



A changing climate for business

business planning
for the impacts of
climate change

The UK Climate Impacts Programme (UKCIP)

- The UK Climate Impacts Programme (UKCIP) *“helps organisations to assess how they might be affected by climate change, so that they can prepare for its impacts”*.
- It is funded by the Department for Environment, Food and Rural Affairs (Defra) on behalf of the UK government and devolved administrations and is based at the Environmental Change Institute (ECI), University of Oxford.
- It promotes and co-ordinates stakeholder-led research on the impacts of climate change and adaptation, it facilitates stakeholder partnerships and capacity-building programmes, and it provides common tools and datasets, all of which are free.

www.ukcip.org.uk



The chameleon

The chameleon is chosen for the cover illustration as it provides an excellent set of metaphors for adaptation to a changing environment. As the surrounding environment changes the chameleon adapts its skin colour in three different but related ways:

- automatic response
- conscious controlled response
- chain-reaction response to other parts of the body.

It can be seen that this reflects the ways in which human society, and the individuals and organisations which make up society, will also adapt to a changing climate.

Building adaptive capacity and delivering adaptation actions

This publication makes several references to the distinction between 'building adaptive capacity' and 'delivering adaptation action'. The following definitions may be useful to readers.

Building adaptive capacity

is putting in place all of the support systems, legislative and policy framework(s) which will encourage, allow or require individual businesses to undertake adaptation. Measures will use both 'carrot' and 'stick'. Such work is an important precursor to delivering adaptation action.

Delivering adaptation action

involves making operational or managerial changes that respond to the opportunities or threats presented by the changing climate. These might include such actions as: re-locating a business to avoid the risk of flooding; establishing a siesta lunchtime break to avoid having to work through the excesses of summer temperatures; or planting new crops which can be grown in hotter, drier summers.

Delivering adaptation action is the role of individual businesses, and of other organisations such as local authorities. Helping to build adaptive capacity is the principal role of trade associations and professional bodies, as well as government departments and UKCIP.

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Introduction

A new initiative for engagement with business on climate related risks has been underway through the UK Climate Impacts Programme (UKCIP).

A pilot project, carried out during 2004, involved selected trade associations and professional bodies as part of UKCIP's overall business programme called A Changing Climate for Business (CCFB). As a result UKCIP is now able to provide clear, practical advice to help UK businesses begin to address the implications of a changing climate.

This report presents guidance for business and business support organisations, based on the experience of the pilot project. It is particularly aimed at busy decision-makers. The first part provides key messages and suggestions for initial actions for directors and senior managers of businesses and for organisations such as trade associations or professional institutions. The rest of the document provides more detailed evidence of future climate and techniques for understanding and assessing likely threats and opportunities. These are organised in separate sections, signposted and colour-coded for easy reference.

We hope that this report will inspire you to pursue climate change impacts and adaptation work in your own organisation. Members of the UKCIP team will be pleased to discuss how to help you.

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Headlines for business

Key messages

The climate is changing in the UK and in other countries around the world

Go to: Climate scenarios in the 21st Century



Some of the most powerful evidence of climate change is provided by nature: changing seasons, earlier blossom and buds on plants or the earlier arrival of migrating birds. This is the subject matter of the science of phenology.

This is the famous hockey stick curve which shows global temperature change over the past thousand years and a range of projections for the 21st century.

Image courtesy of IPCC

Businesses and business sectors are particularly vulnerable to climate change if they:

- are currently affected by weather events
- make long term investment, especially infrastructure

Go to: Weather impacts on business



Infrastructure for transport and utilities is particularly vulnerable, and therefore puts at risk transport and utilities companies and those businesses that use their systems.

After the increase in claims in 1993 following severe weather, there has been a steady rise in the costs of business claims for weather damage.

Image courtesy of Network Rail

Image courtesy of Association of British Insurers

Businesses that have global markets or suppliers will probably be affected by climate change in other countries

Go to: Climate impacts by sector



Agriculture provides a clear example of climate change in other countries affecting the UK. Vineyards are now common in Southern England.

The adverse affects to maple syrup production could significantly harm the economy of Northeast states in the USA. Canada stands to benefit significantly from the northerly drift of maple trees.

Image courtesy of Clean Air-Cool Planet

Remember that climate change presents businesses with commercial opportunities as well as threats

Go to: Climate impacts by sector



Many opportunities are expected to arise from increased summer temperatures. Pavement cafes and even siestas become a possibility

Changes in expected climate are now being factored into the development of food and drink products in the UK.

These are the key messages about climate change and its impacts on business, and suggestions of what to do next to start to adapt.

The changing climate could be an issue for your business and could well affect your bottom line

Go to: Assessing climate impacts



Carlisle firefighters clearing out their station after the January 2005 floods.

Image courtesy of Carlisle News & Star

The retail sector is very responsive to changes in weather and many large chains already make use of the Met Office to provide detailed forecasts and provide evidence for tracking weather impacts.

The weather has impacts across a range of business areas, not just the obvious ones, and not just 'environmental' ones

Go to: Assessing climate impacts



Climate impacts on people, as customers for goods and services and as members of a workforce, for whom working conditions, both inside and out, can change beyond acceptable thresholds.

Nearly all businesses make use of premises and transport systems, both of which are vulnerable to weather-related events like floods, storms, subsidence.

Image courtesy of Carlisle News & Star

Adaptation to a changing climate needs to be complemented by strategies for reducing greenhouse gas emissions (mitigation)

Go to: Climate impacts by sector



Adaptation strategies must avoid increasing greenhouse gas emissions, thereby contributing to further climate change

Image courtesy of M. Robinson

Sustainable development, and especially sustainable construction, needs to be designed with a future climate in mind

Image courtesy of Energy Saving Trust

An important first step is to give someone responsibility for work on adapting to climate change and to provide them with the necessary support

Go to: Building capacity to adapt to climate risks



Climate risk management needs to be incorporated into mainstream business management strategies and procedures.

A 'climate risks champion' with support from senior management, can assist in driving forward the climate impacts and adaptation agenda throughout the company.

What to do next?

There are two types of action that your organisation can embark upon:

1. **actions which you can take on your own, without reference to UKCIP**
2. **actions which use UKCIP tools, resources and projects.**

These actions are the responsibility of most decision-makers, but especially:

- directors or senior managers of an individual business
- middle managers within an individual business
- officers from a business support organisation
- members of a professional institute or trade association
- consultants who work with business on climate impacts and adaptation.

Actions you can take alone	Reference to relevant section of this report
<p>Use this publication as a reference point to get you started Request further copies from UKCIP if required.</p>	All
<p>Assemble evidence of the impacts on your business from recent (historic) weather-related events This is useful to understand better the issues and to use as evidence with which to engage others (such as the climate change sceptics).</p>	Weather impacts on business
<p>Obtain support and resource commitment from senior management There is not much resource requirement to get started: just a few days (or even hours) of allocated staff time at first.</p>	Building capacity to adapt to climate risks
<p>Decide how to manage the work on impacts and adaptation Will the work be mainstreamed from the start? Will it be managed as part of another business agenda (such as risk management)? Can it be included in an existing management system (e.g. ISO9001 or ISO14001)?</p>	Building capacity to adapt to climate risks
<p>Make sure that someone has overall responsibility for this work Consider appointing a 'climate risks champion' with clear authority and reporting lines.</p>	Building capacity to adapt to climate risks
<p>Undertake an initial climate impacts assessment through an in-house workshop event Use the Business Areas Climate Impacts Assessment Tool (BACLIAT) and involve senior staff from all parts of the business.</p>	Assessing climate impacts
<p>Organise an in-house training event/programme or prepare an in-house publication on key impacts and possible adaptation strategies It is important that all parts of a large organisation have some basic understanding of the issues and planned responses.</p>	Assessing climate impacts



Actions you can take alone (continued)	Reference to relevant section of this report
<p>Commission research on impacts and possible adaptation responses for your business and sector</p> <p>Important sectors that are significantly affected by climate risk, such as insurance, have already found it useful to undertake research on strategic climate-related impacts and potential adaptation responses.</p>	Building capacity to adapt to climate risks
<p>Build the capacity of your business or sector to respond to a changing climate by helping to set codes, standards, and good practice.</p> <p>Some things are outside your control: for example they may need legislation. You can play an important role in, for example, lobbying to effect this sort of change.</p>	Building capacity to adapt to climate risks
Actions you can take with the help of UKCIP tools, resources and projects	
<p>Ask UKCIP for advice and support</p> <p>UKCIP is building its business support team, so will be better placed to advise businesses on technical and project management issues from Autumn 2005, but its resources will still be limited.</p>	UKCIP tools and resources
<p>To understand more about risks from climate change, explore the UKCIP website and/or ask for copies of UKCIP's publications, all available free.</p> <p>A quick scan of the website will give you a good overall impression of the issues and the many resources at your disposal. www.ukcip.org.uk</p>	UKCIP tools and resources
<p>Consider taking part in one of UKCIP's business programmes</p> <p>UKCIP is looking for further partners from business support organisations (e.g. trade association or professional body), individual businesses and consultants working with business on climate change risks.</p>	Future CCFB programme and how to join
<p>Use the UKCIP Adaptation Wizard as an adaptation project management tool</p> <p>The Wizard provides a process for adaptation project management, signposting clear stages and tasks to be undertaken. It can be used electronically or on paper.</p>	UKCIP tools and resources
<p>Undertake a formal risk assessment using the UKCIP risk framework</p> <p>The UKCIP climate risk, uncertainty and decision-making framework takes you through a systematic process from a quick scoping exercise to detailed, quantified analysis.</p>	UKCIP tools and resources
<p>Calculate the costs of not adapting to climate change using the UKCIP costing methodology</p> <p>For major impacts you can compare the costs of adaptation with the costs of impacts if no adaptation is carried out.</p>	UKCIP tools and resources

