

Sector Perspective

- The UK's business, industry and services sector is extremely diverse, covering a wide variety of activities and all scales of operation from micro-businesses to multinational companies. At UK Government level, primary responsibility for this sector resides with the Department for Business, Innovation and Skills and with HM Treasury. The Devolved Administrations also play an active role in enabling and assisting the sector in Scotland, Wales and Northern Ireland.
- This sector is highly vulnerable to projected changes in climate, including higher average temperatures, changing rainfall patterns, changes in sea levels and changes in the frequency and intensity of extreme weather. Factors underlying this vulnerability vary between sub-sectors, but include dependence on large fixed or natural assets and on long and complex supply chains.
- In many cases, climate change may simply lead to an increase in existing risks. For instance, the sector already has to cope with disruption to transport infrastructure due to extreme weather. Climate change may result in changes to the duration and/or frequency of such weather.
- The business, industry and services sector is significantly influenced by international issues, including investments, supply of products and materials, and international markets for UK goods and services. Other social and economic drivers, such as population growth and shifts in consumer values, also affect the sector.
- There are strong interdependencies between this and other sectors (e.g. transport, energy, water and the built environment). These include the connection between business and industry, national infrastructure provision and the natural environment. In particular, potential climate impacts such as overheating of buildings and increased pressure on water resources may have major knock-on effects for this sector.



Business, Industry and Services

Climate change is projected to result in further changes in temperature, rainfall patterns and sea levels, as detailed in the UK Climate Projections (UKCP09) analysis. Some of the impacts on the UK business, industry and services sector may be positive and potentially profitable; others may be negative and may pose a variety of operational threats, as well as risks to revenue streams and brand value.

The Climate Change Risk Assessment (CCRA) has completed an assessment of a range of impacts for which this sector may need to prepare. Due to the sector being so large and diverse, this assessment was limited to the following sub-sectors: financial services; tourism; food and beverage manufacturing; oil, gas and mining; and chemical manufacturing. These sub-sectors serve as illustrative examples, highlighting the range of climate-related issues and the challenges the sector as a whole faces. Some of the key points from this assessment are summarised here.

The results presented here do not take account of changes in society (e.g. population growth, economic growth and developments in new technologies); nor do they take account of responses to climate risks (e.g. future or planned Government policies or private adaptation investment plans).

The assessment of flood risk for the CCRA has assumed that there are no changes in existing flood and coastal erosion risk management measures; the analysis takes account of current flood defences and protection against coastal

erosion, but does not include any future changes as a result of adaptation policies or deterioration of existing flood defences and coastal protection measures. The figures here apply to river and tidal flooding in England and Wales only.

All costs presented are based on present-day prices.

Focus on... The Financial Industry

Climate change poses a significant threat to financial organisations, both through direct impacts on operations (e.g. damage to buildings and infrastructure) and indirect market-related risks (e.g. to investment performance and lending portfolios). Indeed, this industry is exposed not only to potential climate risks in the UK, but also to those around the world. In 2005, for instance, Hurricane Katrina had a significant 'ripple' effect on the performance of UK investment funds.

Currently, few UK financial institutions incorporate climate risk and adaptation considerations into their governance and risk management processes. The potential consequences may include (i) reduced financial and credit performance; (ii) damage to reputation by falling short of growing stakeholder expectations on adaptation; (iii) investor pressures for climate risk and adaptation disclosure, and climate resilient risk management; (iv) legal liabilities, if decisions fail to take into account the reasonably foreseeable impacts of climate change and information is not provided on the material risks of climate change; and (iv) missed opportunities to finance adaptation.

Focus on... The Insurance Industry and Mortgage Lenders

The insurance industry has seen growth in weather-related claims in recent decades and annual payouts resulting from flooding are projected to rise significantly in future. This may have important implications for insurance providers' capital requirements.

As flood risk increases, a growing number of properties may be subject to higher insurance premiums. Property owners (and occupiers) may potentially find it difficult to obtain insurance and, in turn, have difficulties obtaining mortgages. This has the potential to impact both the insurance industry and mortgage lenders.

