will still only remain at today's levels. It is essential to manage this risk by: offering advice and information to the public; providing clear guidance to developers; making high-risk homes more resilient to flooding; and producing research to help understand the risk.

Regulation of new developments

We must not allow new developments to create additional flood risk.

7. The ABI has recently published its Guide on Insurance Issues for New Developments to help ensure that new developments will stand up to the challenges posed by climate change. This guide can be found on the ABI's website (www.abi.org.uk).

8. Insurers want to be able to continue to offer affordable property insurance to as many people as possible. This is important because without insurance, mortgages are difficult to obtain and properties are virtually unsellable. However, to achieve this, the risk must be managed.

9. The ABI's key messages for new developments are:

- Buildings must be located and designed to ensure that they are able to withstand climate change—particularly increased flood risk.
- Insurers will only be able to insure buildings—vital to ensure that they are sellable—if this risk is managed to acceptable levels.
- We recommend that developers:
 - Follow National Planning Policy Statements.
 - Provide buyers with information on climate risks and how they are managed.
 - Develop publicly-available standards or kitemarks that certify enhanced resilience to climate change impacts.
 - Before buying a property in a new development, prospective owners should check the flood risk and obtain information on measures taken to reduce it.

IDENTIFYING RISK AND INFORMATION SHARING

10. We need to create an open culture of sharing information between all stakeholders and increasing risk awareness. The information gathered under the EU Directive—preliminary flood risk assessments, flood hazard maps, flood risk maps and flood management plans—needs to be communicated effectively to the public. To ensure that flood insurance remains as affordable and widely available as possible, it is also important that this information is provided to insurers, in a convenient administrative format.

Memorandum submitted by the Institute of Environmental Management and Assessment (IEMA)

SUMMARY

- Adapting to unavoidable climate change is essential for all parts of the UK economy.
- Companies need to see a coherent business case for taking action to adapt to a changing climate. This requires a greater awareness of the business risks and opportunities.
- Insufficient effort is going into promoting the business case for adaptation. More needs to be done to align the publicly funded business support system to this agenda to ensure businesses understand the case for instigating adaptation activity.
- Environment professionals employed across all sectors of the economy are already integrating adaptation activity into their organisations and have a significant role to play in ensuring businesses minimise risk and maximise opportunities from a changing climate.

INTRODUCTION

1. The Institute of Environmental Management and Assessment (IEMA) is a professional body of environment practitioners; our vision is to promote the goal of sustainable development through improved environmental practice and performance. Of a membership that exceeds 14,500, over 52% are employed in business and industry across all sectors of the economy, 26% are in consultancy, 10% in the public sector and 12% in education. IEMA members largely work on a broad range of multi-disciplinary environmental issues, including climate change mitigation, adaptation and resource efficiency.

2. IEMA welcomes the Committee's inquiry into climate change adaptation. While IEMA strongly believes that there needs to be a focus of activity on reducing greenhouse gas emissions to mitigate the impacts on climate, we also recognise the importance of adapting to unavoidable climate change and the benefits that early action will bring. IEMA is supportive of provisions in the Climate Change Act 2008 on adaptation, including the statutory requirements on public bodies and statutory undertakers to report on their assessment of risks from climate change and the statutory requirement for a national climate change risk assessment.

3. IEMA recognises that for mainstream business, action on climate change adaptation will be self-determined and there are no plans to instigate legal requirements or duties to adapt. As such, action to support adaptation in the business community needs to be focussed on demonstrating the value and benefits of planning for adaptation and instigating early action; otherwise UK business will be poorly prepared and exposed to greater risk than would otherwise be the case, potentially making them less competitive.

4. As part of the environment profession's contribution to climate change adaptation, IEMA has worked closely with the UK Climate Impacts Programme to support the development and sharing of adaptation knowledge and understanding. This has included the publication of an IEMA practitioner guide on managing adaptation in organisations,⁵⁵ together with a series of workshops throughout the UK to engage more directly with environment professionals and support their continual professional development.

5. In responding to the Committee's inquiry, we have focussed on action that needs to be taken to help business to adapt to climate change and support that could be provided to ensure that organisations are adapting well. In addition, our response draws on the results of a climate change adaptation survey of environment professionals in IEMA's membership, and the extent to which members' organisations are planning for adaptation and the barriers they face.

GETTING THE ADAPTATION MESSAGE OUT TO BUSINESS

6. With the exception of statutory undertakers, such as water and energy companies, businesses will be responsible for determining their own response to a changing climate. Companies will need to identify and assess their climate change risks, and develop and implement plans as appropriate to mitigate those risks. In terms of reporting, the 2006 Companies Act requires quoted companies to include in their business review a description of the principal risks and uncertainties facing the company including environment matters; this may include risks from a changing climate.

7. IEMA believes that this voluntary approach to adaptation in business is the right one. While emissions from companies have the potential to impact on the health of people and the broader environment and so are subject to legal and other safeguards, with the exception of critical national infrastructure, the impact of a changing environment is largely of relevance to shareholders and employees. Therefore, it is largely in the self-interest of businesses to adapt to climate change.

8. However, for this market-based approach to climate change adaptation in business to be successful, companies first need to recognise the business case and the potential risks and opportunities that arise. IEMA is concerned that too few companies will be aware of the business need to consider climate change

⁵⁵ Johnstone K, Brown A & Goldthorpe M (2009) *Adapting to Climate Change: a guide to its management in organisations* IEMA Practitioner Series Vol 13 July 2009, Institute of Environmental Management and Assessment, Lincoln, UK.

adaptation; fewer still will take action to evaluate and manage their risks. Experience in the area of business resource efficiency indicates that, even where there are significant potential cost savings to be made which would directly improve profitability, many companies fail to recognise the potential or take action. The likelihood is that climate change adaptation will suffer from even less engagement, because the direct benefits to a business are likely to be far less certain.

9. IEMA believes that there is a strong business case for companies considering climate change adaptation, both in reducing risks and acting on opportunities. However, far more needs to be done to promote and articulate the case.

OVERCOMING THE BARRIERS

10. IEMA recognises that adapting to climate change is not solely a role for environment professionals and that adaptation needs to be integrated into mainstream business management processes, including corporate risk management and business continuity planning. However, we believe that environment professionals have an important role to play in helping businesses to understand the environmental context within which a business operates and engage others in their organisation to integrate adaptation thinking into their work.

11. A survey by IEMA⁵⁶ of environment professionals at the end of September 2009 gives a snapshot of activity on climate change activity. Overall, there is a high level of engagement in *planning* for adaptation (62%⁵⁷). Of particular note is the sector breakdown of members' organisations planning for adaptation: construction 64%; manufacturing 64%; electricity, gas and water supply (76%); transport, storage and communication (65%) and local government (90%). This level of engagement is significantly beyond what might be expected of organisations in the economy as a whole, but it does highlight the value that environment professionals can add in terms of instigating environmental and organisational change.

12. The survey also characterised the extent to which adaptation planning had identified threats and opportunities in the areas of:

- Markets—changing demand for goods and services.
- Finance—implications for investments, insurance and reputation.
- Logistics—vulnerability of supply chain, utilities and transport arrangements.
- Premises—impacts on building design, construction and maintenance and facilities management.
- People—implications for workforce, customers and changing lifestyles.
- Process—impacts on production processes and service delivery.

13. The most frequently identified risk area was in relation to premises (57%); risks associated with logistics (44%) was the area least likely to have identified.

14. However, IEMA is aware that there are a number of barriers to instigating action to reduce climate change risk, even when companies recognise that adaptation is a potential issue and risks are identified.

15. Although a high proportion of members' organisations were *planning* for climate change adaptation, a number of significant barriers to instigating adaptation *activity* were identified. Barriers included lack of resources, lack of engagement and a limited understanding of the nature and extent of the risks and vulnerabilities. The results indicate that the significance of the barriers is partly dependent on the sector of the organisation. For example, lack of resources is a significant barrier for 67% of respondents in local government, compared with only 32% in electricity, gas and water supply. In the transport, storage and communication sector, both lack of resources and a limited understanding of the nature and extent of the risks and vulnerabilities are rated as being of high significance by over 40% of respondents. 50% of those in the construction sector scored limited understanding of the nature and extent of the risks and vulnerabilities as being the most significant barriers.

16. We believe that there is a strong link between the different internal barriers. Support needs to focus on engaging people internally and explaining the nature of risks; without this, resources won't be made available to instigate action, particularly when set against short-term business survival during the recession. The behaviour and culture change that is required to ensure adaptation becomes embedded in organisations will not happen overnight. Environment professionals are well placed to ensure that action is sustained over a long period of time.