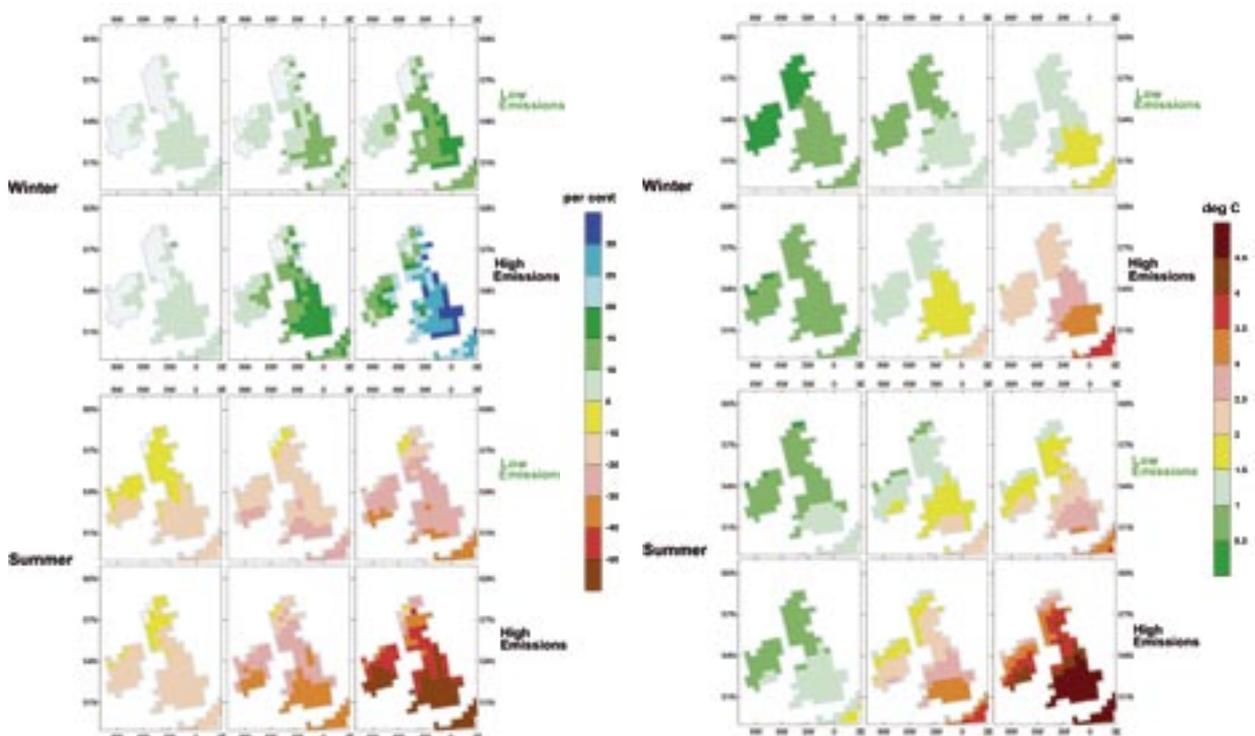
Climate scenarios for the 21st century

Sources and reliability of data

The following maps and tables are based upon the UKCIP02 scenarios¹, which describe how the climate of the UK may change during the course of this century. These scenarios are based on model results from the UK Met Office's Hadley Centre and were prepared by Tyndall researchers for the UK Climate Impacts Programme. The described range of plausible futures aims to raise awareness of regional climate change and assist in long-term planning. They provide the latest information for policy makers, those researching impacts of climate change, businesses and organisations, and the general public. The scenarios are explicitly linked to four greenhouse gas emissions scenarios described in the Intergovernmental Panel on Climate Change (IPCC²) Special Report on Emissions Scenarios (SRES). The IPCC was established to assess scientific, technical and socio-economic information relevant for the understanding of human induced climate change, its potential impacts and options for mitigation and adaptation.

Summer / winter precipitation under 2020s, 2050s and 2080s low and high emissions scenarios

Summer / winter temperatures under 2020s, 2050s and 2080s low and high emissions scenarios



How often will extremes occur?	Anomaly	2020s	2050s	2080s
Mean temperature				
A hot '1995-type' August	3.4°C warmer	1	20	63
A warm '1999-type' year	1.2°C warmer	28	73	100
Precipitation				
A dry '1995-type' summer	37 % drier	10	29	50
A wet '1994/95-type' winter	66 % wetter	1	3	7

The percentage of years experiencing various extreme seasonal anomalies across central England and Wales for the medium-high emissions scenario. The anomalies shown are the difference from the baseline of the average 1961-1990 climate.

¹Hulme et al., (2002) Climate Change Scenarios for the United Kingdom: The UKCIP02 Scientific Report, Tyndall Centre for Climate Change Research, School of Environmental Sciences, University of East Anglia, Norwich, UK. <http://www.ukcip.org.uk/scenarios/>

²www.ipcc.ch

A simple summary of climate change for the UK in the 21st century**Long-term / seasonal averages**

Warmer, drier summers

Milder, wetter winters

Rising sea levels

Significant decrease in soil moisture content (summer and autumn)

Extremes**More very hot days**

Extremes of temperature increase in intensity as well as frequency

More intense downpours of rain

Extremes of precipitation increase in intensity as well as frequency

Shorter return periods for high water levels at coast

Uncertain changes in storms and storm-tracks – a possible increase in winter storms

Uncertainty

Different aspects of the climate have different levels of uncertainty associated with them. So, climate scientists have high levels of confidence in changes in average temperature and precipitation, but less confidence in the future patterns of wind, storms or extreme events.

Using the data

Different business areas are sensitive to a variety of different climate variables such as: average winter rainfall, number of days of frost, changes in sea level, etc. Start by considering the way that weather has an impact on your organisation, or your competitors and other businesses in your sector. Evidence of these recent impacts will provide an understanding of the way different types of weather affect your operations. For initial impacts assessments it may be enough to consider qualitatively the broad directions of changes in climate variables, as indicated in the summary above.

Did you know?

In 2003, a new UK highest temperature record of 38.5°C (101.3°F) was reached in Brogdale, near Faversham, Kent. (BBC News, 30 September 2003)

Looking ahead

In 2008 UKCIP will publish another package of climate change scenarios for the UK. This will take account of the latest developments in climate modelling and science, and be designed to meet the changing needs of a growing body of stakeholders. In particular we expect that the next package of climate change information will include probabilistic data (allowing better quantification in risk assessment), and better information about near-term changes (allowing greater confidence in short-term planning). UKCIP intends to consult with a wide range of users to establish their differing requirements for data sets.

The Gulf Stream

The Gulf Stream is a warm water current that is partially responsible for keeping the UK much warmer than other countries on the same latitude. It is part of a larger system of ocean currents, often called the 'conveyor belt', that is made up of a circulation of warm salty surface water northwards in the Atlantic Ocean and a circulation of deep, cold water southwards. Various media reports have dramatically suggested that global warming could cause increasing quantities of meltwater in the Northeast Atlantic to disrupt this conveyor belt, 'switching off' the Gulf Stream altogether and resulting in significant cooling over Northwestern Europe. The latest climate modelling experiments from the Hadley Centre looked at the effect of increasing greenhouse gas concentrations on the Gulf Stream. These found that the Gulf Stream did slow down – by about 20% by the middle of the century – but it didn't completely switch off. This predicted reduction in the ocean circulation, and the resultant loss of heat to the UK from the Gulf Stream, are already included in the UKCIP02 scenarios. It must be emphasised that all the UKCIP02 results presented on these pages include the effect of the weakened conveyor belt.

“We have climate change adaptation in our consciousness and have [provided] a briefing and workshop session for members. From that we have produced an output paper and will continue to monitor and be involved.”

Simon Barnes, Technical Manager, Society of Motor Manufacturers and Traders

Weather impacts on business

300,000 UK businesses affected by floods

A survey by insurance company Zurich found more than 300,000 UK small and medium-sized businesses have been affected by a flood in the past five years, costing them a total of £864 million. On average, business owners said they were unable to use their premises for up to two weeks as a result of flooding. Fourteen per cent of businesses in London - 94,000 companies - said their premises had been flooded. Proportionally, however, a higher percentage of businesses operating in Scotland, East Anglia, the East Midlands and Wales suffered from flooding than their northern and southern counterparts. (Leicester Mercury, 18th November 2004)

Insurance companies suffer

Lloyd's suffered net claims of £1.2 billion from autumn 2004's devastating US hurricanes. The total natural catastrophe bill last year [2004] for the insurance industry as a whole was £26 billion. (The Evening Standard, 5th April 2004)



110,000 calls in a day

Storms across northern Europe meant staff at Danish insurer TrygVesta faced a busy January 2005. The insurer said the violent storm resulted in 110,000 calls to its telephones in one day, almost as many as it had received in the entire previous month. (Insurance Day, 25 April 2005)

The cost to farming

National Farmers' Union chief cereals adviser, Paul Ibbott, estimated the 2004 weather could cost the industry anything between £300m and £500m in drying costs, reduced quality and the fact that some oilseed rape has been left in the ground. (Farmers Guardian, 8th October 2004)

Wet summer means poor harvest

The poor harvest caused by summer 2004's wet weather did more financial damage to farming than the foot-and-mouth crisis, Lord Haskins, the Government's rural adviser said. (Birmingham Post, 28th August 2004)



The cost of 1995's hot weather

Net losses for UK agriculture as a result of the 1995 climate anomalies are estimated at about £180 million. Gains to arable crops are estimated at £30 million, but large losses, of around £200 million, were sustained in livestock farming. Savings in the mild winter of 1994/95 amounted to £220 million in domestic gas consumption and £95 million for the public administration/commerce/agriculture sector. In the hot summer there was an added cost of £34 million to domestic electricity customers but a saving of £74 million on domestic gas consumption. (Climatic Research Unit, University of East Anglia 1995)

British wine industry could thrive

Global warming could put a sparkle into the British wine industry as southern England becomes the best place to grow champagne grapes, Environment Minister Elliot Morley forecasted. "There is a theory that because of the change, the champagne grape is moving north and so the best climatic conditions for the champagne grape will move to the south of England and our wine sector is expanding and is likely to benefit," he said. (The Journal [Newcastle], 10th February 2005)



Gales cause massive disruption

Severe gales, reaching 90 m.p.h. in late January 2002, left thousands of homes and businesses in the UK without electricity, caused disruption to transport services and damage to buildings, and cost the UK £150 million, according to research undertaken by the Met Office. (Met Office, 3rd April 2002)

