Smart Guide

Adapting to Climate Change using your Business Continuity Management System

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Chapter 1.0

1.0 Introduction

Many business activities and the resources that support them depend on aspects of the weather or climate and can be disrupted by severe weather and its impacts. A survey by the Chartered Management Institute found that 54 % of businesses reported being disrupted by severe weather in 2012, making it the number one cause of business disruption for the fourth year running[1]. Most recently the winter of 2013/14 has been reported as the wettest winter in England and Wales since records began[2] with heavy rainfall and storms causing widespread flooding and disruption.

It is not possible to say that climate change alone is causing the increase in these disruptive events. Other changes are putting more value at risk, such as increasingly lean and complex supply chains and development in vulnerable locations. However, what is clear is that both the frequency of severe weather events and the value at risk are increasing[3]. This has implications for business continuity (BC) and broader business objectives. For example:

- Increasing frequency of heavy rain and rising sea levels will contribute to an increasing frequency and severity of flooding causing damage or loss of access to business premises and disruption to staff travel, supply chains or critical infrastructure
- Rising temperatures can lead to a decline in productivity through overheating of work places and disruption or quality issues where processes or products are temperature sensitive
- Increasing frequency or severity of drought, putting pressure on water demand and potentially leading to higher costs or a lack of availability. Low flows in rivers will also put pressure on the quality of water discharged under effluent consents.

Organizations need to be prepared for severe weather regardless of the cause. This can involve making physical, operational or strategic changes and includes actions that tackle the likelihood of damage or disruption as well as those aimed at managing its impacts. It can include preparing for opportunities as well as threats.

There are several resources freely available to help organizations adapt to climate change, such as those listed in the references of this guide and in the further reading sections of each chapter. Many of these talk in passing about the need to mainstream this within existing business functions or management systems. This guide does not seek to duplicate these resources but is instead aimed at supporting this mainstreaming, specifically by using a business continuity management system (BCMS).

[1] Musgrave B and Woodman P (2013) Weathering the Storm: The 2013 Business Continuity Management Survey. Chartered Management Institute.
[2] metoffice.gov.uk/news/releases/archive/2014/early-winter-stats.
[3] Trexler, MC and Kosloff, LH (2013) Adapting to Climate Change (DoShorts). Do Sustainability.

Chapter 2.0

2.0 About this guide

Purpose

It is intended that by carrying out the tasks in this guide, BC professionals will:

- Understand how climate change is influencing their risks from severe weather
- Be taking the lead on managing these risks
- Be confident that their BCMS will remain effective for managing disruptive events into the future
- Be able to make the case for additional resources to implement BC or adaptation measures
- Be capable of communicating effectively about the management of risks from severe weather and the approach to climate change adaptation both internally and externally.

Scope

This guide is aimed at any type of organization that has a strong BC culture. It covers adapting to climate change, which does not include efforts to tackle the causes of climate change or adapting to such actions by others (see definition in Chapter 3.0). While BC is used as a starting point, it offers BC managers a route into a comprehensive approach to managing climate risks across the organization. Therefore it covers benefits that may arise from climate change as well as threats, managing the effects of changing averages as well as weather events and the effects on efficiency as well as disruptions. The extent to which these issues then sit within the BCMS is up to the user.

Why Business Continuity Management?

There are other standards that may be equally appropriate for managing climate risks, such as risk management (ISO 31000), environmental management (ISO 14001), quality management (ISO 9001) and potentially many others. However, given the different terminology, approaches and perspectives it was felt that it would be useful for a single guide to focus on a single business function and associated standard.