⁵⁶ IEMA membership survey on adapting to climate change—report due for publication in November 2009.

⁵⁷ Note should be made that the results of the survey are a reflection of adaptation activity in organisations that employ IEMA members as environment and sustainability professionals.

17. The implications arising from the survey are also that different sectors will require different types of support in order to overcome barriers to undertaking adaptation activity. While we are aware of some sector specific activity that has been undertaken by the UK Climate Impacts Programme (UKCIP), the development of tools to help overcome barriers to adaptation activity are likely to be required.

BUSINESS SUPPORT & SKILLS DEVELOPMENT

18. The Government's recent consultation "Adapting to Climate Change: ensuring progress in key sectors. Consultation on the Adaptation Reporting Power in the Climate Change Act 2008" stated that:

"Adaptation needs to be built into planning and risk management now to ensure the continued and improved success of businesses, Government policies and social and environmental operations. All organisations should therefore be considering the risks to their operations of climate change, and the actions that they consider necessary in order to adapt to climate change. In this way we can all be assured that the country is making progress in successfully adapting to a changing climate."

19. We are in strong agreement with this statement. However, if business is to play its full part in the climate change adaptation agenda, then all relevant opportunities need to be taken to increase awareness and stimulate action.

20. IEMA's evidence to the Committee's recent inquiry into Green Jobs and Skills highlighted the failure of the Government's business support programme and the skills delivery framework to help to mainstream environmental knowledge and skills across all sectors of the economy. We believe that the same failures will be repeated on mainstreaming the climate change adaptation agenda.

21. The Government's gateway to business support is through Business Link's Information, Diagnostic and Brokerage (IDB) service, with an estimated 500,000 interventions per year. We are concerned that Business Link Advisors will lack knowledge and understanding on climate change adaptation and therefore miss opportunities to provide support to businesses.

22. In addition, although there are many Government programmes providing support for business on different aspects of the environment, eg Carbon Trust, Envirowise, National Industrial Symbiosis Programme (NISP) and WRAP, none of these provides support on climate change adaptation. Consideration should be given to integrating climate change adaptation into existing environment support programmes, particularly through supply chain engagement. In addition, we believe there is considerable merit in exploring provision of a more holistic, single programme of environmental support to business that incorporates climate change adaptation, mitigation and business resource efficiency.

23. IEMA believes that many of the skills that are required to integrate climate change adaptation planning and action into businesses are generic in nature, including project management, communication, risk assessment and finance. Any "skills gap" in relation to climate change adaptation is therefore likely to be around knowledge and understanding. Therefore, the focus of any training and support needs to be on mainstreaming adaptation knowledge and understanding across all sectors of the economy. At present, there is no programme to ensure that climate change adaptation is considered by all of the Sector Skills Councils. IEMA believes that the UK Commission for Employment and Skills should be mandated to ensure that climate change adaptation knowledge and skills are embedded across all parts of the skills delivery framework.

ENVIRONMENTAL ASSESSMENT

24. The current European directive on environmental impact assessment (EIA)⁵⁸ for certain developments, and its implementing regulations in the UK, require project developers to predict the likely significant impacts on the environment and propose measures to mitigate adverse environmental effects. At present, there is no explicit requirement for an assessment of the impact of a changing environment.

25. IEMA believes that consideration should be given to how best to ensure adaptation is built into new developments and project decision-making. For example, a duty could be included in the EIA regulations for project proponents to include an assessment of the impact of climate change in their environmental impact statements. This is important to ensure that new developments do not increase the UK's climate change vulnerability.

26. In addition, strategic environmental assessment (SEA)⁵⁹ and sustainability appraisal are required for certain plans and programmes. However, at present there is no link between these assessments and the need to evaluate climate change risks. IEMA believes that Government should consider how best to integrate climate change adaptation into the EIA and SEA regimes.

⁵⁸ European Directive 85/33/EEC as amended by 97/11/EC on the assessment of the effects of certain public and private projects on the environment.

⁵⁹ European Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment".

CONCLUSION

27. The UK is vulnerable to a changing climate and it is essential that action is taken by all parts of the economy to consider their risks and take appropriate measures to adapt. In order for companies successfully to embrace the adaptation agenda, more needs to be done to raise awareness of the business case. IEMA believes that environment professionals have a significant role to play in helping businesses to integrate adaptation activities into their business management processes and to help to mainstream adaptation thinking throughout the economy.

20 October 2009

**Memorandum submitted by the Grantham Institute for Climate Change
at Imperial College London**

SUMMARY

- There is a dangerous perception in the impacts and policy communities that the climate projection problem is essentially solved. However, there can at present be little confidence in projections for UK regions on decadal time-scales.
- Moving adaptation higher on the agenda is a necessity but must not deflect from the priority for mitigation. Both are needed and adaptation strategies also need to take into account mitigation priorities, particularly in terms of agriculture and water.
- The quality of information available for adaptation decisions in the UK is not currently high, despite the progress made in the latest UK Climate Projections (UKCP).
- Given the level of confidence that can at present be had in regional climate projections over the next few decades, the best adaptive response can often be to build in more resilience. We also suggest that plans for adapting the UK to climate change should remain as flexible as possible for some time to come.
- Uncertainties in climate projections are compounded by uncertainty about the specific responses of biogeochemical cycles, species and ecosystems to climatic stress and novel climatic conditions and the impact of feedbacks between the different components of the entire system.
- The interaction of climate change with habitat loss and agricultural intensification will be crucial for the persistence of species and ecosystems. UK management should facilitate key habitats and ecosystems to remain both interconnected and diverse.
- Some issues cannot be managed effectively at a regional or even national scale and a European-scale response will be required. Government machinery and incentives will need to be structured carefully to avoid sub-optimal fragmented responses, either geographically or sectorally.
- The big challenge for climate science is to provide useful predictions of regional climate change statistics for the next few decades. Far-sighted research that explores the complex interactions between climate, society and ecosystems and their implications for adaptation is also required.

CLIMATE PROJECTIONS

1. There is a dangerous perception in the impacts and policy communities that the climate projection problem is essentially solved and that downscaling from current global climate models provides a firm basis for determining impacts and adaptation requirements at a regional level.

2. In reality, there is a cascade of confidence in climate projections. There is indeed very high confidence in the occurrence of climate change due to human emissions of greenhouse gases and the associated nature of planetary scale trends in temperature. There is some confidence in trends for precipitation on the same scale. There is moderate confidence in aspects of continental scale climate change projections.

3. There can at present be little confidence in projections for UK regions on decadal time-scales, however. This uncertainty stems from the current inability of climate models to represent well the statistics of the weather regimes that affect the UK, such as European blocking phenomena. There is much research into the understanding, techniques and measurements that will enable climate models to forecast the behaviour of slow, decadal time-scale modes of variability in the climate system, for example the Atlantic Multi-decadal Oscillation. However, the climate model projections which provide the current basis for the determination of impacts and the requirements for adaptation for the next few decades do not contain good representations of the climate variability on those time-scales.

4. These failings cannot be compensated by any downscaling or statistical procedures, however complex, and will be reflected in uncertainties on all scales. So for the UK, there is currently little confidence in likely changes in the frequency of extreme precipitation events or persistence of droughts.

ADAPTATION AND MITIGATION: BOTH ARE NEEDED

5. Global climate models, as assessed by IPCC, suggest little dependence of climate change on the actual emission scenario until after 2030. In other words, mitigation action cannot now significantly affect near term climate change impacts due to the inertia in the climate system. Further climate change is therefore inevitable and adaptation to it is essential.

6. Moving adaptation higher on the agenda is therefore a necessity but must not deflect from the priority for mitigation. Under current circumstances both are needed in order to cope with inevitable change to come but also to limit the extent of further change that may be beyond the capacity of human and natural systems to adapt without major dislocations to society, the economy and the environment. The local adaptation to climate change must be considered in the context of the global requirement to mitigate the change.

7. Adaptation capacity will be constrained by a variety of factors including: the inherent characteristics of the systems under consideration; linkages and interdependencies across spatial scales and systems; uncertainties in future climate and in system responses to those climate changes; political and institutional hierarchies; and by resource availability.

8. There can also be mal-adaptation: hotter buildings in summer must be countered through better design rather than more air conditioners, at least until electricity supplies have been decarbonised. Adaptation strategies in agricultural systems need to consider greenhouse gas fluxes as well as the maintenance of production.