Trapped underground

On one day in July 2003, 4,000 passengers were trapped on London Underground in broken down trains for at least 90 minutes, and subjected to combined temperatures and humidity approaching 40°C. Ten people were taken to hospital suffering from heat exhaustion and 627 were treated at the scene. (The changing climate: impact on the Department for Transport, 2003)

Claims for flood damage double

A study undertaken by the Association of British Insurers found that claims for storm and flood damages in the UK have doubled to over £6bn over the period 1998-2003, compared with the previous five years, with the prospect of a further tripling by 2050. The report also warned that by 2050, in a year of extreme weather, massive inland flooding could cost £4.5bn a year, rising to as much as £40bn if London was hit. (Investors Chronicle, 22nd December 2004)



Weather affects retail

Weather affected retail performances in February 2005. Food and drink sales improved overall from a flat January as wintry weather forecasts boosted demand as people stocked up, but sales then slowed when the weather hit. DIY and gardening sales were sluggish, with seasonal lines hit by the weather, though freezing temperatures did help plumbing and heating. Garden care and horticulture were quiet, with new spring ranges hit by the cold weather. Mail order sales were generally flat, with the wintry weather contributing to a slow start to new spring/summer fashion catalogues. (The Retail Bulletin, 8th March 2005)

Flash floods hit traders

Traders estimate that the recent flooding has cost them £500,000 in damage, clean-up costs and lost business after up to 60 town centre shops, offices and pubs were hit by two flash floods within a fortnight. (Leicester Mercury, 3rd September 2004)



Image courtesy of Carlisle News & Star

Temperatures and sales soar

High Street sales surged in June 2003 as shoppers stocked up on booze and barbecues amid soaring temperatures. Sales rose 3% on a like-for-like basis, stripping out new stores, and 5.7% in total from a year earlier, said the British Retail Consortium. The heatwave fuelled sales of ice cream, barbecue food and alcohol, with clothes and sandals also selling well. (BBC News, 15th July 2003)

Retail industry must consider weather

Independent research by Datamonitor shows the retail industry is missing out on sales in excess of £4.5 billion per year by not incorporating weather into their decision-making process. The weather affects consumer behaviour, which in turn affects what they buy, how much and when. For example, in August 2003, the very hot weather in the first couple of weeks drove strong sales of food and drink, but kept shoppers away from most non-food items. (Datamonitor, May 2003)

These examples are not intended to demonstrate evidence of climate change, but they do show the vulnerability of business to weather events.

Assessing climate impacts

Business Areas Climate Impacts Assessment Tool (BACLIAT)

The UKCIP Business Areas Climate Impacts Assessment Tool (BACLIAT) provides a simple checklist for organisations to assess the potential impacts of climate change on their business.

It recognises that a changing climate affects all business areas, and not just the more obvious ones of product design or service delivery.

The checklist can be used at the level of a single organisation or an entire business sector. It invites consideration of the opportunities as well as the threats from a changing climate, under the following headings:

- **logistics:** vulnerability of supply chain, utilities and transport infrastructure
- **finance:** implications for investment, insurance and stakeholder reputation
- **markets:** changing demand for goods and services.
- **process:** impacts on production processes and service delivery
- **people:** implications for workforce, customers and changing lifestyles
- **premises:** impacts on building design, construction, maintenance and facilities management
- **management implications.**

The basis of all climate change impacts assessment is to consider the expected changes to the climate and ask the question "What will this do to my sector or business?". Using your own knowledge, or that of other specialists, you can then suggest what will be the likely 'threats' and 'opportunities' of different climatic conditions. In speculating about future impacts it is useful to start by considering how weather currently affects your operations, and those of your competitors and sector.

BACLIAT has been used successfully in CCFB workshops. These initial impacts assessments can form part of the first tier of the risk-based approach to decision-making which UKCIP recommends. It will be important to keep a record of the assessment process so that it can be re-

visited and reviewed as part of a robust risk assessment process. The assessments for generic impacts on all sectors are summarised on the following pages and assessments for each of the pilot project sectors are summarised in the section 'Climate impacts by sector' (p16).

Before you can begin your BACLIAT assessment you will need to define the context for your enquiry. Where is your business or project located? What time periods are relevant? What will your business sector look like in your chosen period? Simple answers are required to these and similar questions before you can proceed. The following headings indicate those contextual aspects which will affect your assessment. It is important to specify these before you proceed. More detailed notes can be found on the UKCIP website: www.ukcip.org.uk.

The context is defined under these seven headings.

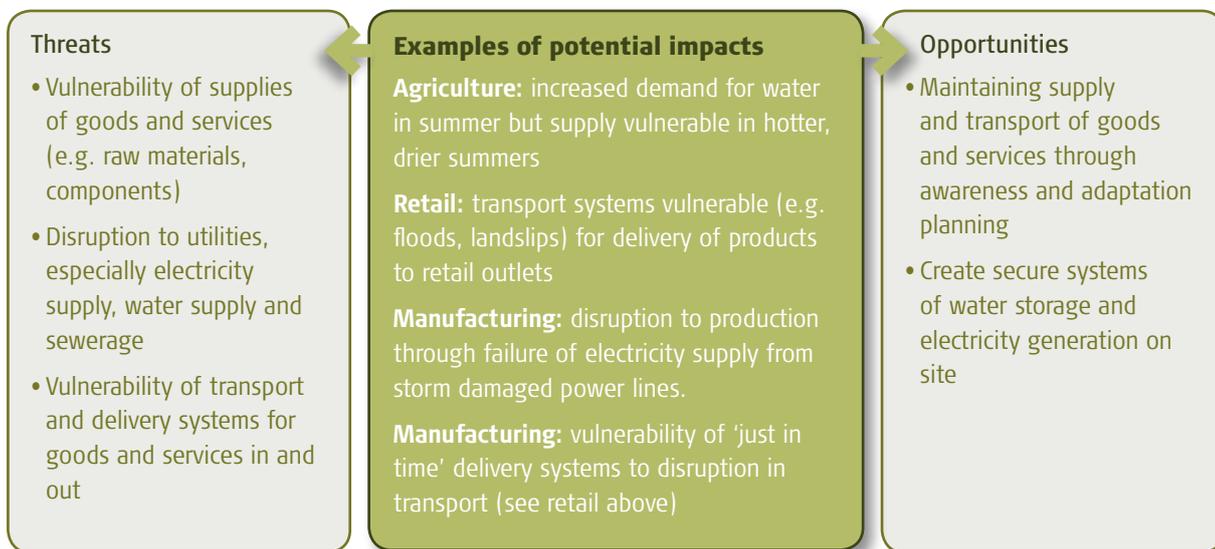
- **Time:** over what time period are you interested in the climate impacts?
- **Location:** where are you interested in finding out about climate change impacts?
- **Greenhouse gas emissions:** how should you take account of different projections for greenhouse gas emissions?
- **Sector:** which sector(s) are you considering?
- **Socio-economic scenarios:** what will the UK and your sector look like in the time period you are considering?
- **Business areas:** which business areas within your organisation are at greatest risk?
- **Climate variables:** which are the important climate variables when considering climate impacts?

The full guidance on a risk-based approach to decision making is contained in the Environment Agency & UKCIP report: Willows, R.I. and Connell, R.K., (2003) Climate Adaptation: Risk, uncertainty and decision-making, UKCIP Technical Report, UKCIP, Oxford. Business organisations are encouraged to make use of this approach, particularly where long-term planning or investment is involved. See also the section on 'UKCIP Tools and Resources' (p32) for more information.

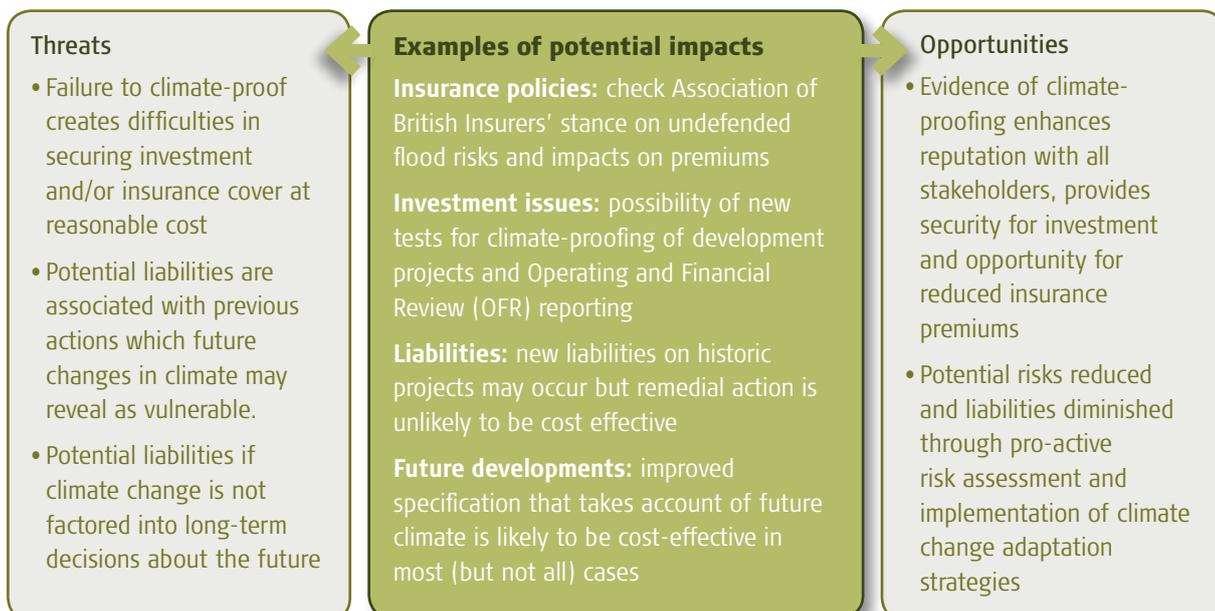
Some threats and opportunities for all sectors arising from a changing climate

The table below shows the outcomes of the BACLIAT checklist applied to all business sectors. These are just a few examples of typical impacts - they are not to be treated as definitive nor comprehensive assessments of the climate risks for business.