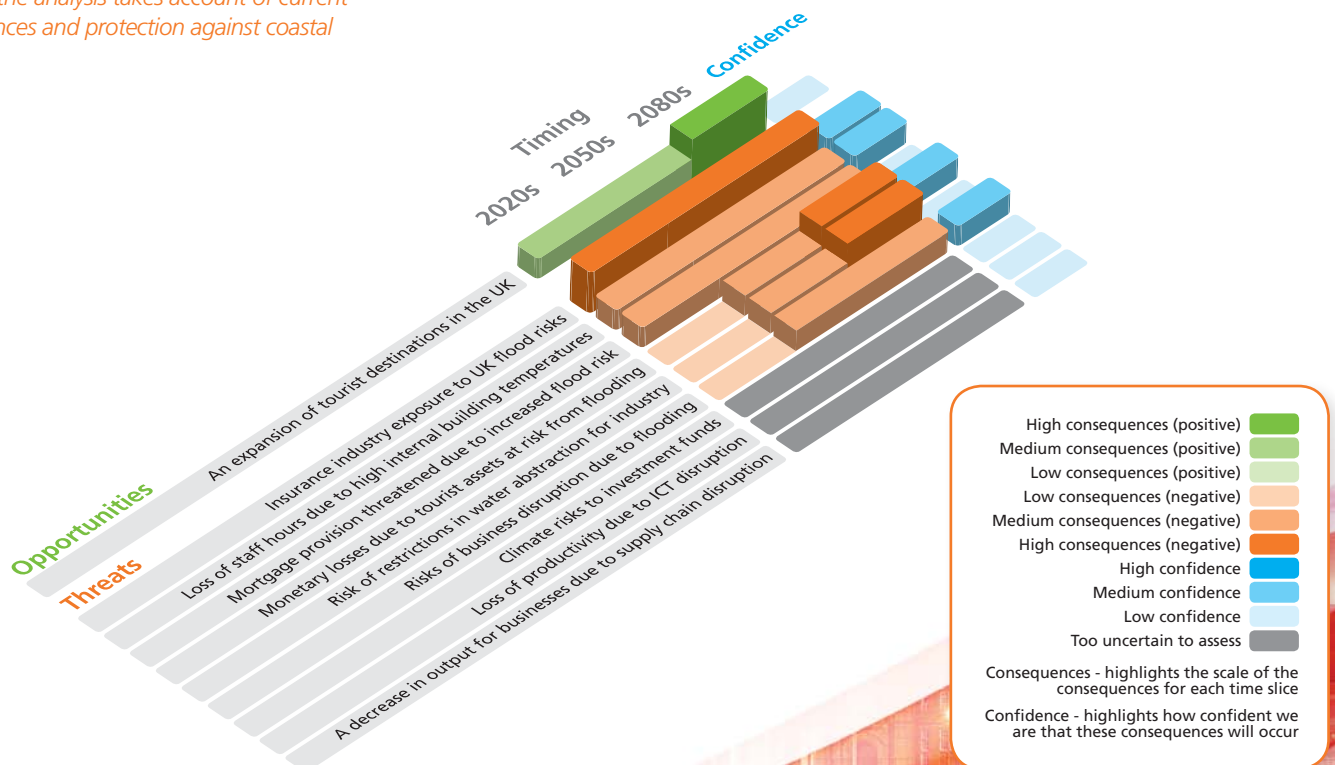
Confidence

M

Average annual insurance claims for flood-related damage: between £0.5 billion and £1 billion by the 2080s (current figure: £200 million to £300 million).

L

Value of mortgages at risk due to difficulty in obtaining flood insurance: between £2 billion and £9 billion by the 2080s.¹



Focus on...Business Continuity

Higher temperatures and extreme weather may present a range of risks to business continuity. These risks include: disruption to supply chains and transport links; interrupted supply of essential services such as energy, water and information and communications technology (ICT); damage to assets and lost productivity due to disruption to operations; and workforce absenteeism.

These risks may be significant, for example with respect to disruption to technology and lost productivity. An estimated 84% of UK businesses are heavily dependent on ICT and these systems may potentially be interrupted and disrupted more frequently, although the scale of this risk is difficult to quantify. Across the sector, lost productivity may result either from flooding or from overheating of workplaces due to warmer summer temperatures.

Confidence

M Average annual cost to businesses of disruption due to flooding: between £26 million and £72 million by the 2050s and between £34 million and £96 million by the 2080s (current figure: £20 million).

M Staff days lost due to workplace overheating (based on 26°C threshold): an annual cost of between £1.1 billion and £5.3 billion by the 2050s, between £1.2 billion and £15.2 billion by the 2080s (current estimate: £0.77 billion).

Focus on...Water Availability for Industry

The amount of water that can be abstracted for public water supply, agriculture and industry is sensitive to the annual water balance and subject to changing licence conditions. A shift in seasonal and/or total availability of water resources, as a result of climate change, has the potential to have significant impacts on industry in the UK.

By the 2050s, there may be a significant decrease in the number of rivers where sustainable abstraction² is possible and this situation may grow more severe by the 2080s. Water abstraction by industry is projected to become more constrained in the river basin regions of south-east England and south-west England, as well as in the Anglian and Severn river basin regions; in these four regions, 13% of total UK industrial abstraction takes place. The change in north-west England is projected to be less marked, but, due to the large amount of industrial abstraction in this area, a small shift in long-term water availability could translate into a significant risk to industrial processes.