THE ADAPTATION/MITIGATION MIX

9. Mitigation action is by its nature global. One key determinant of anthropogenic climate change is the cumulative level of global emissions of carbon dioxide into the atmosphere, not the annual or even cumulative emissions of a single country. The contributions to climate change of other, often shorter-lived but more powerful greenhouse gases as well as that of aerosols are also important. Indeed, agricultural emissions of methane and nitrous oxide may prove to be a long-term constraint on how much we can reduce greenhouse gas emissions.

10. By contrast, adaptation is to a far greater degree influenced by local or national level decisions and actions. The bulk of adaptation costs and benefits are likely to fall on the same generation and within a defined geographical region, rather than globally. There are, however, important examples of externalities in adaptation—both potentially positive and negative. For example, the result of a particular approach to minimizing flood risk or enhancing coastal defense in one area may be simply to shift the risk elsewhere.

11. The time dimension of mitigation and adaptation actions must be considered carefully. Mitigation and adaptation are likely to differ in terms of the timing of their costs and the flow of their benefits, both of which remain subject to considerable uncertainties. Given this, we need to pursue both mitigation and adaptation policies, aiming iteratively to determine an appropriate mix of mitigation and adaptation over time, informed by new information about rates of climate change and impact and from current and future research programmes.

12. Water resources are an important example of where adaptation and mitigation need to be considered together. The water industry is a major user of energy in the UK. This energy use is expected to increase due to climate change, for example due to energy intensive drought adaptation measures such as desalination, long distance pumped transfers, and potentially increased treatment costs associated with increased chemical/biological pollution.

13. Both mitigation and adaptation efforts can have perverse outcomes and need to be carefully and broadly assessed for costs, benefits and risks. For example, certain low-carbon energy technologies result in incursions into intact natural habitats leading to further deforestation, degradation and associated emissions. Transport infrastructure designed to serve such installations can disrupt ecosystems, release green carbon, reduce resilience and disrupt the natural processes that enable species to adapt to and persist in the face of change. Large-scale land use change, associated with managing flood risk and water quality, also may have implications for climate feedbacks, for example release of carbon from drained peatlands.

CLIMATE INFORMATION FOR ADAPTATION DECISIONS

14. The quality of information available for adaptation decisions in the UK is not currently high, despite the progress made in the latest UK Climate Projections (UKCP). The team that reviewed the methodology underpinning these projections for the Government was Chaired by the Director of the Grantham Institute. It concluded that the scope of the UKCP commission stretched the ability of current climate science and methodology.

15. The 25km scale climate change information provided by UKCP is indicative to the extent that it reflects the large-scale changes modified by local conditions. There is no climate change information in the 5km data provided by UKCP beyond that at 25km. All that can be produced is a range of examples of local climates consistent with current larger-scale model projections. The confidence in the climate change information also depends strongly on the variable under discussion. For example, for UKCP no projections are given for regional or local wind changes.

16. Given the level of confidence that can at present be had in regional projections over the next few decades, the best adaptive response can often be to build in more resilience. We also suggest that plans for adapting the UK to climate change should remain as flexible as possible for some time to come.

RELATIONSHIP BETWEEN CLIMATE AND OTHER TYPES OF ENVIRONMENTAL CHANGE

17. Climate change generally impacts on the natural environment in consort with other pressures on it. A wide-ranging, holistic approach is therefore required to adaptation which may currently be lacking. For example, current UK strategic flood risk planning almost completely neglects environmental change except for direct impacts of climate change (ie increased rainfall intensity).

18. Uncertainties in climate projections are compounded by uncertainty about the specific responses of biogeochemical cycles, species and ecosystems to climatic stress and novel climatic conditions and the impact of feedbacks between the different components of the entire system. This raises questions about the extent to which species and ecosystems are able to adapt without anthropogenic assistance. A report to the LWEC board by Grantham-associated researchers highlighted the weak evidence base in the scientific literature concerning the potential for UK species and ecological communities to adapt or disperse following environmental change.⁶⁰ Current planning risks running ahead of knowledge that presumed mechanisms can work.

LAND MANAGEMENT

19. Agricultural land management is central to climate change adaptation. For example, current activity in the water industry is looking into manipulating land use to improve river water quality and ecology, to reduce flood water generation and to increase flood water storage. The potential gains to be made, in terms of balancing human needs and environmental needs under pressures of climate change, are clearly large.

20. However, climate change introduces complexity which has not yet been tackled adequately: research has focused on direct effects of climate change (ie changes in river flows due to rainfall and temperature changes). Less direct effects, such as impacts of the hydrological cycle due to vegetation and soil structure, are potentially crucial, but have not yet been studied.

21. Much UK and European planning for land use (including for biodiversity conservation, water management and agriculture) is based on 1970s climates. Under realistic regional climate change projections these plans may range between sub-optimal to unrealistic. To meet economic and social goals, land use planning may need to be undertaken at larger spatial scales.

22. Within the UK, the strategy for adapting to climate change must fit within the wider policy of the EU and encompass initiatives to mitigate the impacts across nations, rather than focus solely on UK issues. Regional and local governments will need to take action at the smallest scale to enact the policy decisions being determined at the national and international level.

WATER RESOURCES

23. Overall, the future balance of water supply and environmental needs for water is complex, depending on interacting social, political, economic and technological factors as well as climate change. Relevant factors in the water industry include: social acceptability of non-potable water supply; social acceptability of water recycling; social attitudes towards cheap water supply versus environmental protection; effects of water metering and other demand management measures; cost of energy; trends in water pollution and associated treatment costs; population growth and distribution; desalination technology (at present high energy cost, although there is potential for use of renewable sources).

24. The complexity of the problem requires future scenarios to be developed which account for the interactions. This has already been done for flood risk to some degree (Foresight), but not for water resource and environmental planning. In the UK, there is wide scope for environmental damage and increased carbon footprint due to water supply adaptation options. In particular, ecosystems are sensitive to water availability (water levels in rivers, lakes and wetlands, and soil moisture) and rely on the natural variability of the hydrological cycle. There are abundant examples in the UK of degraded ecosystems due to over-abstraction of water (and also due to flood protection).

25. However, the UK as a whole, under current climate, has surplus freshwater; furthermore, nationally we remain one of the least efficient water users in the developed world. We believe there is significant scope to improve the UK freshwater environment, and adapt to and mitigate climate change simultaneously. However, doing so with current knowledge is not possible—investment in research should be the current priority.

⁶⁰ Mace, G M, Chevin, L-M, Roberts, M and Coulson T (2009) *The biological limits to adaptation: What is known and not known about genetic and phenotypic responses to rapid and extreme environmental change* Contract no R8/H12/109—Living with Environmental Change pilot review scheme—Objective B Scoping Study.

RESILIENCE OF THE FRESHWATER ENVIRONMENT TO CLIMATE CHANGE

26. In general, natural surface water systems in the UK provide habitats (shelter, pathways, water storage, and nutrient supply) and have good ecosystem value. However, ecosystems will change in response to significant climate change, and although this is expected to be gradual, effects on ecosystem value are uncertain. Some UK freshwater bodies have been significantly degraded by human intervention (channel straightening, cattle poaching of banks, pollution sources, etc) and recovery of these systems remains a priority irrespective of climate change. In some cases, there is large scope for engineered resilience to climate change, for example by simulating natural flow regimes and augmenting low flows by reservoir releases.

27. There is currently little research on how society values the natural freshwater environment versus quality and cheapness of water supply and other human uses. However, EU directives on environmental protection—notably the Water Framework Directive (WFD) and all the daughter Directives which it covers—imply that environmental protection will be a primary objective of climate change adaptation. Although the WFD is clear on the fact that good ecological status should be aimed for in general, what constitutes ‘good’ is not clear.

28. The freshwater environment should be allowed to adapt naturally to climate change, as far as possible given the human needs for water. This does not mean “do nothing”; rather it means minimizing effects of direct human influences to allow more natural conditions (eg abstraction management, development control), or in some cases controlling direct human influences to simulate natural conditions (reservoir releases to simulate natural flow regime; wetland creation as part of flood management).

ECOSYSTEMS AND BIODIVERSITY

29. The interaction of climate change with habitat loss and agricultural intensification will be crucial for the persistence of species and ecosystems. In previous episodes of climate change in the Earth’s history, species and ecosystems largely responded through shifts in altitude and/or latitude or through persisting in small refugial areas. In the modern UK, where landscapes are dominated by anthropogenic land uses, these options are no longer available. Even species that are able to disperse across modified landscapes are not guaranteed to persist under new climatic conditions where there is no habitat for them to disperse to or where other biotic interactions or phenological cues are disrupted. In general, barriers to movement and dispersal will severely compromise natural adaptive responses.