Logistics: vulnerability of supply chain, utilities and transport infrastructure



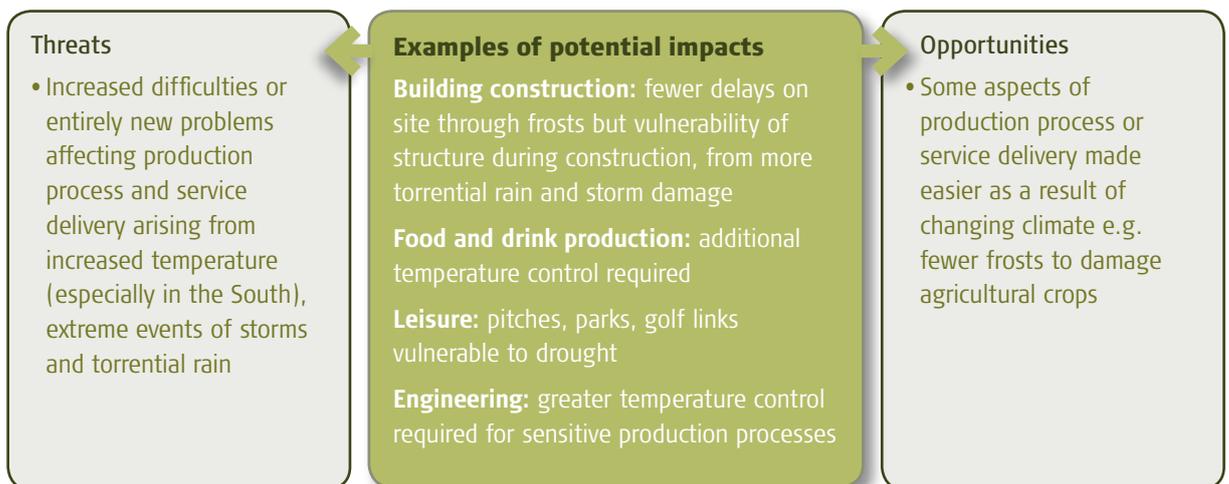
Finance: implications for investments, insurance and stakeholder reputation



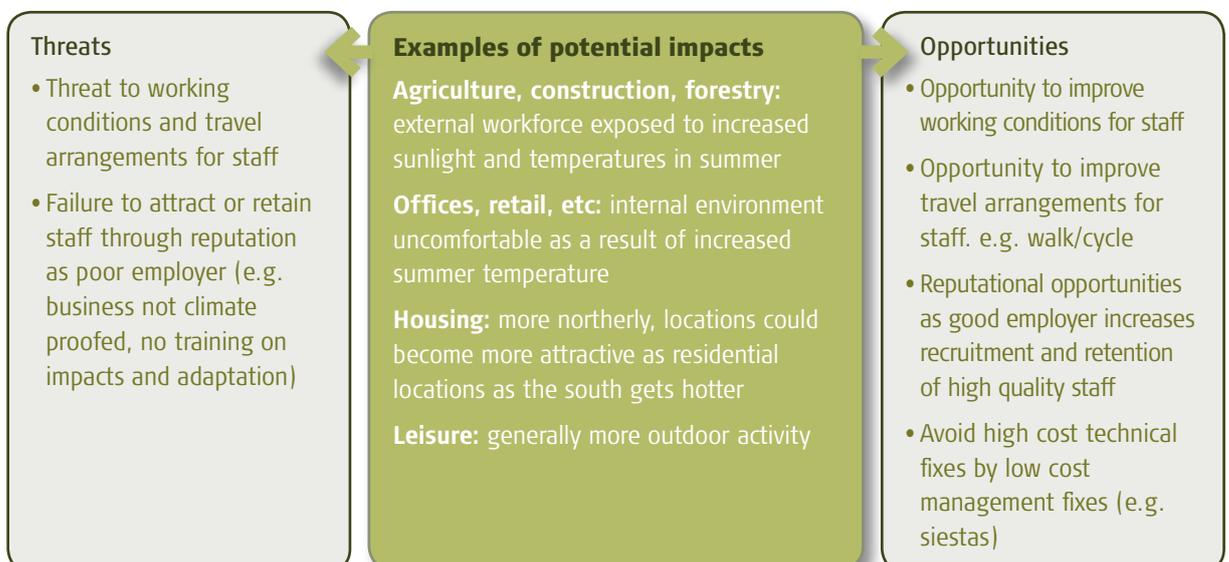
Markets: changing demand for goods and services



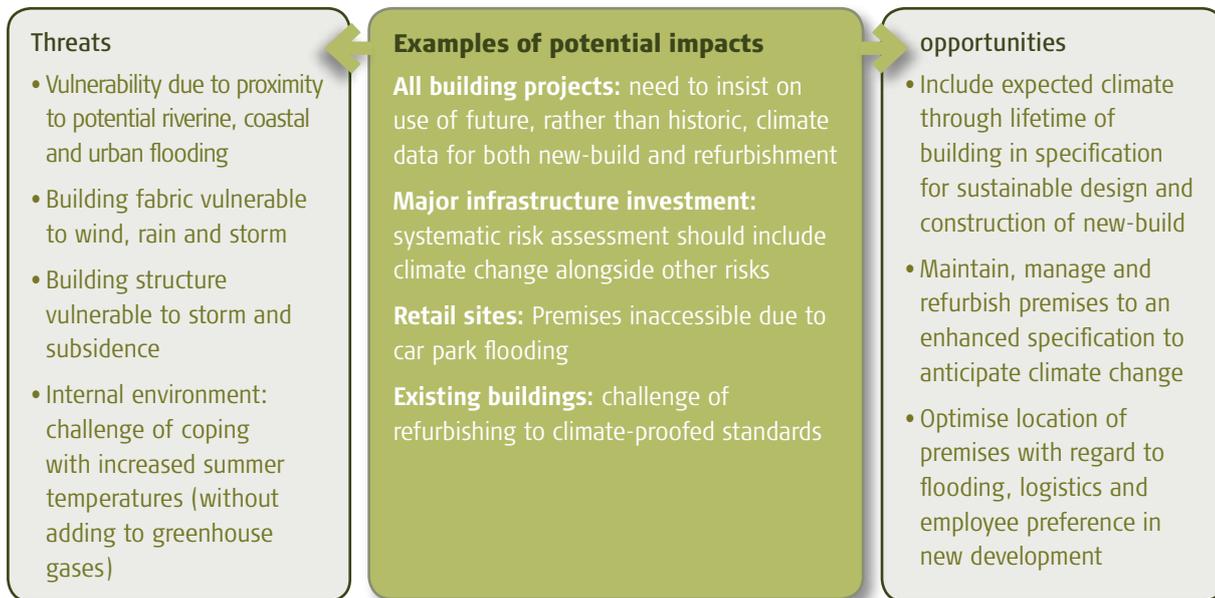
Process: impacts on production processes and service delivery



People: implications for workforce, customers and changing lifestyles



Premises: impacts on building design, construction, maintenance and facilities management



Management implications



"I would like to see UKCIP pro-actively develop links between different organisations in the pilot study, not just within a sector, but between sectors."

Sebastian Catovsky, Policy Advisor, Association of British Insurers

Did you know?

The 1990s was, globally, the warmest decade in the last 100 years. (Climate Change Scenarios for the UK – the UKCIP02 Briefing Report, UKCIP, April 2002)

Climate impacts by sector: agriculture

The table below shows the outcomes of the BACLIAT checklist applied to businesses in the agriculture sector. These are edited highlights from a CCFB workshop using the BACLIAT checklist - they are not to be treated as definitive nor comprehensive assessments of the climate risks for this sector.

Logistics: vulnerability of supply chain, utilities and transport infrastructure

Threats

- More refrigerated distribution and storage required and problems with livestock transportation in summer heat conditions
- Floods, landslips etc disrupting transport infrastructure in short and long term, creating problems with raw materials in and goods out
- Limited availability of water (Section 57 of Water Resources Act restricts agricultural use of water) and potential interruption of supply (and/or cost increase) to irrigation systems in glasshouses and poly-tunnels

Opportunities

- Supplying local markets either in UK generally or very locally, provides for local sourcing and regional distinctiveness offering a new marketing approach with reduced food miles
- On-site processing to supply local markets and add value
- Build relationships with water companies for farmers to provide water storage facility on their land and provide on-site water storage generally

Finance: implications for investment, insurance and stakeholder reputation

Threats

- Investment in equipment ties farmer into the relevant crop until capital is paid off, so difficult to change crops
- Agriculture perceived as a poor industry in which to invest as it is vulnerable to climate change
- Investment may not be available to respond to impacts of changing climate e.g. hardstanding around buildings to deal with winter mud

Opportunities

- Consider risks and opportunities of climate change within (say) a 5 year business plan
- Evidence of climate proofing business improves reputation with investors, insurers and other stakeholders and may liberate investment funding

Markets: changing demand for goods and services

Threats

- Loss of traditional markets, loss of local competitive advantage, and new competition in existing markets e.g. as a result of global climate change
- Quality issues relating to climate e.g. overheating of grain, and supermarkets demanding washed produce – which is very water intensive
- Maintaining a supply to markets

Opportunities

- UK can compete with other countries by growing new products that need a warmer climate
- Changing customer demand in response to climate (more salads and fresh fruits)
- Diversification into new areas e.g. tourism, biomass, renewables, manufacturing (hemp)

Process: impacts on production processes and service delivery**Threats**

- Existing crops may no longer be viable in new climate conditions
- Problems of access to land especially in flood or torrential rain conditions
- Less frequent frosts will affect quality of certain crops, reduce soil conditioning and reduce kill-off of pests and diseases.
- Water quality reduced in summer

Opportunities

- New species and varieties of plants can be grown: e.g. English vineyards for English wines and new types of livestock e.g. buffalo for English mozzarella.
- Crops for renewable energy and transport fuel
- Better growing conditions [higher temperatures and increased carbon dioxide (CO₂)] for existing crops will increase productivity

People: implications for workforce, customers and changing lifestyles**Threats**

- Difficult to respond to increased demand for staff leading to staff shortages or unskilled staff
- Staff need training in new skills associated with new crops, new technologies and new approaches to land management
- Exposure of workforce to increased sun and skin cancer risk

Opportunities

- Possible increased local employment opportunities arising from new crops, livestock, etc
- Provide staff training to respond to diversification of employment patterns, new crops, technologies, land management, etc

Premises: impacts on building design, construction, maintenance and facilities management**Threats**

- Farm buildings vulnerable to extremes of wind, summer heat, driving rain. A particular concern for animal welfare (eg summer shade for pigs)
- Curtilages to buildings vulnerable to extreme downpours of rain, flash flooding and increased run-off and erosion
- Existing buildings not adapted to new climate, especially in hot summer conditions

Opportunities

- Generally milder winters requiring less winter housing for livestock
- Farmers diversifying can convert existing buildings to other uses, (e.g. residential accommodation and tourist information/education centres), designed to take account of future climates
- Threat to existing buildings provides an opportunity to create climate-proofed new buildings

Management implications**Threats**

- Diversification generally including cultivation of new crops could mean that farmers are moving into areas in which they have no experience and are therefore more vulnerable
- Risk of reactive adaptation rather than adaptation responses based on long-term planning
- More outsourcing and use of contractors could mean that farmers are less flexible and more reliant on contractors

Opportunities

- Consider risks and opportunities of climate change within (say) a 5-year business plan
- Staff development – training and education could include overseas trips to other farms that are growing crops that UK will be able to grow in new climatic conditions

Climate impacts by sector: building design and construction

The table below shows the outcomes of the BACLIAT checklist applied to businesses in the building design and construction sector. These are edited highlights from a CCFB workshop using the BACLIAT checklist - they are not to be treated as definitive nor comprehensive assessments of the climate risks for this sector.