Confidence

L Reduction in number of sites with sustainable industrial abstraction³ (example): between 29% and 83% by the 2050s for south-east England.

Focus on...the Tourism Industry

Warmer temperatures may encourage expansion of existing UK tourist destinations and establishment of new ones, with potential for the UK to capture some of today's southern European tourist market. The trend towards higher visitor numbers all year round may also accelerate.

Climate change may also, however, bring risks as well as opportunities for the UK-based tourism industry. A number of tourism assets are currently exposed to river and tidal flooding, with around 33,000 tourist and leisure facilities in England alone currently within areas that could be affected by a river or tidal flood.⁴ Sea level rise and more frequent extreme weather may mean that tourist assets face a greater risk of flooding in the future. In addition, sea level rise may reduce existing beach areas unless there is some relocation of existing sea defences.

Confidence

L Increase in expenditure by domestic and international tourists visiting UK destinations (including effect of population increase): between £1.2 billion and £4.2 billion by the 2020s, between £7.8 billion and £11.1 billion by the 2050s and between £11.3 billion and £28.9 billion by the 2080s.

M Increase in flood risk to existing tourist assets: beach area lost due to sea level rise may be between 12 km² and 61 km² by the 2080s (approximately 3% to 7% of total beach area).



¹ Assuming the value at risk is 5% to 15% of the total mortgage fund value of properties at significant likelihood of flooding (i.e. an annual chance of flooding greater than 1 in 75).

² Maintaining the current level of environmental flows required to protect water ecosystems.

³ Based on water availability in the local catchment only.

⁴ Probability of river flood occurring: at least once every 100 years. Probability of tidal flood occurring: at least once every 200 years. (Protection provided by flood defences is not taken into account.)

The Challenge of Adaptation

The ability to adapt to climate change varies substantially between different industries and different organisations within this sector. A number of large UK-based national and multinational companies are taking adaptation seriously and showing significant sophistication in their response to the challenge. However, the vast majority of organisations active in the sector have yet to recognise climate change as a material risk, or they view it as a long-term issue of little current relevance.

Organisations that are able to respond positively to the challenge may be able to achieve significant commercial and competitive advantages. Companies that are by nature innovators are among those best placed to do so. This is because they are more likely to have the necessary expertise in understanding the relationship between risks and rewards and to act accordingly. Potential opportunities for positive action include:

- Exploiting market shifts by developing new products and services.
- Improving internal business processes to cope with the direct and indirect impacts of climate change.
- Showing leadership and setting an example to other businesses.

Commercial opportunities stimulated by climate change may arise, in particular, in areas of UK strength (e.g. science and engineering), with a wide range of green technologies offering potential investment opportunities.

The Adaptation Reporting Power contained in the Climate Change Act 2008 is one of the main mechanisms enabling the UK Government to influence businesses and help them integrate climate change adaptation into mainstream management practices. The Department for Environment, Food and Rural Affairs (Defra) is providing advice to businesses on the implementation of climate change adaptation strategies.

One important factor acting as a barrier to adaptation actions in this sector is uncertainty regarding the shape of future markets in the UK and worldwide. More comprehensive risk analysis is also needed in a number of areas including:

- The potential consequences of climate change for UK financial institutions.
- Supply chain risks and factors influencing them.
- The extent to which 'UK plc' may be vulnerable to climate impacts in other parts of the world, in terms of how those impacts may affect international markets, investments and supplies of materials.

Where to Get Further Information

For copies of the CCRA Business, Industry and Services Sector Report, the CCRA Evidence Report and Devolved Administration Reports, please visit www.defra.gov.uk/environment/climate/government/

How the CCRA was conducted

The CCRA reviewed the evidence for more than 700 potential climate impacts on the UK economy, society and environment. Over 100 of these impacts across 11 sectors were taken forward for more detailed analysis, having been selected on the basis of likelihood, potential consequences and how urgently adaptation action may be needed to address them.

A plausible range of climate change scenarios was used in the analysis. Some aspects of socio-economic change (e.g. population growth) were also taken into consideration. Adaptation policies that are planned for the future were not considered, so that the underlying level of risk could first be compared across sectors.

The results presented here are based on the UKCP09 Medium emissions scenario for the 2020s (2010-2039) and the Low, Medium and High

emissions scenarios for the 2050s (2040-2069) and the 2080s (2070-2099). A range of climate projections representing lower, central and upper estimates were considered within each emissions scenario.

Risks are categorised as low, medium or high based on their economic, social and environmental consequences.

The CCRA findings are also categorised as having low, medium or high confidence. The level of confidence is the degree to which the findings are considered valid, based on the type, amount, quality and consistency of the evidence studied.

Further information on how the CCRA results should be interpreted is presented in the CCRA Evidence Report. www.defra.gov.uk/environment/climate/government/