30. Land management will also play a crucial role in the persistence of biodiversity under climate change. Patterns of land use determine the isolation of natural ecosystems and greatly influence the ability of species to disperse from one habitat to another, a process that will be needed if climate change results in the movement of species’ climatic niches. Designing landscapes to maximize connectivity should be an important component of climate adaptation measures.

31. Climate change is an issue that is much wider than the UK alone and for some issues a European-scale response will be required. For example, species currently within the UK may no longer be able to survive here, but may be able to survive in areas of Europe where they were never historically present. Similarly, some European species may be forced from their historic ranges, but find a new home in the UK. We are likely to see dramatic increases in invasive species and pathogens, many or most of these will be deleterious to UK native species and habitats. But some potential exists for recovery or the establishment of new biodiversity which could be advantageous overall. It is therefore important not to see change as always an undesirable outcome.

32. To date, conservation policies have prioritized limiting spread of species into and out of the UK, in part to limit the spread of pests and diseases but also to maintain the integrity of the UK fauna and flora. Such policies will require careful re-examination under climate change where persistence in situ may be unlikely and needs will be better served by allowing or managing dispersal within and across national boundaries.

33. Such cross-border effects of climate change cannot be effectively managed at the national scale. Cross-European collaboration presents opportunities for planning and implementation at a much broader scale which can be extremely beneficial. However, effective adaptation at the European scale will involve compromises at the national scale and this needs to be discussed and understood within and among all EU states before such an approach is adopted and implemented.

34. There is also potential that interactions and feedbacks will occur among different systems. For example, alterations to the freshwater systems may have strong impacts on terrestrial protected area systems by increasing the frequency of floods and/or droughts, and through long-term changes to water table levels.

35. In order to maintain ecosystem functions in an uncertain future, we should ensure that ecosystems are as resilient as possible. Those systems that are restricted, homogeneous and isolated are likely to be less resilient. It follows that UK management should facilitate key habitats and ecosystems to remain both interconnected and diverse.

MACHINERY OF GOVERNMENT

36. Based on the above, there is a clear risk of sub-optimal adaptation responses for a number of reasons. One risk is that Government places too much confidence in particular climate projections and planning runs ahead of our knowledge of both the future climate and the response of other key systems to climate change. This might lock in inappropriate adaptation strategies and increase climate costs. Another risk might be that the way in which UK Government is structured and in which resources are allocated might act as a disincentive to synergistic action across regions and/or sectors. Consideration therefore needs to be given to how the Government can increase the incentives for the relevant Departments and agencies to work more effectively together to address the adaptation challenges we face, both at a UK and at an EU scale.

RESEARCH CHALLENGES

37. The big challenge for climate science in the next decade is to provide useful predictions of regional climate change statistics for the next few decades so as to provide a basis for more advanced adaptation strategies.

38. Far-sighted research is needed which explores the complex interactions between climate, society and ecosystems and their implications for adaptation. The ability to predict where, when and how often ecological or other thresholds (eg flood risk) will be passed under climate change is beyond our current knowledge and the present generation of scientific models.

26 October 2009

Memorandum submitted by the Met Office

SUMMARY

— *Adapting to climate change presents new and complex challenges for science*

Detailed projections at a local level present significant challenges to today's science—yet deepening understanding of regional and local changes in weather patterns is fundamental to ensuring appropriate, targeted and cost-effective adaptation strategies are developed.

— *Costly adaptation decisions must be based on robust scientific evidence*

Major investment decisions should be informed by better regional climate information. Science advice should be provided based on the best understanding we have now but adaptation strategies and planning must remain flexible enough to respond to new research and developing technologies that enable the delivery of breakthrough science and increased capabilities.

— *Climate change risk assessment is effectively based on a weather sensitivity analysis*

When weather sensitivities and particular vulnerabilities are fully and expertly understood, and taken alongside the most robust forecasts for change, adaptation plans can be most cost-effective.

— *Weather forecast services can be an important and cost effective method of responding to climate change*

Flood prevention, for example, has significant costs attached but we are already seeing, through the creation of the Flood Forecasting Centre, how warnings can make a positive contribution to an appropriate flood risk management strategy. Warnings will also be vital in future heatwaves if we are to avoid a repetition of 2003, which saw in excess of 30,000 lives lost across Europe.

— *Developments in capability will make increasingly important contributions*

As capability continues to develop, seasonal and decadal forecasts will increasingly contribute to planning by informing adaptation timescales—especially where natural climate variability overlays the long-term change in climate.

— *National capability could be better exploited*

The Met Office is a valuable national capability that could be better exploited across Government in a fully integrated climate research programme.

Adapting to climate change presents new and complex challenges for science

1. Although there is a general consensus on the broad features of expected climate change, there are still uncertainties, particularly when considering how the climate may change locally. This, taken with the fact that historical climatologies will not describe the future, means adaptation presents new and complex problems for science to address.

2. The focus of climate science, and therefore its development, has until recently been on mitigation. However, it is now globally accepted that previous and current levels of anthropogenic emissions will make some amount of climate change unavoidable—regardless of future mitigation activities. Strong mitigation,

like that described in the UK Climate Change Act, will reduce future climate change but it will not eliminate it. Consistent mitigation and adaptation advice therefore are needed in the UK and globally to underpin sound and ongoing decision-making.

3. The inability to use the past to judge the probability of future severe weather events is especially significant given that we are already seeing strong signs for increased frequency and/or intensity of some types of severe weather: the number and intensity of extreme winter rainfall events will increase; summer showers are likely to be heavier; and the risk of heatwaves such as the one experienced over Europe in 2003 has doubled—with these likely to be commonplace by the 2040s.

4. Deepening understanding of the impacts of a changing global climate on severe events and regional and local weather patterns is fundamental in ensuring appropriate, targeted and cost-effective adaptation strategies are developed. However, detailed projections at this local level present significant challenges to today's science—current global models have a grid spacing of 150km (due to increase to 90km with the next generation of models) and so there are severe limitations on providing detailed local advice suitable for planning.

Costly adaptation decisions must be based on robust scientific evidence

5. Although uncertainties exist, the strengths and weaknesses of the body of evidence on climate change are well understood by the Met Office. This depth of understanding is vital if the UK is to avoid being paralysed under the weight of what can appear to competing messages.

6. Similarly, failure to recognise climate projections as containing uncertainties can be just as detrimental. The reality in many areas is that decisions need to be based on a balance of probabilities. Some conclusions are likely to be very well founded and others less certain. Strategy and policy needs to be developed in full recognition of the associated uncertainties and, if required, to accommodate them directly.

7. Likewise, science advice should be provided based on the best understanding we have now but adaptation strategies and planning must remain flexible enough to respond to new research and developing technologies that enable the delivery of breakthrough science and increased capabilities.

8. Much of the investment that will be required for adaptation is extremely expensive. With respect to infrastructure in particular (where much of the activity will be required in response to changing local, extreme events), it is vital that costly adaptation decisions are based on robust scientific evidence: to minimise costs, as well as risks to infrastructure and life. For example, flood defence costs for the UK run to several hundred million pounds per year, and are likely to rise.

Climate change risk assessment is effectively based on a weather sensitivity analysis

9. If climate can best be described as the typical weather conditions experienced over a long period in a given area, then adapting to a changing climate is best thought of as adapting to changes in local, regional and global weather patterns. Climate change risk assessment is therefore, in effect, an analysis of weather sensitivity. It is only when these sensitivities and particular vulnerabilities are fully and expertly understood, and taken alongside the most robust forecasts for change, that adaptation plans can be most cost-effective.

10. In addition to human-driven climate change, the climate varies naturally and so adaptation strategies must accommodate both unavoidable climate change and natural climate variability. This requires a deeper understanding of sensitivities to climate change and variability, and an improved ability to forecast climate change and climate variability and their impacts. It is the combination of climate prediction and weather forecasting capability that will ensure a coherent response to the challenges presented by climate change.

Weather forecast services can be an important and cost-effective method of responding to climate change

11. Weather forecasting and warning services will provide an increasingly important element of adaptation strategies—particularly where other responses prove inappropriate or too costly.

12. Flood prevention, as mentioned earlier, has significant costs attached but we are already seeing, through the creation of the Flood Forecasting Centre, how warnings can make a positive contribution to an appropriate flood risk management strategy. Warnings will also be vital in future heatwaves if we are to avoid a repetition of 2003 which saw in excess of 30,000 lives lost across Europe.

13. As capability continues to develop, seasonal and decadal forecasts will increasingly contribute to planning by informing adaptation timescales—especially where natural climate variability overlays the long-term change in climate.