Logistics: vulnerability of supply chain, utilities and transport infrastructure

Threats

- Flooding, especially flash flooding, will disrupt transport for site deliveries
- Site work more difficult therefore more prefabrication – therefore longer delivery lines for materials/ components which will be vulnerable to extreme events, and generate more CO₂ emissions
- Utilities generally (energy distribution, drainage infrastructure) vulnerable to extreme weather events

Opportunities

- Specify building solutions where production is close to point of use, including pre-fabricated buildings and components
- Use local sourcing to reduce 'travel miles' and vulnerability to transport disruption
- Opportunities for timber production (more CO₂ helps growth) for use where 'lightweight construction' is appropriate

Finance: implications for investment, insurance and stakeholder reputation

Threats

- Construction industry needs clarification of design standards in the face of changing climate and performance indicators of well-adapted buildings
- Implications for insurance (of buildings, professional indemnity, employers liability) for existing buildings, new buildings and during the construction process

Opportunities

- Clients attracted to designers and contractors with evidence of climate future-proofing in building projects
- Good risk management will appeal to financiers and insurers and provides opportunity to market risk management expertise
- Good reputation attracts good staff, customers, and investors

Markets: changing demand for goods and services

Threats

- Building fabric generally vulnerable to increased temperatures, driving rain and other extreme events.
- Could NHBC 10-year guarantee period need extending?
- Existing buildings not well-adapted to new climate, especially in hot summer conditions, leading to reduced value of existing buildings if they are not future climate-proofed

Opportunities

- Opportunities for concrete in situations where high thermal mass is appropriate, especially by recycling waste materials from other industries, thereby reducing use of virgin materials
- Specify flood-resistant solutions in vulnerable locations

Process: impacts on production process and service delivery**Threats**

- Excessive heat in summer will affect on-site construction processes
- Need to damp down on-site dust in dry summer conditions
- Extreme rainfall events make muddy site conditions and restrict on-site days.
- Partly-completed structures more vulnerable to wind and storm damage

Opportunities

- Fewer frosts reducing interruptions to on-site processes
- Developing expertise and technology in water management and drainage
- Developing expertise in the design of well-adapted buildings
- Developing expertise in managing construction processes in response to climate change

People: implications for workforce, customers and changing lifestyles**Threats**

- Extreme discomfort in summertime in all building types, especially in the south
- On-site workforce exposed to increased UV and temperatures
- Dissatisfied occupants of buildings that are not fit for purpose: e.g. building occupiers experiencing flooding, inadequate drainage, lack of solar control and cooling, problems with air tightness, driving rain and winds

Opportunities

- Greater comfort and lower fuel bills in winter
- Training staff on climate change issues – including design, on-site activities etc (applies at lots of levels, degree, HND, individual trades)
- Some locations, currently not popular because of poor weather, will become more attractive as the climate changes

Premises: impacts on building design, construction and facilities management**Threats**

- Risk of flooding to properties and building sites
- Provision of cooling through installation of air-conditioning will increase capital cost, running costs and emissions of greenhouse gases
- Poor working conditions on site including in site huts particularly in higher summer temperatures

Opportunities

- Clients will require increased maintenance of existing buildings
- Opportunities for high thermal mass building solutions which can reduce air-conditioning requirements
- Opportunity to develop expertise and reputation in climate-related building issues

Management implications**Threats**

- Danger of ignoring climate change issues altogether
- Danger of over-reacting to climate change issues
- Unforeseen or unplanned-for regulations
- Ultimately business failure

Opportunities

- Putting climate change into management and planning systems thus climate future-proofing business and buildings
- Make full use of climate scenarios and other weather prediction services
- Influence regulations, especially Building Regulations, through trade and professional bodies and other stakeholders

Climate impacts by sector: motor manufacturing

The table below shows the outcomes of the BACLIAT checklist applied to businesses in the motor manufacturing sector. These are edited highlights from a CCFB workshop using the BACLIAT checklist - they are not to be treated as definitive nor comprehensive assessments of the climate risks for this sector.

Logistics: vulnerability of supply chain, utilities and transport infrastructure

Threats

- Significant supply chain interruptions to intensive production schedules, and resultant cost implications
- Vulnerable transport systems, on which global supply chain depends, carrying high value products around the world (e.g. one ship carries £30million worth of product)

Finance: implications for investment, insurance and stakeholder reputation

Threats

- Failure to climate-proof company, product range, premises etc will increase potential for legal action, increase insurance premiums and reduce confidence amongst investors

Opportunities

- Demonstrating that climate risks are integrated into business planning improves reputation with investors, insurers, and other stakeholders

Markets: changing demand for goods and services

Threats

- Increasing globalisation of markets may require products to operate in even wider range of climates, but many cars already designed to operate in harsher climates
- Vehicles to tolerate new extremes of climate, including greater intensity of rainfall (affecting seals, tolerances, wipers, tyres) and increased need for cooling

Opportunities

- Globalisation of markets may permit a 'one size fits all' specification for a wide range of climates.
- Design and produce low-energy technologies for cooling interior of vehicles
- Include new technology in vehicles to warn drivers of weather-related hazards
- Increased demand for (summer) recreational vehicles

Process: impacts on production processes and service delivery**Threats**

- Process environment will become hotter with increased need for cooling of some sort
- Increased drying time for painted products as a result of increased humidity

People: implications for workforce customers and changing lifestyles**Threats**

- Possible introduction of regulation on maximum working temperature in process environment
- Health hazards arising from excessive heat and respiratory problems and possible increased absenteeism

Opportunities

- Changing holiday patterns of workforce with more even distribution throughout the year will aid continuous production.
- Staff training including learning from operation of plant in other climates similar to those which are expected for UK

Premises: impacts on building design, construction, maintenance and facilities management**Threats**

- Buildings generally vulnerable to extremes of wind, summer heat, driving rain etc particularly addressing comfort conditions for workforce and performance conditions for production processes
- Existing buildings difficult to adapt to new climatic conditions

Opportunities

- Lower heating costs in winter
- Design new buildings in anticipation of changed climate

Management implications**Threats**

- Perceived lack of suitable data on future climate as a basis for quantified decision making
- Review vulnerability of supply chain and logistics, particularly extreme events, as these seem to be priority areas
- Some product components and testing regimes may need adaptation to cope with climate change

Opportunities

- Processes may be influenced by climate change but global experience will help the industry to adapt
- Demonstrating that climate risks are integrated into business planning improves reputation with investors, insurers, and other stakeholders

Climate impacts by sector:

Financial services

The table below shows the outcomes of the BACLIAT checklist applied to businesses in the financial services sector. These are edited highlights from a CCFB workshop using the BACLIAT checklist - they are not to be treated as definitive nor comprehensive assessments of the climate risks for this sector.

Logistics: vulnerability of supply chain, utilities and transport infrastructure

Threats

- Prolonged periods of poor weather make it harder for insurers to deal with high volumes of claims
- Insurers' and lenders' operations (inc. IT systems) could be vulnerable to impacts of stormy conditions, unpredictable electricity supply etc

Opportunities

- More weather-related claims improves efficiencies per claim
- Specialised claims handlers for climate-sensitive claims

Finance: implications for investment, insurance and stakeholder reputation

Threats

- Ignoring climate change may appear to give a better return on investment
- Over reaction or no action to possible risks
- Reach limits of capacity of global financial markets to absorb risk. Currently global reinsurance capacity is \$100bn, and Munich Re suggests that cost of weather-related disasters will exceed \$150bn by 2010 due to climate change

Opportunities

- Greater need for risk-transfer mechanisms
- Policies based on rigorous risk assessment
- Alternative Risk Transfer mechanisms could be developed through other parts of financial sector – e.g. catastrophe bonds and weather derivatives

Markets: changing demand for goods and services

Threats

- Negative impact on reputation if property insurance cannot be provided in areas of increasing risk, e.g. high flood risk, high subsidence risk
- Reduced market for insurers and lenders in climate-sensitive locations/sectors

Opportunities

- Insurance market could provide products to deal with increasing proportion of higher-risk locations/sectors
- Evidence of future-proofing could be included within the new requirement for a 'Sellers' Pack' for the sale of domestic property
- Pro-active stance on dealing with climate change could enhance reputation of financial sector

Process: impacts on production processes and service delivery**Threats**

- High volume of claims becomes unmanageable
- Underwriting more difficult as traditionally it is based on historic information of previous patterns of claims

Opportunities

- Sophisticated underwriting that takes account of climate change
- Greater capacity within workforce of climate-related issues for underwriting

People: implications for workforce, customers and changing lifestyles**Threats**

- Workforce experiencing difficulty getting to work in extreme weather conditions
- Individual householders may not understand or respond to potential impacts of climate change
- Dissatisfied customers/occupants with 'buildings that are not fit for purpose': e.g. experiencing flooding, inadequate drainage, lack of solar control and cooling, problems with air tightness, driving rain and winds

