
Executive Summary

The Climate Change Act put in place a process for assessing and managing the risks and opportunities to the UK from climate change. The Act established the Adaptation Sub-Committee (ASC) of the Committee on Climate Change to provide independent and expert advice on how to assess climate risks and to report regularly on the UK's progress in preparing for the future climate.

This report provides our second assessment of the UK's preparedness, following our first review in September 2010. We start to develop a set of indicators against which to assess and track the UK's preparedness. We focus on three of the priority areas identified in our first report – land use planning, managing water resources, and designing and renovating buildings.

The headline messages are:

- The UK is coping with the current climate, but some sectors such as water supply are near their limits. Vulnerability to climate change is potentially increasing as a result of patterns of development in some areas and demographic trends such as the ageing population.
- There are low-regret actions that could be taken now to reduce vulnerability – for example measures to improve water efficiency, reduce damages to buildings from flooding, and protect buildings from overheating in summer. These measures would save householders money today. However, we found limited evidence of uptake of such measures, particularly in existing homes, reflecting barriers to action. This indicates the need for new policy approaches.
- Climate risks appear not to be fully incorporated into some major strategic decisions, such as land use planning and investment in water infrastructure. Embedding climate change more fully into decision-making could reduce future adaptation costs, such as building new flood defences and maintaining existing defences, and also ensure that climate risks are appropriately balanced against other risks and benefits.

Key messages by chapter are:

Current and future vulnerability to climate change [Chapters 2, 3 and 4]

- The UK is near the limits of coping with the current climate in some sectors and could be pushed over the edge by climate change. For example:
 - While only 8% of water resource zones in England are currently at risk of falling short of demand during a severe drought, this could increase to around 45% by 2035 without remedial action.
 - Security of water supply for consumers is good and improving, but there remains an environmental cost. Environment Agency statistics indicate that 11% of rivers and 35% of groundwater aquifers in England are “probably at risk” of environmental damage due to water abstraction.
- Patterns of development are potentially increasing the UK's vulnerability in some areas. We found that since 2001:
 - In almost all of the nine English local authorities studied, development in areas of flood risk had increased, and in four of them the rate of development was higher than across the locality as a whole.
 - Three of the four coastal authorities saw an increase in development in areas of eroding coastline, and in two of them the rate of development on unprotected coastline was higher than across the authority as a whole.
 - The area of hard surfacing increased in five of the six urban authorities studied, primarily at the expense of urban greenspace, which declined in all six. This is likely to exacerbate surface water flooding risk and the urban heat island effect.
 - These increases in vulnerability may have been offset at least to some degree by increased investment in flood defences and the greater use of adaptation measures in new homes built.
- Some factors increasing vulnerability of the UK are not controllable, such as changing demographics, most notably the ageing population. Old people are most at risk of heat stress and respiratory illness caused by photochemical smog.
- The impacts of climate change are borne disproportionately by some groups such as the elderly and in some locations such as low-lying coastal areas.

Low-regret opportunities for adaptation [Chapter 5]

- We identified a number of low-regret actions for buildings that could save individual householders money, as well as reducing the UK's vulnerability to climate change. These include measures to improve water efficiency (such as low-flow taps and showers), reduce the damages from flooding (such as airbrick covers and door-guards), and protect buildings from overheating in summer (such as increasing window shading).
- We found some uptake of measures in new housing, for example nearly all development in floodplains included at least one measure to manage flood risk, but much more limited evidence of uptake in the existing building stock. This is important given that the existing buildings will still dominate the total stock in future.
- In order to address barriers to uptake, new policy approaches may be needed. In some cases, incentives and improved information may be effective, for example water efficiency improvement requires the wider use of water meters together with consumer behaviour change. In other cases, for example for adapting new housing, tighter regulations may be required to bring all suppliers up to the best industry standards.

Long-term decision-making in land use planning and water resources [Chapters 3 and 4]

- In land use planning, we found limited evidence of strategic approaches to address climate risks in local authority development plans.
 - Local authorities appear to rely on property-level measures to offset the increased risk from locating new development in areas at risk from climate change, such as floodplains.
 - While we have demonstrated that property-level measures are beneficial, they will not deal with all risks by themselves and may lock in patterns of development that require an ongoing commitment to flood defence.
 - In order to manage vulnerability more effectively, local authorities should explicitly weigh up the potential long-term costs of climate impacts against social and economic benefits from development that are more immediately realised.
- Water companies have not yet made any specific investment in climate adaptation to tackle potential shortfalls in water supply. Delay of investment could lead to higher costs in the future or increased risks of water shortages. We identify scope to better manage the gap between supply and demand caused by climate change through: a greater level of ambition on water efficiency programmes; reforms to the abstraction regime to reflect water scarcity; and more robust approaches to factoring climate change uncertainty into long-term investment planning.

Climate Change Risk Assessment [Chapter 6]

- This report also includes our high-level advice on the principles for the Government's forthcoming Climate Change Risk Assessment (CCRA). We recommend that the CCRA should:
 - **Characterise uncertainties** – transparently report the assumptions made and openly explore the implications of uncertainty in both climate and socio-economic scenarios.
 - **Provide transparent comparison of risks** – ensure that the full range of economic, social and environmental risks and opportunities are assessed and compared, including those that are less easily quantified (particularly environmental risks).
 - **Cross-check results with current vulnerability** – an assessment of current vulnerability is a good starting point for assessing future climate impacts, because it draws on what is already known, establishes a baseline against which changes in risk and vulnerability can be tracked over time, and helps to make the case for prompt action to reduce current risks.

Future work of the ASC [Chapter 6]

- We will continue to develop and implement our indicator framework for measuring progress on preparing for climate change in the UK:
 - **Measure progress** – building on the work in this report, we will develop a more comprehensive set of indicators across the priority areas for adaptation, including those not covered so far (emergency planning, managing natural resources, and other infrastructure sectors).
 - **Input into development of the Government's economic analysis of adaptation and National Adaptation Programme** – we will work closely with Defra over the next year to advise on the identification of adaptation measures across key sectors to inform the National Adaptation Programme.
 - **Review lessons for the next Climate Change Risk Assessment (CCRA)** – to help in scoping the second CCRA, we will undertake an assessment of the first CCRA in 2012-13.