14. A major impact of a changing global climate is already being seen in food production, where changing weather patterns will force changes in agricultural practices; knowing how the climate in the UK will change locally—and on what timescale—is vital to ensure our own agricultural well-being.

15. Although the UK has its own domestic challenges, not least in changing incidents of severe weather and protecting our critical national infrastructure, it also has a significant interest in international development. Water, food and energy are resources already challenged in many parts of the world—but science expertise is concentrated in developed countries.

16. Strategic forward planning and assessment of areas of current and future vulnerability are vital to ensuring developing countries are best equipped to adapt to changing weather patterns. Realistic projections of future climate change and its impacts on a regional scale can play a role in long-term planning. Forecasting climate variations on decadal and seasonal timescales will help inform adaptation options and priorities.

Developments in capability will make increasingly important contributions

17. Developing capability in forecasting on all timescales is vital if every option in responding to the challenges and opportunities presented by a changing climate is to be exploited to its fullest.

18. Operational weather forecasting and warning services have obvious and immediate uses and benefits but, with climate extremes expected to become more frequent under future climate change, seasonal forecasts will become increasingly important as early warning tools for public and national infrastructure. The Met Office is pushing the boundaries of science in this field and we have already shown they are able to provide valuable advice on both a domestic and international front: seasonal forecasts are currently used to great effect in areas such as forecasting North Sea winter wave heights and forecasting the wet season in Africa.

19. A second breakthrough in capability comes with decadal forecasting which is being developed by incorporating initial environmental conditions into climate models. These forecasts are specifically aimed at providing better guidance on short-term climate variations on a regional scale, making them an ideal tool in risk-based decision-making where probability of a likely outcome is required.

20. One of the most important and well-known examples of natural variability is the El Niño Southern Oscillation. El Niño affects sea surface temperatures in the tropical Pacific, causing them to swing from relatively warm to relatively cool every few years, with consequential changes to weather patterns around the world. Encouragingly, the Met Office's decadal forecasting system predicts El Niño for the first 15–18 months with more skill than climate models which do not incorporate initial conditions.

21. Long-term climate projections are also increasingly possible and will prove invaluable in planning and prioritising funding—50-year projections, for example, are vital when making decisions about large-scale infrastructure upgrades and/or replacements, such as the Thames Barrier.

National capability could be better exploited

22. The Met Office employs around 400 of the world's leading experts in climate science and undertakes and facilitates significant research in the field. Importantly, and uniquely, it is also able to integrate breakthrough developments in science into fully operational climate and weather forecasting services, quickly and with a true end-user focus. This makes us ideally placed to lead coordination with research councils to ensure a sensible programme of pull-through to operational services.

23. This national capability could be even better exploited across Government. A fully integrated climate research programme would ensure all parties are able to use and respond to the same information base. Common issues would become apparent thereby ensuring research was better targeted—with the risk of multiple funding of core research eliminated. This pay once, use many times approach would allow Departments to fund directly only those services specifically required for their policy area.

2 November 2009

Memorandum submitted by South West Climate Change Impacts Partnership (SWCCIP)

The South West Climate Change Impacts Partnership (SWCCIP) is the South West Region's only partnership focused on the impacts of climate change and what we need to do to adapt. SWCCIP's activity is focused across seven priority sectors: Agriculture & Forestry, Biodiversity, Business & Utilities, Housing & Construction, Local Government, Tourism, and Transport.

The Partnership's mission is: To help the South West Region of England to adapt sustainably to the impacts of climate change by:

- communicating and responding to the science of climate change;
- advising on the social, environmental and economic impacts of climate change;
- delivering and promoting sustainable adaptation responses; and
- engaging with stakeholders in the South West, and other regions, to deliver on climate change adaptation.

SWCCIP is funded by the Ecclesiastical Insurance Group, the Environment Agency, Defra and South West Water. SWCCIP's Tourism Sector Group also receives direct funding support from South West Tourism.

This is SWCCIP's response to questions it was posed to inform the Environment Audit Committee's Inquiry. Those comments in italics are additional supporting comments provided by Climate East.

1. WHAT IS WORKING WELL ON THE GOVERNMENT'S ADAPTATION PROGRAMME, WITH THE RESOURCES GIVEN?

From a SWCCIP perspective the following parts of the Government's Adaptation Programme are working well:

- The provision of Defra funding to the English Regional Climate Change Partnerships (RCCPs). The security of funding between 2009-2011 has enabled SWCCIP to recruit a full time SWCCIP Project Officer (to support the Manager), which has significantly increased SWCCIP's capacity to deliver.
- The ongoing resource to support UKCIP, who provide each of the RCCPs with a great deal of technical support, information and advice.
- Defra (and UKCIP's) delivery of the regional Projections in Practice (PiP) events. These were very positively received in all the regions; in the South West alone 330 delegates attended 9 sessions organised by SWCCIP and facilitated by UKCIP. The UKCIP09 tools are very detailed, but invaluable in helping organisations understand the likely impacts of climate change on our region and the importance of the need for adaptation. So training events like PiP are needed to help continue to get the key messages out to a wider audience regionally and locally. (*Climate East also found the PiP weeks valuable. They find the tools very powerful in telling the messages about climate change and believe that the events were valuable to allow them to spread the word.*)
- The duty for local authorities to report on adaptation through National Indicator 188 (NI188): planning to adapt to climate change has been a key driver for adaptation activity at a local authority level. Although some local authorities in the South West were already taking adaptation action, since the introduction of NI188 more local authorities in the region have started to take action to embed adaptation into their work. As a result 9 of the 16 South West's upper tier local authorities designated NI188 and committed to reaching NI188 Level 3 by 2011.

2. WHAT ARE THE REMAINING BARRIERS TO ADAPTATION, AND WHAT WOULD HELP TACKLE THESE BARRIERS?

- While SWCCIP welcome the additional funding recently provided by Defra for the RCCPs, it is important to note that funding from various sources such as the Regional Development Agency, Government Office and local authorities has either been cut or is insecure across many of the RCCPs, including SWCCIP. All the RCCPs have a valuable role to play in raising awareness of the impacts of climate change and more importantly developing and delivering regional adaptation action. It is important that funding for all the Regional Climate Change Partnerships is secured for a longer period of time, ensuring the future of these partnerships, and enabling them to build capacity at a regional and sub-regional level.

From SWCCIP's work with our priority sector groups a couple of other barriers to adaptation present themselves:

- Firstly, through work with our with businesses and our Tourism Sector Group, many businesses (particularly SMEs) believe that the impacts of climate change will not affect them/that the impacts are not immediate or already happening. A SWCCIP Tourism Sector Group survey of tourism businesses in the South West (2008) highlighted that out of c.270 respondents 43% didn't think that climate change is affecting or is likely to affect their tourism business. The new UKCIP09 projections will help to highlight more clearly the likelihood of different impacts over different periods of time. But we should also communicate how events like the 2007 Gloucestershire floods (while not directly attributable to climate change) highlight our current vulnerability to extreme weather events, events that we are already starting to experience. SWCCIP believe that there is still much work to be done to get across that climate change is already happening and what it means to businesses and organisations. But these messages must focus on both the challenges and opportunities presented by climate change, to show that action taken now can help improve the resilience of businesses and organisations. To help this process it is key that Defra communicates to national and regional organisations, trade bodies/associations etc the importance of adaptation and the need to take action.
- Secondly, while there are organisations, bodies, businesses who understand that climate change is an issue, they may not have the knowledge, skills or resource to know what action to take. Equally they may not know what adaptation "looks like". Therefore more work is needed to promote examples of adaptation action at all scales (nationally, regionally and locally) to ensure that adaptation actions can be considered, planned for and undertaken now.
- SWCCIP's Tourism Sector Group recently contacted the Association of British Insurers (ABI) to see whether incentives could be offered to those businesses who proactively take adaptation actions eg through reduced insurance premiums. This currently doesn't appear to take place. However, we would be keen to see the insurance industry (and possible other bodies that have influence over businesses ie banks) offer more tangible incentives/benefits for those actively taking adaptation

actions. We believe this not only benefits those who are already taking adaptation action, but also helps to incentivise more businesses and organisations to consider adaptation more fully in their business planning/activities.