Opportunities

- Be a good employer by preparing well for climate change
- Lower fuel bills and reduced CO₂ emissions as buildings don't need as much heating in milder winters
- Householders anticipate changing climate in making purchasing decisions based on property location and preparedness for changing climate

Premises: impacts on building design, construction, maintenance and facilities management**Threats**

- Climate damage to building fabric and structure including mould, subsidence, wind and flood damage
- Pest damage to buildings e.g. termites overwintering in mild winters

Opportunities

- Opportunity to establish a reputation by setting good examples of climate change adaptation
- Exploit external spaces

Management implications**Threats**

- Business failure as cannot price risk correctly OR cannot handle all the claims OR cannot maintain sufficient financial capacity
- Unforeseen or unplanned for regulation
- Reactive rather than pro-active approach gives sector a bad reputation on weather risk issues

Opportunities

- To become a source of expertise on weather damage issues
- Putting climate risks into management systems
- Financial services to take a central role in society by communicating risks of one of biggest environmental challenges we face

Building capacity to adapt to climate risks

For all

Be clever with the language of climate change

It is not surprising that perceptions of climate change are strongly influenced by the language that we use to describe it. Even the words 'climate change' themselves appear to be a big turn off for many. In a similar way organisations are able to dismiss as unimportant impacts that are predicted to occur much later in this century, which is how most climate change scenarios are presented. Introducing these issues through a discussion of current 'weather-related risks' overcomes some of these perceptions. It invites organisations to consider their exposure and vulnerability to current weather events as a stepping-stone to consideration of future, potentially more severe, impacts as the climate changes. Using the language of risk also invites businesses to treat climate change alongside other business risks, through formal risk assessment.

Pursue 'building adaptive capacity' as well as 'delivering adaptation action'

One of the important lessons from the CCFB pilot is the recognition of the difference between 'building adaptive capacity' and 'delivering adaptation action'.

Building adaptive capacity is the putting in place all of the support systems, legislative and policy framework(s) which will encourage, allow or require individual businesses to undertake adaptation. Measures will use both 'carrot' and 'stick' and will include activities such as: awareness raising; research; staff development and training; putting in place regulation, codes, standards, policies and fiscal incentives and investigating alternative adaptation options. Only when such work has been undertaken in a particular organisation or sector can the work of delivering adaptation actions can begin.

Delivering adaptation action involves putting in place physical or managerial arrangements that respond to the opportunities or threats presented by the changing climate. These might include such actions as: re-locating a business to avoid the risk of flooding; establishing a siesta lunchtime break to avoid having to work through the excesses of summer temperatures; or planting new crops which can be grown in hotter, drier summers.



Delivering adaptation action is the role of individual businesses, and of other organisations such as local authorities. Helping to build adaptive capacity is the role of trade associations and professional bodies, as well as government departments and UKCIP. So, there are issues which sit outside the influence of an individual business but for which it may be appropriate to help to build capacity through influencing policy, legislation etc, probably in co-operation with others (e.g. through trade associations).

Aspire to 'mainstreaming' climate change risks into normal business management and procedures

We believe that the most effective responses to a changing climate can be achieved where climate risks are managed as part of normal business decision-making: mainstreaming. This should be a long-term aim for all organisations. However, in moving towards this goal it is usually necessary to identify and work on climate risks as a discrete activity in the first instance, until there is greater recognition and understanding of the issue within the organisation.

For individual businesses

There are opportunities as well as threats presented by climate change

Businesses increasingly accept that the climate is changing and many are addressing the challenge of reducing carbon emissions. However successful our work to reduce emissions, the UK climate will still see significant changes over this century. These changes present businesses with opportunities as well as threats. For example, positive opportunities arise out of changing markets or demand for new products and services, and being an 'early-mover' to deal with either threats or opportunities can yield significant commercial advantage.

The effects of a changing climate are usually specific to a sector, business area, or locality

Although it is possible to provide some general guidance on the impacts on business it is only through making a formal assessment that takes account, for example, of location, time, business area or climate variable that a clear understanding of impacts can be obtained.



UKCIP tools help to define climate impacts and adaptation strategies for business and business sectors

UKCIP cannot provide detailed sets of impacts for each sector or location, though there is a wealth of resources, regional and sectoral studies to assist. Individual businesses are best placed to assess the potential impacts on their own activities and it is easier, now that UKCIP tools are available, for individual businesses to make their own risk assessments. The BACLIAT checklist is a good place to start. UKCIP's Adaptation Wizard provides a simple framework to work through within which other specialist tools are nested (e.g. *Risk, uncertainty and decision-making* and *Costing the impacts of climate change*). More information on these tools is to be found on UKCIP's website www.ukcip.org.uk and in the section on 'UKCIP Tools and Resources' (p32).

Did you know?

The last ten years has seen nine of the ten warmest years (globally) on record, with only 1996 not making the top ten. (Met Office, 16 December 2004)

Appoint a climate risks champion

A business appears to achieve little on impacts and adaptation until someone is made responsible for this area of work. This is not necessarily an 'environmental' appointment, as climate impacts affect all business areas, and skills or knowledge on climate science are not a pre-requisite: support from the board or senior management team is. This provides authority to the post-holder and a reporting mechanism back to the senior management team.

For trade associations and professional bodies

Significant role in capacity building for members

Trade and professional bodies can be efficient and effective in engaging their members with the concepts and practice of adapting to a changing climate. This can include awareness raising, commissioning research, providing staff development and training and providing guidance through publications. Most important in all of this is placing climate change adaptation on the agenda for members within their association or institutions. We recognise that some trade associations and professional institutions will have resource limitations which may constrain this work. On the other hand, such organisations can be seen to add value for their members by introducing them to UKCIP for access to its tools and, potentially, support for individual businesses.

"We need to build awareness of the potential impact of climate change amongst our members at a time when they have a huge number of regulatory issues to deal with"

Jackie Bennett, Senior Policy Advisor, Council of Mortgage Lenders

Identify areas where government and others can develop codes, standards, and policies

Many trade and professional bodies have good links with central government and other strategic organisations. These links can be informed by a programme of workshops with members, to identify those areas where lobbying central government and others can influence the setting of policy, changing regulations or other capacity building activity.

Climate risks champion

Neither trade bodies nor professional institutes can make much progress without someone being given the responsibility for developing this area of work. CCFB pilot project partners have adopted a variety of approaches, but, perhaps predictably, most success has been achieved where an officer (rather than a member) has been appointed and where support has been forthcoming from a senior level.

Different types of membership

An important difference between trade bodies and professional institutions is that in trade bodies the membership consists of companies, whereas in professional institutions the membership consists of individuals. So, trade bodies seem to have greater potential for influencing key players, particularly where the membership consists largely of a few, big companies. It is relatively easy for such trade associations to organise events that will engage a majority of businesses in their sector, or at least those businesses that represent key players in their industry. By contrast professional institutions have a very large number of individual members with whom it is more difficult to engage through meetings or seminars but they do play a significant role in education, continuing professional development and the setting of professional standards.

“The issue is now firmly in the consciousness of the Sustainable Futures Committee and it is evident that the issue of adaptation is being raised more and more as a significant component of any discussion about the sustainability of development.”

*Bill Gething, President's Advisor on Sustainability,
Royal Institute of British Architects*

Did you know?

Average precipitation for all of England and Wales in 2000 was the highest it has been in the last 30 years. (Environment Agency website, www.environment-agency.gov.uk, retrieved 31 May 2005)



For central government

Build adaptive capacity by developing standards, regulations and policies

Both 'carrots' and 'sticks' are useful in promoting adaptation. UKCIP is not aware of any significant 'carrots' to encourage adaptation. In support of mitigation, however, there are a range of incentives to encourage take-up of energy efficient products, such as star ratings for white goods and lower rate VAT for insulation. There may be scope for similar initiatives to stimulate adaptation action. The government can provide the 'stick' that will generate action, by explicitly including climate change in policies and regulations, for example through building regulations that require designers to consider and respond to the future climate.

Include a role for UK businesses in the proposed Adaptation Policy Framework

The government will launch the first stage of an Adaptation Policy Framework (APF) in 2005, which will draw together adaptation policies and activities across government. Businesses and business support organisations, including trade and professional bodies, can play a significant role in delivering actions identified within this framework, and could be involved in designing the APF in the first place.

Review of CCFB pilot project 2004

The Changing Climate for Business (CCFB) programme began in early 2004 with a pilot project involving selected trade associations and professional bodies.

Businesses are increasingly involved in the climate change debate, particularly through their contribution to the mitigation of climate change by reducing greenhouse gas emissions. Although some previous UKCIP projects had involved businesses there had been no systematic engagement with the wider business community. In response to government's lead to work with business on adaptation to climate change, UKCIP set up the CCFB pilot project as the first stage in a strategy for engaging UK business.

The project plan

Aims

The project plan proposed working with 5-10 partners drawn from trade associations and professional bodies who would form the project team. Partners would then be briefed and supported by UKCIP to develop capacity building programmes within their own organisations and membership. The lessons learned from this process would be reviewed at the end of a year. This would provide, for the first time, robust information on impacts and adaptation for businesses and would inform future UKCIP work with the business community. In addition the pilot would encourage business organisations to use, and help to develop, UKCIP tools and create networks within and between business sectors.

Project partners

Trade and professional bodies were chosen as the initial group of partners as they provided access to a large number of businesses. The initial group of partners fell into four clusters, representing several important strands of the UK economy. These were:

- agriculture (Country Land and Business Association [CLA], National Farmers' Union [NFU]);
- building design and construction (Chartered Institution of Building Services Engineers [CIBSE], The Concrete Centre [CC], Royal Institute of British Architects [RIBA]) ;
- motor manufacturing (Society of Motor Manufacturers and Traders [SMMT]);
- financial services (Association of British Insurers [ABI], Council of Mortgage Lenders [CML]).

Climate risks champions

Critical to the pilot project was the identification of 'climate risks champions' within each of our partner organisations. In some cases the responsibility for dealing with climate change adaptation arose naturally from an individual's job description. In others it became an extension of a 'sustainability' or Corporate Social Responsibility role, and for others it was just new! Whatever the reasons for these appointments the successful running of the pilot project has been entirely dependent on the commitment of these champions and their willingness to engage colleagues within their organisations and their wider membership.

UKCIP events

UKCIP ran a series of briefing events and progress meetings to assist partners. The briefing events covered topics including: introduction to climate science; climate scenarios for the UK in the 21st century; introduction to UKCIP tools; capacity building techniques; and workshops using the BACLIAT checklist. Progress meetings provided a real opportunity for partners to discuss issues which seemed surprisingly common to all, despite the wide range of sectors represented.

Develop project plans for individual trade and professional bodies

Partners were invited to prepare project plans for their own organisation. Plans included: senior management buy-in; research; national events for staff; national events for members; events for members of regional branches; publications and articles in trade and professional journals; and strategic climate adaptation plans.

Project outcomes

The approaches to building capacity were understandably determined by the structure of each organisation, particularly the relationship between the parent organisation and its individual members. The different outcomes are reported below.

Climate risks champions

Differences were also reflected in the way that each organisation identified an adaptation champion to lead involvement in the CCFB pilot project. Whilst some organisations were dependent upon voluntary input from members, others were able to accommodate the work within an existing manager's function. The champions

provided a focus for climate risks activities within their organisations in external networks.

Awareness raising

Champions participated in a series of UKCIP events, which introduced the concepts and principles of climate change, the UKCIP02 climate change scenarios, approaches for the assessment of impacts, and the tools available for undertaking risk assessment, cost appraisal and developing adaptation strategies. In some cases, these events led on to champions using this information to generate further activity within their organisation. Initial clarification was needed to distinguish between mitigation actions, where many were already active, and the need for assessing vulnerability to climate change and how to adapt. However, once this was established, an understanding of impacts for each sector was quickly developed, and participants were able to explore how best to build capacity within organisations and to develop initial adaptation responses. Participants were also willing to engage with climate change impacts in other sectors, and learning was derived from cross-sectoral discussion and debate.

Informing members

The types of members in each trade association or professional body varied considerably. ABI, CML and SMMT have many large companies in membership, whilst the professional institutes (CIBSE, RIBA) tend to represent individual members. This affected the approaches adopted in seeking to build capacity for climate change adaptation amongst members and their businesses.

Presentations to regional branches were the main strategy adopted by CIBSE and RIBA. Both organisations already had an established programme of events for regional branches in England and Wales which also contributed to formal recognition of Continuing Professional Development for members. UKCIP spoke at a series of CIBSE events in England, Scotland and Wales, addressing climate scenarios, impacts and UKCIP tools. RIBA began with a more substantial event in its London Region, associated with the London Climate Change Partnership. This proved to be very successful, involving several speakers and with more than 80 people attending. It will be offered as a model for events for other RIBA regions.

The ABI commissioned an independent piece of *research* to scope the impacts of a changing climate for the UK insurance industry and to suggest appropriate responses for the ABI, its member companies and the UK government¹. The research findings were the subject

of a formal launch and workshop for ABI members. This ensured that the report achieved a high degree of visibility within the industry as well as wide publicity (in the UK and internationally) for the issues it raised. CIBSE was already engaged in research on climate change and the internal environment of buildings which was then used to develop a new CIBSE technical memorandum². This is particularly significant as CIBSE technical memoranda are referred to in codes and regulations, for example in building regulations, and therefore set the standard across whole of the construction industry.

Other *publications* took a variety of forms but were mainly targeted by trade bodies at their own members. The CLA was in some respects ahead of the other CCFB participants, as it had already produced a publication³, which addressed both mitigation and adaptation aspects of climate change and also made recommendations to central government. The NFU produced two articles for in-house journals^{4 5} and began preparation of a more substantial policy document which will highlight climate impacts upon the different crops and livestock in UK farming, for publication in 2005. The CC produced an article for in its in-house journal and in 2005 began compiling a policy document, which makes use of the UKCIP02 climate change scenarios.

CML and SMMT both ran *workshop events for members*, to brief them on climate changes and to work with them to identify the range of potential implications for their business, with UKCIP providing technical and facilitation support. The SMMT event was held in conjunction with the EEF (EEF is the organisation for manufacturing, engineering and technology-based businesses). ABI worked with the Met Office to organise an event for insurers to help them to understand how to factor climate change scenarios into their business operations.

There was also some progress in linking CCFB pilot project participants with regional climate change partnerships (see section on Resources, p32). Thus, SMMT joined Sustainability West Midlands, where it is heading a project on sustainable mobility. ABI member companies also became involved in regionally-focussed work, for example Ecclesiastical joined the South West Climate Change Impacts Partnership. UKCIP is working with the emerging climate change partnerships in Northern Ireland and Scotland to ensure that pilot project participants with a presence in these areas can play a role in the development of these partnerships.

The pilot project has provided a strong foundation on which to build future work.

¹A Changing Climate for Insurance – a summary report for chief executives and policy makers, Association of British Insurers, June 2004. www.abi.org.uk/climatechange

²Climate change and the indoor environment: impacts and adaptation, TM36:2005, Chartered Institution of Building Services Engineers, February 2005

³Climate Change and the Rural Economy, Country Land and Business Association, 2001 ⁴British Farmer and Grower, South East Edition, April 2004, Issue 18, NFU

⁵NFUPro Journal, June 2004, NFU

Pilot project partners

The Association of British Insurers

(ABI) is the trade association for insurance companies operating in the UK. It represents over 400 members who, between them, transact around 95% of UK insurance business. It is estimated that the insurance industry accounts for 20% of investment in the stock market.

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The Chartered Institution of Building Services Engineers

(CIBSE) is an international body which represents and provides services to the building services profession. It undertakes a wide range of learned society activities ranging from information services and acknowledged industry good practice publications in its series of Guides and other publications, to running a wide range of events, and to providing extensive networking activities through a series of regional and special interest groups.

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The Concrete Centre (CC) was formed to ensure that the complexity and flexibility of concrete is communicated as a competitive advantage. The Centre aims to assist all those who design and construct in concrete whether they work for national or local government, client bodies, architectural practices, civil and structural engineering consultancies, main and specialist contractors or housebuilders.

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The Council of Mortgage Lenders

(CML) is the representative trade body for the residential mortgage lending industry. Its 143 members currently hold over 98% of the assets of the UK mortgage market. In addition to lending for home ownership and to the private rented sector, the CML members also lend for new-build, repair and improvement to social housing.

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The Country Land and Business

Association (CLA) was founded almost one hundred years ago to protect the interests of owners of rural land in England and Wales. Today, it campaigns for a thriving rural economy, using the experience and expertise of its membership which encompasses the full diversity of land, property and business.

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The National Farmers' Union (NFU)

represents the farmers and growers of England and Wales. Its central objective is to promote successful and socially responsible agriculture and horticulture, while ensuring the long term viability of

rural communities. It represents around three quarters of the full time commercial farmers of England and Wales.

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The Royal Institute of British

Architects (RIBA) exists to advance architecture and promote excellence in the profession. It does this via a programme of lectures, exhibitions and events; works in schools, community architecture projects and community architecture schemes. The RIBA is a member organisation, with 30,000 members, with an executive of 170 staff at the HQ in central London and in a dozen regional offices.

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The Society of Motor Manufacturers and Traders Limited (SMMT)

exists to provide services and support for the whole industry and reflects its ever changing needs and interests. It provides information, representation and advice to its members including; vehicle manufacturers, importers, suppliers of components, parts and accessories; and consultancies.

Simon Barnes

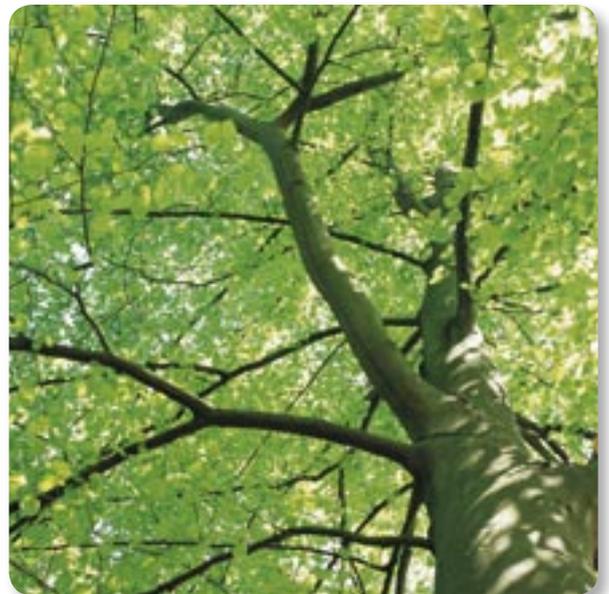
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Future CCFB programme and how to join

This section sets out ideas for our forthcoming UKCIP business programme. If you would like to pursue climate impacts and adaptation issues within your organisation, UKCIP may be able to help. Please contact us with your enquiry, indicating which parts of the programme are of particular interest, at UK Climate Impacts Programme, tel: 01865 285717, e-mail: enquiries@ukcip.org.uk, website: www.ukcip.org.uk

Continuing and new work with trade associations and professional bodies

The pilot project has yielded some good understanding of business issues and the benefits of working with trade associations and professional bodies. The work so far has concentrated on assessing the effects of climate change on a small number of business sectors. The pilot project partners already represent important parts of the economy but additional trade and professional bodies need to be identified for other important sectors. Retail, waste management, environmental health, transport, and leisure have been suggested as possible next priorities. UKCIP would be pleased to receive further suggestions as to what might be considered priority sectors as well as individual enquiries from trade and professional bodies. Continuing work with existing and new partners will focus on equipping them to develop their own adaptation strategies and action plans. For example, through setting up more robust systems for incorporating climate risks into business planning and making fuller use of UKCIP tools.



New work with individual businesses orchestrated through new partnerships

Delivering adaptation action can only take place at the level of individual businesses, which the pilot project has not featured, because it worked with organisations that represent and support businesses, rather than individual businesses themselves. The next stage of CCFB has identified potential partners and programmes to provide opportunities to work directly with individual businesses. These include: Business in the Community; Regional Development Agencies; and Knowledge Transfer Partnerships.