- While the SWCCIP PiP week was a useful and welcome introduction to UKCP09 for a wide range of regional partners, there is still a need for ongoing support on the use and how to communicate the messages of UKCP09. The tools are very useful in enabling us to show the range of impacts and likelihood of impacts at a variety of scales, but they remain quite complex. While SWCCIP are working with UKCIP to produce some headline messages from UKCP09 for our region, SWCCIP alone doesn't have the resource to help all organisations in the region to know how to use and communicate the vast range of information contained in the projections. Therefore further work is needed to help communicate UKCP09 to a range of audiences at a range of scales; nationally, regionally and locally. (*Climate East also highlighted that barriers exist around the infiltration of UKCP09 material into existing projects and programmes. More resource would allow them to approach more people. Adaptation is an issue that each individual and organisation must take responsibility for depending on their circumstances but some common guidance on principles based on UKCP09 would be beneficial.*)

3. HOW HAVE THE REGIONAL CLIMATE CHANGE PARTNERSHIPS RAISED AWARENESS OR ENGAGED WITH THE PRIVATE SECTOR ON ADAPTATION? FROM YOUR WORK, HOW DO THE PRIVATE SECTOR SEE THEIR ENGAGEMENT ON ADAPTATION AT THE LOCAL, REGIONAL, NATIONAL LEVELS?

- SWCCIP has previously tried to engage with businesses directly on climate change adaptation. For example, we worked with Arup to hold nine workshops on climate change adaptation in March 2009 for those sectors in the region most at risk from the impacts of climate change: Agriculture, Food & Drink, Construction, and Tourism. While the workshops were helpful to those who attended, actual levels of attendance were much lower than anticipated. SWCCIP has therefore decided to try and engage more effectively with businesses by working in partnership with those organisations who already provide support to businesses.
- SWCCIP's Business & Utilities Sector Group was established in February 2009. The aim of the group is: "To engage South West businesses, via existing business support networks, in addressing their vulnerability to the effects of climate change and maximising the opportunities that arise". This group is chaired by Business Link SW and has membership from a range of organisations and businesses support organisations including Global Action Plan, South West Water, Michelmores LLP to Business in the Community, Federation for Small Business and SW Regional Development Agency.
- Although only recently established the Business & Utilities Sector Group are currently exploring working with a student at a local university to complete a study to help gather a baseline understanding of current levels of vulnerability to the impacts of climate change amongst businesses in the South West. By focusing on the types of businesses (in terms of size, sector and location type) which are particularly vulnerable (or resilient) and the nature of that vulnerability, we hope to help the sector group and its members to know where and how to prioritise its resources on working with businesses on climate change adaptation.
- In addition, work with SWCCIP's Tourism Sector Group has led to the development of a DVD 'Changing Climate: Changing Business' which features 11 tourism business case studies, and aims to help raise business awareness of the need to adapt and to demonstrate the practical actions that can be taken. This is available to view via: <http://www.swtourism.org.uk/our-strategic-work/sustainability-work/adapting-to-a-changing-climate/>
- Our experience suggests that regional private sector engagement on climate change adaptation is limited. In part because it is not seen as a priority; in the current economic climate there are too many other competing pressures for time and resources. Additionally, in the South West we have a very high proportion of small and medium sized enterprises many of whom do not see climate change (adaptation) as a current risk/an issue relevant to them. To address this, SWCCIP is starting to work through Climate UK⁶¹ to develop a glossary of terms with which to engage businesses on climate change adaptation by linking it to existing business issues and language like business continuity, risk management etc.
- (*Climate East are in the infancy of their adaptation approach to business, although they have support from Business Link and others. They suggest that more UKCP09 training events for specific groups would be helpful. They are using DEFRA funding to take forward a business Local Climate Impacts Profile (LCLIP) study in the region. They experience good levels of engagement across different SME sectors and a good interest levels from engaged parties.*)

⁶¹ Climate UK is a group representing the climate change partnerships in the nine Regions of England and in Wales, Scotland and Northern Ireland, along with the Environment Agency and UKCIP. The group exists to help move the UK towards effective regional-scale adaptation to climate risks by sharing information and good practice, collaborating on issues of common interest and representing the partnerships to outside bodies.)

4. ARE THERE EXAMPLES OF GOOD OR SUCCESSFUL ADAPTATION ACTIONS. IN PARTICULAR ARE THERE EXAMPLES WHERE WE CAN DEMONSTRATE THE LESSONS LEARNT OR KEY SUCCESSES TO DATE FROM PARTICULAR ACTION?

- SWCCIP has a range of case studies highlighting where adaptation action has occurred across a range of sectors. These are detailed on our website: <http://www.oursouthwest.com/climate/casestudies.htm> This is a growing resource, as there is an increasing demand for case studies highlighting action on adaptation. However, we recognise that many of these are small-scale examples of adaptation, so it is more difficult to demonstrate the key successes or lessons learnt.
- In June 2009 a local authority case study guide *Adapting to Climate Change: local areas' action* was produced by CAG for the LRAP Board. SWCCIP was on the steering group for project, which collated 27 national case studies, including three from the South West, highlighting what actions local authorities have taken in relation to climate change adaptation. This guide seeks to identify those processes and actions that have worked and could be replicable by other local authorities. Accessible via: http://www.cagconsultants.net/resources/climate-change-case-study/Adapting_to_Climate_Change_Local_Areas_Action_June09.pdf
- Finally SWCCIP has recently been successful in bids to the South West Regional Improvement and Efficiency Programme (SWRIEP) to fund two projects:
 - The first is the delivery of a regionally coordinated Local Climate Impacts Profile (LCLIP) project involving 11 South West local authorities over a 3 month period. The aim of this project is to help those local authorities gain a better understanding of the consequences of recent past weather events and feed in to their work on NI188; as well as identify and common issues and impacts across the region.
 - The second project has resulted in the recent appointment of a South West NI188 co-ordinator. The purpose of this post is to be able to provide local authorities with some dedicated one-to-one support to help them progress against NI188.
 - Although both these projects are just starting, they will result in the development of cases studies from which we can start to clearly identify and demonstrate the lessons learnt/key successes from particular action taken. The LCLIP project is expected to be completed in Spring 2010 and NI188 coordinator will be in post until March 2011.

22 November 2009

Memorandum submitted by the Department of Energy and Climate Change (DECC)

BACKGROUND TO THE DRAFT NUCLEAR NATIONAL POLICY STATEMENT (NPS) AND ASSOCIATED RELEVANT DOCUMENTS

The draft Nuclear NPS, taken together with the “*Overarching National Policy Statement for Energy: A Framework Document for Planning Decisions on Nationally Significant Energy Infrastructure*” (EN-1), provides the primary basis for decisions taken by the Infrastructure Planning Commission (IPC) on applications it receives for the energy infrastructure.

This draft NPS also lists 10 sites that the Government has judged to be potentially suitable for the deployment of new nuclear power stations by the end of 2025. The list of sites in the draft Nuclear NPS is the output from the Government’s Strategic Siting Assessment (SSA) process. Sites have been assessed against flood risk and coastal erosion including the potential impacts of climate change.

The Government has also conducted an Appraisal of Sustainability on the draft Nuclear NPS. The role of the Appraisal of Sustainability is to help to ensure that the draft Nuclear NPS takes account of environmental, social and economic considerations, with the objective of contributing to the achievement of sustainable development. It has been undertaken in such a way that incorporates the requirements of the Strategic Environmental Assessment Directive. This includes a consideration of flood risk. There are Appraisal of Sustainability Reports covering the draft Nuclear NPS in general, as well as Appraisal of Sustainability reports on each of the sites.

REGULATORS—ROLE IN EXISTING AND NEW SITES

As with other major energy infrastructure the regulators play an important role in ensuring the safety, security and protection of people and the environment in relation to the design, construction, operation and decommissioning of nuclear power stations and the transport of nuclear material. Annex C of the White Paper on Nuclear Power summarises the primary responsibilities of those organisations involved in the regulation of nuclear power generating stations.⁶²

⁶² *Meeting the Energy Challenge: A White Paper on Nuclear Power*, January 2008, CM 7296, URN 08/525, Annex C, p 181.

The UK has two primary regulators for nuclear power stations:

- The Health and Safety Executive (HSE) who regulate the safety and security of UK nuclear power through their Nuclear Installations Inspectorate (NII), who are responsible for all safety issues; and through the Office of Civil Nuclear Security (OCNS), who cover both physical security and security of information and IT systems. The NII examines the safety justifications against all external hazards including those in relation to flood risk and climate change. As part of the site licensing process for new nuclear build, these aspects will be considered. For existing sites, the safety cases for external hazards are reviewed through the periodic safety reviews, which are undertaken by the site licensees as a requirement of their site licence. Appropriate levels of engagement with the Environment Agency are made during these assessments. The NII outlines its position in its Safety Assessment Principles for Nuclear Facilities, p38, reference: <http://www.hse.gov.uk/nuclear/saps/saps2006.pdf>. Further, more detailed guidance is contained within the NII technical assessment guide for External Hazards <http://www.hse.gov.uk/nuclear/tagrevision.htm>
- The Environment Agency who are responsible for regulating the impact of nuclear installations in England and Wales on the environment.⁶³ In this they cover nuclear specific issues such as radioactive waste disposal (including discharges to air and water) together with non-nuclear matters such as, water abstraction, flood management and conventional waste. In relation to flood and coastal risk management and climate change the Environment Agency, as a statutory consultee for planning application, is responsible for strategic overview, Its consenting authority role includes:
 - works in, over or under main rivers, or likely to affect the integrity of tidal defences;
 - raising ground levels in the floodplain beside a main river; and
 - coastal works that fall outside of the scope of those consented by local authorities.

The nuclear licensing regime enforced by the NII requires that new nuclear power stations are located, constructed, operated and decommissioned with the long-term impacts of climate change in mind. The NII requires existing and new site licensees to ensure their sites are safe against sea-level rise and storm surge throughout the life of the nuclear power stations, including during decommissioning. This includes sites that are being decommissioned and are managed by the Nuclear Decommissioning Authority (NDA).

PERIODIC REVIEW

Both existing nuclear licensed sites, those sites which are being managed by the NDA and new nuclear licensed sites are subject to periodic review by the regulators and through this their capacity to withstand potential climate change will remain under consideration throughout the life of the nuclear power station.

Once licensed, as part of the site licensing conditions, the licensee must review their safety case at regular intervals (typically on a 10-year basis). This review will take the most recent climate change projections into account and allow the necessary modifications to flood defences and/or operating arrangements to be undertaken. The objective of the review is to compare the safety case of the site against modern standards to see if there are reasonably practicable improvements that could be made, to demonstrate that the plant is safe to continue to operate, including spent fuel and radioactive waste storage for the next defined period (typically 10 years) and to identify any life-limiting factors. Failure to comply with any of the site licensing conditions (including participation in the periodic review) could ultimately result in a direction to undertake activities that would bring the plant into a compliant position.

POTENTIAL IMPACTS OF CLIMATE CHANGE AND NEW SITES LISTED IN THE NPS

Climate change is likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is a likelihood of increased flooding, drought, heatwaves, intense rainfall events and other extreme events such as storms, as well as rising sea levels.

The Appraisal of Sustainability states that the relationship between the draft Nuclear NPS and flood risk is essentially local or possibly sub-regional where a number of potentially suitable sites are in proximity to each other. It also has a number of different effects. The first of these is the local impact that the individual development may have on the risk of flooding to land adjacent to those sites. Secondly the sites themselves may be vulnerable to the risk of flooding from a number of causes, coastal, storm surge, fluvial, groundwater and pluvial. Finally flood risk management measures put in place to mitigate the impacts of flooding on or from individual sites may impact on coastal process, hydrodynamics and sediment transport, which in turn may impact on designated habitats. All of these flood risk effects can occur during the construction, operation or decommissioning phases. As a result flood risk assessments need to take a long-term view.

The potential flood risk effects to areas surrounding development sites could be either negative or positive. Negative impacts could be that flood risk is increased to the surrounding area as a result of any land raising required to protect the power stations or the footprint and layout of the sites which could impact upon floodplain storage and flood flow pathways. Positive impacts could also arise, as flood risk mitigation

⁶³ SEPA in Scotland.

measures constructed as a result of the power stations could also provide flood risk protection for new and existing developments in the district. Similar negative and positive impacts could affect designated landscapes, for example, sensitive habitats could become more vulnerable to flooding, or as a result of improved defences—less vulnerable.

Climate change will increase flood risk from all causes. Coastal flood risk is likely to increase as a result of predicted increases in sea level and changes in storm surge. Changes to the seasonal distribution of rainfall and in the intensity of extreme rainfall events are also likely to increase flood risk. Climate change is also likely to result in changes to coastal erosion.

HOW THE NUCLEAR NPS ASSESSED FLOOD RISK FOR NEW SITES

The Strategic Siting Assessment of flooding and coastal erosion used the findings of the Appraisal of Sustainability site reports, advice from the regulators and comments received during a period for comment after the nominations were published.⁶⁴

The Government considered flooding issues from two perspectives. First, the possible threats to the safety of a new nuclear power station in an area exposed to flood risk. Secondly, the wider impacts of flood protection countermeasures on areas surrounding potential new nuclear power station sites. Overall, the Government assessed whether it is reasonable to conclude, at a strategic level, that a nuclear power station within the nominated site could be protected against flood risks throughout its lifetime, including the potential effects of climate change, storm surge and tsunami, taking into account possible countermeasures and mitigations.

For the purposes of this assessment the lifetime of the station includes allowing for the safe and secure storage of all the spent fuel and intermediate-level waste produced from operation and decommissioning until it can be sent for final disposal in a geological disposal facility (GDF). The time that will be required for the safe and secure onsite interim storage of spent fuel and intermediate-level waste is contingent on a number of factors. It is possible to envisage a scenario in which onsite interim storage might be required for around 160 years from the start of the power station's operation, to enable an adequate cooling period for fuel discharged following the end of the power station's operation.

In assessing both flooding and coastal processes the Government has been advised by the Environment Agency and the Nuclear Installations Inspectorate. Sites were assessed against the climate change allowances in Planning Policy Statement 25 (PPS25) and then UK Climate Projections 2009 (UKCP09) findings. This advice looked at the capacity of nominated sites to withstand flood risk and coastal erosion including the potential effects of climate change using modelling data that looks ahead to 2100.

Given the principles set out in the waste assessment, it is possible that there could be waste on site for longer than the climate change assessment has been able to look ahead. Predictions of potential climate change impacts become less certain the further into the future the assessments are for, and it is not practicable to consider beyond 2100 at this stage. Whilst the assessment has only covered the next hundred years, the regulators are satisfied that safeguards are in place, to ensure that only suitable sites achieve development and ongoing operational consent. Firstly, the capacity of new nuclear power stations to withstand the potential impacts of climate change will be reviewed in more detail as part of the site licensing process and as part of the Flood Risk Assessment that applicants must undertake in conjunction with their applications to the IPC. Secondly, any site which was selected for development and subsequent licensing would be required to periodically update these projections as part of the site licence conditions in particular through periodic review. Both these things are discussed in more detail later.

The Strategic Siting Assessment also considered potential impacts on site access and egress and the potential wider impact of flood protection countermeasures on areas surrounding the nominated sites.

The preliminary conclusion reached by Government having considered the range of inputs is that all the sites have been considered potentially suitable against the assessment of flood risk and coastal erosion including the potential impacts of climate change. The Government did have concerns about the ability to protect a new site at Dungeness from flood risk and coastal erosion throughout its operational lifetime, but the site was found to be unsuitable against criterion D6: Proximity to internationally designated sites of ecological importance.

The site assessments flag particular issues that the IPC must consider further if an application comes forward for a particular site in addition to the guidance which is given for the consideration of all applications in the Overarching and Nuclear NPS.

The Government is consulting on its preliminary conclusions until February 2010 and will continue to work with the Environment Agency (and others) to ensure that the Nuclear National Policy Statement reflects up-to-date assessment of the strategic flood risk to the site.

⁶⁴ These sources are available at <http://energy-nps-consultation.decc.gov.uk> and summarised in Part 5 of the draft Nuclear NPS.

INFRASTRUCTURE PLANNING COMMISSION

The Infrastructure Planning Commission (IPC) will, from 1 March 2010, deal with applications for development consent for new nuclear power stations. It needs to decide applications for development consent in accordance with any relevant NPS, subject to certain exceptions. Therefore the IPC will need to have regard to the policy and guidance included in both the Overarching Energy NPS and the Nuclear NPS on climate change adaptation, flood risk, coastal change and other relevant issues when considering an application and make its decisions accordingly. The advice of the relevant regulatory bodies on these issues is likely to be an important and relevant consideration for the IPC.

The Overarching NPS gives guidance to the IPC on climate change adaptation when considering proposals for energy infrastructure projects. The NPS sets out that to support planning decisions, the Government produces a set of UK Climate Projections and is developing a statutory National Adaptation Programme. In addition, the Government's Adaptation Reporting Power will ensure that reporting authorities (a defined list of public bodies and statutory undertakers, including energy utilities) assess the risks to their organisation presented by climate change. The IPC may take into account energy utilities' reports to the Secretary of State when considering adaptation measures proposed by an applicant for a new nuclear site.