“There is a growing recognition that we will need to provide guidance to members on how to build appropriate climate impacts assessments into their normal design activity.”

Vic Crisp, Consultant, Chartered Institution of Building Services Engineers

Business in the Community (BITC) and its BiE programme

There are excellent opportunities for linking BITC activities with existing climate change partnerships, developing joint work with the BITC Rural Action Programme, participation in BITC events and co-operation on developing the Business in the Environment (BiE) Environment Index to incorporate climate change adaptation. UKCIP and BITC are to sign a Memorandum of Understanding in 2005 for working together over the next few years.

Did you know?

Evidence is emerging that winter rainfall in the UK is becoming heavier, with the most intense daily rainfalls now contributing about twice as much to winter rainfall as in the early 1960s. (Climate Change – the UK Programme, Department for Environment, Food and Rural Affairs, 2001)

Regional Development Agencies (RDAs) in England and their equivalents in Northern Ireland, Scotland and Wales

Organisations responsible for economic development, enterprise and inward investment in the English regions and Northern Ireland, Scotland and Wales already need to factor climate change into their planning. Changing Climate for Business provides one way for these organisations to understand climate adaptation issues as they affect businesses.

Work in this area could include: briefings on business threats and opportunities of climate impacts and their importance to economic development; achieving support for capacity building in one or two nominated priority sectors in each area; identifying appropriate 'climate risks champions' within each organisation to take overall responsibility for linking climate adaptation to economic development; and working to build adaptive capacity within businesses in priority sectors. Preliminary discussions on some of these approaches have already begun between UKCIP and the RDAs.

Knowledge Transfer Partnerships (KTP)

The Knowledge Transfer Partnership scheme supports partnerships between a company, an academic institution, and a graduate who is seeking career and academic development (the KTP Associate). There

is scope for a KTP Associate working in the partner business, under supervision from UKCIP, who could research climate change impacts and adaptation in the context of the business to bring immediate benefits. More information on KTPs can be found at <http://www.ktponline.org.uk/>.

If you would be interested in exploring a KTP project with UKCIP, please contact UKCIP via enquiries@ukcip.org.uk or on 01865 285717.

A Changing Climate for Business forum

The benefits of cross-sectoral working have already been demonstrated in the pilot project. A forum through which all CCFB partners could share learning, hear about relevant research and new initiatives, and build networking opportunities, would be a valuable addition to the CCFB programme for a wide community of businesses and business support organisations.



UKCIP tools and resources

UKCIP has a number of tools to help organisations assess their vulnerability to climate change and to devise appropriate ways to adapt to the changing climate. All UKCIP reports and resources are available free of charge. Reports are available in a variety of formats, including hard copy, CD and as pdfs from the UKCIP website at www.ukcip.org.uk. Hard copies and CD versions can be ordered online or by 'phone on 01865 285717.

Adaptation Wizard

The Adaptation Wizard is a web only tool, designed to help you move through a process from simple understanding of climate change, to integration of climate change into decision-making, by making use of a number of resources – all signposted from the Wizard. Worked examples are on hand to demonstrate its practical application. The Wizard draws heavily on the UKCIP report 'Climate adaptation: Risk, uncertainty and decision-making' (see below), developed with the Environment Agency. The Adaptation Wizard can be accessed at www.ukcip.org.uk/resources/tools/adapt.asp.

UKCIP02 climate change scenarios

The UKCIP02 climate change scenarios provide information on possible changes in the UK's climate at a regional level and on the potential for changes in extreme weather events. A briefing report provides an accessible introduction to the main climate changes expected in the UK. A technical report gives more detailed information. Climate data can be downloaded from the UKCIP website, but users must first register for a (free) licence.

Risk framework

The report was prepared by the Environment Agency's Centre for Risk and Forecasting and UKCIP, with funding from Defra. 'Climate adaptation: risk, uncertainty and decision-making' provides a step-by-step decision-making framework to help businesses and the public sector to assess the risk posed by climate change, and work out how best to respond. It helps users to answer the questions: what climate change risks could affect my decision, what adaptation measures are required; and when should they be implemented? Four examples show how the risk framework can be applied.

Costing the impacts of climate change

'Costing the impacts of climate change in the UK' provides a method to work out the costs of climate change impacts on an organisation, an event or an area. It introduces a method for valuing the impacts of climate change and shows how to compare these to the costs of adaptation. An overview report, aimed at decision-makers, contains background briefing and examples to demonstrate how the method works. For analysts doing costing exercises, an accompanying implementation report is available on CD.

It is designed to be used in conjunction with the decision-making framework described in 'Climate adaptation: risk, uncertainty and decision-making' (above).

Socio-economic scenarios

Four socio-economic scenarios were developed for the UK, and these aim to describe framework conditions for social and economic development that can be used to assess vulnerability and policy responses to climate impacts at the UK regional level. While the socio-economic scenarios do not claim to predict the future, they provide useful 'storylines' that can be used as a tool for thinking about the future. A guide to their use is available from UKCIP.

UKCIP e-news

UKCIP produces a monthly email newsletter, e-news, to keep you up to date on latest developments in climate change impacts and adaptation. It includes information

on research, news and events, with links to more detailed information sources. Subscription is via the UKCIP website, and is free of charge.

Adaptation case study database

A searchable, web-based case study database which will provide worked examples using UKCIP tools, and other case studies of adaptation in practice is in development. A prototype will be available in late 2005.

Climate change partnerships in the UK

The English regions and the devolved administrations all now have or are developing climate change partnerships (details below) that bring together local stakeholders who share an interest in climate change issues. The partnerships share information and provide a focal point for action on climate change in their communities. Some focus only on climate change impacts and adaptation, while others also incorporate work on climate change mitigation.

England

Sustainable Development Round Table for the East of England

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Sustaine

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South West Climate Change Impacts Partnership

Sarah Hendel-Blackford will take up her post as Regional Co-ordinator in August 2005. Until then please contact Pete Grigorey
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Yorkshire & Humber Regional Climate Change Partnership

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Hazel Campbell

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Scotland

Scottish Climate Change Impacts Partnership

This partnership is being developed by the Scotland and Northern Ireland Forum for Environmental Research (SNIFFER)

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W: <http://www.countryside.wales.gov.uk/>

Other sources of information: impacts and adaptation

Environment Agency

The Environment Agency (EA) provides high quality environmental protection and improvement in England and Wales. The EA works with businesses and other organisations to prevent damage to the environment by providing education and guidance. Where necessary, it enforces regulations through prosecutions.

www.environment-agency.gov.uk

The Scottish Environment Protection Agency

The Scottish Environment Protection Agency (SEPA) is responsible for the protection of the environment in Scotland. Its task is to protect the land, air and water - the core elements that form the fabric of the environment. SEPA does this in partnership with others, and in a way that enables Scotland to sustain a strong and diverse economy.

www.sepa.org.uk

Department for Environment, Food and Rural Affairs

The Department for Environment, Food and Rural Affairs (Defra) takes the lead on climate change issues for the government. Its website has useful links to sites with information about, for example, emissions trading, renewables, planning guidance and building regulations.

www.defra.gov.uk/environment/climatechange/02.htm#links

Department for Trade and Industry

The Department for Trade and Industry (DTI) has information for businesses on sustainable development and environmental issues. It includes information about business opportunities, the DTI's activities to promote sustainable development and environmental responsibilities, and links to business support/advice, related government and international sites.

www.dti.gov.uk/for_business_environmental.html

Scottish Executive

The Scottish Executive is the devolved government for Scotland. It is responsible for most of the issues of day-to-day concern to the people of Scotland. The Environment and Rural Affairs Department has responsibility for advising on climate change policy in Scotland.

www.scotland.gov.uk

Department of the Environment in Northern Ireland

The Environmental Policy Group within the Department of the Environment in Northern Ireland (DOENI) has responsibility for climate change policy issues.

www.doeni.gov.uk

Welsh Assembly Government

The Assembly has a duty under the Government of Wales Act 1998 to promote sustainable development. It is the only Government in Europe to have such a constitutional duty. The Assembly has, in particular, taken adaptation action in relation to flooding and land use planning issues.

www.wales.gov.uk

Other sources of information: reducing greenhouse gas emissions

The Carbon Trust

The Carbon Trust helps business and the public sector cut carbon emissions, and supports the development of low carbon technologies.

www.carbontrust.co.uk

The Energy Saving Trust

The Energy Saving Trust's goal is to achieve the sustainable and efficient use of energy, and to cut carbon dioxide emissions. It is working with households, business and the public sector in the areas of energy efficiency, road transport and renewable energy.

www.est.org.uk



The UK Climate Impacts Programme (UKCIP) helps organisations assess how they might be affected by climate change, so they can prepare for its impacts. Based at the University of Oxford, UKCIP was set up by the Government in 1997 and is funded by the Department for Environment, Food and Rural Affairs (Defra).



UKCIP has co-ordinated stakeholder-led studies on the climate change impacts for all regions of England and for Northern Ireland, Scotland and Wales, as well as studies in a number of sectors, including health and the built environment.

In 2004, UKCIP began work with professional bodies and trade associations to develop ways to help the business sector to take account of the impacts of climate change in a pilot project - A Changing Climate for Business. This report outlines the achievements of the project.

This report is intended for businesses and business support organisations as they start to consider the impacts of a changing climate. It should provide the information needed to explore the opportunities and threats which climate change presents:

- climate change issues for business and immediate actions
- projected climate scenarios for the 21st century and guidance on how to use this data
- some examples of weather-related impacts on UK business
- a checklist for assessing potential impacts of climate change on a business or sector
- generic lessons from checklist assessments and specific lessons for some sample business sectors
- issues arising in the CCFB pilot project
- future work of UKCIP with business and how to be involved.

A Changing Climate for Business - project participants



Association of British Insurers
www.abi.org.uk



Country Land and Business Association - www.cla.org.uk



Chartered Institution of Building Services Engineers - www.cibse.org



National Farmers' Union
www.nfuonline.com



The Concrete Centre
www.concretecentre.com



Royal Institute of British Architects - www.riba.org



Council of Mortgage Lenders
www.cml.org.uk



Society of Motor Manufacturers and Traders - www.smmt.co.uk

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