The draft Nuclear NPS sets out further guidance for the IPC when considering applications for nuclear power stations. Applicants will have to consider the impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure. The NPS sets out that in consultation with the Environment Agency (EA) and Nuclear Installations Inspectorate (NII), applicants should use the latest set of UK Climate Projections and the Government's latest national Climate Change Risk Assessment when available, to ensure that they have identified appropriate measures to adapt to the risks of climate change.

Applicants will need to apply as a minimum, the emissions scenario that the Independent Committee on Climate Change suggests the world is currently most closely following—and the 10%, 50% and 90% estimate ranges. These results should be considered alongside relevant research which is based on the climate change projections.

Any proposed adaptation measures will be set out within the Environmental Statement (ES) to support the development consent application, and will cover the estimated lifetime of the proposed new infrastructure. Should a new set of UK Climate Projections become available after the preparation of the ES, the IPC will consider whether they need to request further information from the applicant.

Where adaptation measures are necessary to deal with the impact of climate change, the IPC will consider their appropriateness in terms of their potential impact on other aspects of the project and/or surrounding environment. The IPC will assess the project against the potential impact of more radical changes to the climate beyond that projected in the latest set of UK climate projections, taking account of the latest credible scientific evidence from such organisations as the Intergovernmental Panel on Climate Change or EA, and that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime.

SKILLS

As part of the Nuclear Site licence, the licensee is required to have adequate arrangements for the production and assessment of safety cases. The arrangements should include provisions for the safety cases to be written, independently assessed and peer reviewed as appropriate. In all cases, the documents should be reviewed and approved by Suitably Qualified and Experienced Persons (SQEP) of an appropriate level within the licensee's management. Where a Licensee uses contractors to produce whole, or parts of, safety cases the arrangements should ensure that the contractors used are appropriate for the work to be undertaken and that the individuals involved are SQEPs. The arrangements should include a robust system of control of the whole safety case production process including the initial choice of contractor, criteria for assessing the competence of contractor before, during and after the production of the safety case.

14 January 2010

Further memorandum submitted by Ofwat

This submission provides further information on our approach and what we have allowed the water and sewerage sector to help them adapt to the challenges of climate change in the 2009 price review. We also take this opportunity to respond to the points made by Water UK during their oral evidence session.

On 26 November 2009 we published our final determinations on the prices that water and sewerage companies can charge their customers, in England and Wales. Our determination means that customers' bills will remain broadly stable between 2010–15 but will still mean that over £22 billion will be able to be invested to improve services and safeguard supplies. These final determinations have been set in the longer context of the companies' 25-year strategic direction statements and will be a step towards meeting the challenges of the future, including those of climate change.

First of all I think it is important to state that our final determinations are a good settlement for the environment and will not create problems for the future. Throughout the process we worked with the Environment Agency and have accepted 99% of the National Environment Programme. This includes investments in over 100 catchment-sensitive management proposals, where previously there had only been two such schemes.

At the beginning of the 2009 price review process we asked every water company to produce a 25-year strategic direction statement. In each statement we requested the companies to take account of the risk of climate change—both mitigation and adaptation.

Adaptation in the form of increased resilience featured strongly in the companies' strategic direction statements and was reflected in their final business plans, submitted to us in April 2009. The proposals for increased resilience took the form of:

- network resilience projects, which protect from a number of hazards; and
- asset-specific flood resilience measures.

In total our final determinations included resilience schemes that will benefit almost 10 million consumers.

Climate change and allowing companies to meet the challenges of it, was central to our price review. While we allowed funding for a large number of adaptation projects we took an equally strong stance with mitigation schemes; allowing every stand-alone renewable scheme put forward by companies, but as you would expect we challenged the costs.

The table below sets out what we allowed in terms of adaptation and mitigation measures.

<i>Adaptation</i>	<i>Mitigation</i>
By 2016, 9.6 million people will benefit from increased service resilience to external hazards such as flooding.	We included all of the 33 stand-alone renewable energy schemes proposed within price limits.
We included £414 million for network and asset resilience schemes.	We included £57 million for renewable energy projects, delivering £8.8 million of operational expenditure savings to customers every year when complete.
Companies will protect more than 150 critical, at-risk assets and carry out 13 major network resilience schemes.	By 2015, companies will be generating more than 1TWh a year from renewable energy sources.
More than 100 catchment management and investigation schemes are included in price limits—at the last price review there were only two such schemes.	This saves the equivalent of more than half a million tonnes of CO ₂ e each year.

By taking both adaptation and mitigation into account in the 2009 price review we have taken a holistic view of climate change. We have never been short sighted on the challenges faced by climate change to the sectors and we will continue to drive companies towards best practise through taking into account the most up to date data and information.

We are currently in the process of preparing a document which highlights climate change good practice from the price review. Although this is work in progress, we will give you a draft copy of the main body of the document when we meet with you on Monday 18 January. We hope this helps to demonstrate how our approach to climate change encourages evidence-based responses to climate change adaptation. Our aim is for this document to further promote climate change adaptation (and mitigation) in the companies we regulate.

RESPONSE TO WATER UK ORAL EVIDENCE

We were quite surprised by Pamela Taylor's oral evidence to the Committee on 1 December 2009, and do not feel that this is representative of the whole industry. However, we understood that it was only a few weeks since we had announced our final determinations and some organisations may not have had the time to thoroughly read our national report.

The examples in our good practice document show that we have taken account of companies' proposals where they show that they have understood the risks and have plans in place to meet the challenges.

Adaptation is about making the right choices by using the most up-to-date information; this is particularly relevant in the water sector where it has such important long-term repercussions for customers in terms of the critical services they receive and the level of bills. Unfortunately the timing of the latest climate change projections (UKCP09) did not allow them to be utilised in the price review. However, we adopted a flexible solution to this problem.

In our original evidence to the Committee we outlined that we had defined a notified item on climate change and water resources. This would allow companies time to assess the UKCP09 projections and then come back to us between 2010–15 with proposals and costs for schemes to help them adapt to the impact of climate change on meeting the supply-demand balance.

Although initially received with some surprise by companies, our approach is now considered as robust and forward thinking. It is a flexible approach to regulation which does not tie companies into a five-year period. We are not closing the door in this crucial area. Indeed we have already had discussions with a number of companies to help them prepare for any proposals that they may bring to us.

FURTHER QUESTIONS

Leakage

We understand the perception of leakage. Seeing water leak out of pipes and then go down the drain is not a good image. However, eliminating leakage altogether would be a wasteful use of resources. The cost of eliminating leakage altogether, including the substantial environmental impacts, would far exceed the cost of balancing water supply and demand by other means, and that would mean higher, unsustainable bills for customers. Instead, we expect companies to keep leakage down to sustainable, economic levels. Below this level, the costs of additional leakage control would exceed the benefits. We expect each company to measure costs and benefits comprehensively—taking account of the environmental impact of leakage control and other options, and customers' views.

We expect companies to maintain leakage at current levels or to reduce it slightly over 2010–15. We understand some stakeholders wanting further reductions in leakage. In most cases, however, the evidence suggests that more significant reductions over this timescale would represent poor value for customers and the environment. Moreover, with the expanding pipe network, maintaining leakage at current levels still requires companies to increase leakage control activity because even new pipes leak.

Our final determinations will see companies, by 2015, saving 100 billion litres of water a year through, leakage targets, metering assumptions and water efficiency targets.

For the first time we have included water efficiency targets as part of the price review process. Like leakage targets they are individual to the company. They will play a major part in driving water efficiency by companies and their customers.

Each company has a duty to promote the efficient use of water by customers. We monitor the companies' performance against this duty. Our targets are made up of two elements.

- A base service water efficiency target, which is equivalent to one litre per property per day for all companies. This target reflects the level of activity that we judge companies should undertake to meet their duty.
- A sustainable, economic level of water efficiency, which forms part of a best value strategy to balance the supply and demand for water, bringing benefits to consumers and the environment.

CONCLUSION

Climate change was a key issue for us in the recent price review. We set out our approach in our 2008 climate change policy statement. We encouraged companies to propose schemes which tackle the challenges in a phased, responsible and appropriate manner. However, we will not risk companies wasting their customers' money on adaptation measures or schemes that may not be needed or do not go far enough to meet the challenges. While the majority of the water and sewerage sectors understood our stance, and welcomed the approach, Water UK obviously felt that companies would rather have the customers' money up front before justifying the expenditure. This would not have maintained a fair balance of risk and would not have promoted an understanding of the UKCP09 scenarios and their implications for future water resources.

15 January 2010

ISBN 978-0-215-54522-0



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