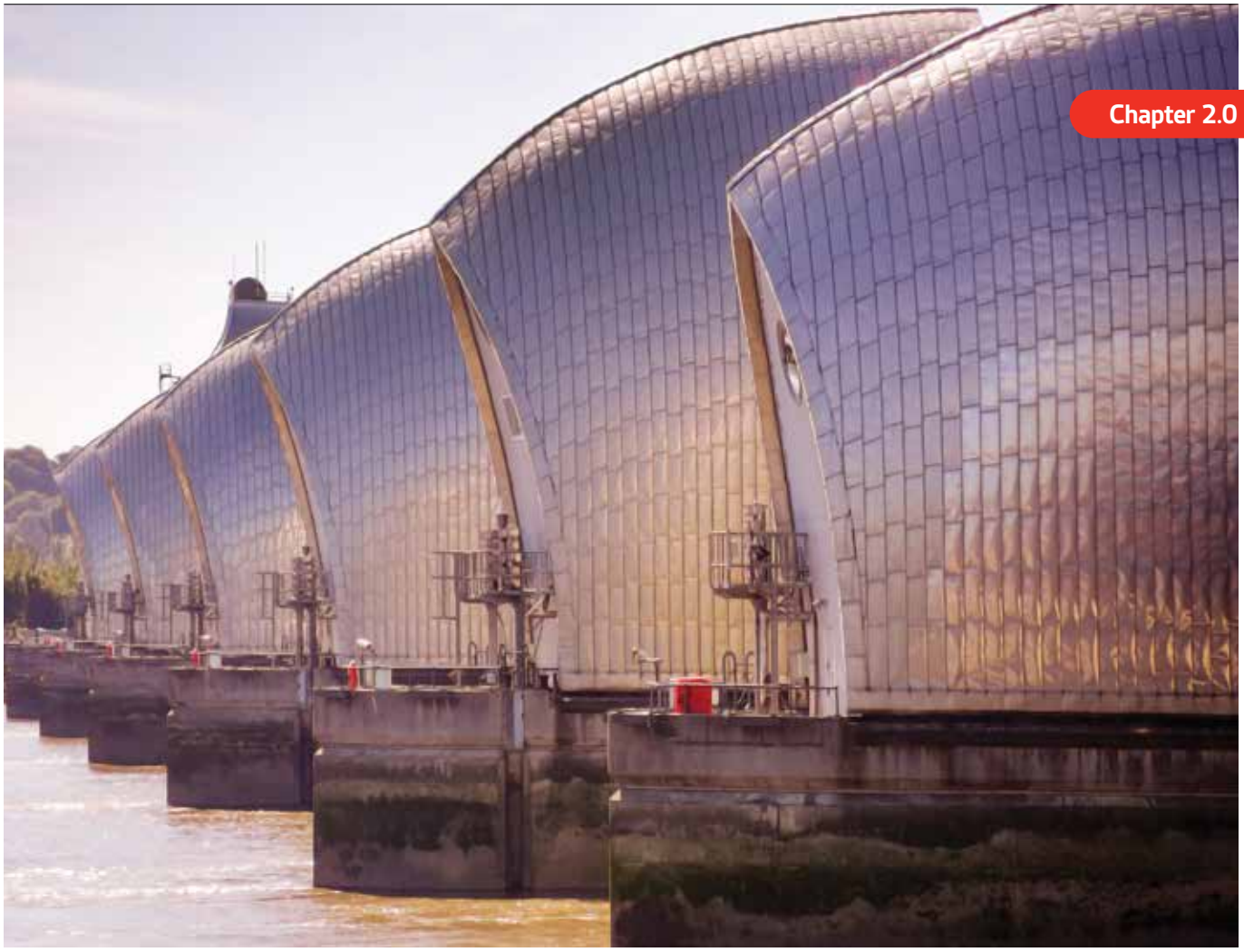
Risk management holds significant potential due to the strong risk emphasis in the climate change adaptation discourse. ISO 31000 however, is not a management system and the process nature of management system standards lend themselves well to this topic. Moreover, ISO 31000 is about to be revised. Similarly ISO 14001 will undoubtedly be influential in driving climate change adaptation when its revisions are complete. There does not need to be one universal home or starting point for climate change adaptation and the appropriate choice will vary depending on the type of business and organizational culture. However, the benefits of using a BCMS include:

- Disruption due to severe weather is the biggest climate change adaptation issue facing many organizations indicating that BC managers will likely have an important role
- Business continuity management (BCM) includes methods for, and experience of, dealing with potential and actual disruptive events as well as a remit to access and relate to all areas of the business. It is therefore well placed to lead on efforts to manage climate risks, which require cross-cutting action and are often disruptive in nature.

Adapting to climate change is moving up the business agenda with many commentators beginning to recognize the importance of BCM. For example, climate change was identified as one of 14 emerging supply chain risks by the Supply Chain Risk Leadership Council. They suggest responding through looking at BC planning both within your own organizations and with your suppliers.[4]

A survey carried out by Continuity Forum in 2013 found that 72 % of BC managers felt that it should be their role to take the lead on managing climate risks[5].

[4] SCRLC (2013) Emerging Risks in the Supply Chain 2013. White paper produced by the Supply Chain Risk Leadership Council.
[5] Continuity Forum (2013) Climate Adaptation Engagement and Standards. Written by Continuity Forum for Climate Ready at the Environment Agency.



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"Every business continuity manager has a duty to assess the risks and to determine the threats to their organization. Business continuity is about the long-term survival of your organization and climate change may be one of the biggest threats you face."

David Honour of Continuity Central[6]

"Business continuity, which is primarily concerned with identifying, reducing, mitigating and preparing for the impacts associated with disruptive events in order to reduce risk, minimize disruption and ensure continued provision of service critical activities, can be used to prepare for a range of new threats and challenges, including those associated with climate change."

Rebecca Ellis in a paper published in the Business Continuity Journal[7]

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What's special about climate change?

Adapting to climate change presents BC managers with some new challenges, which mean that traditional approaches may need to be reviewed. These are presented in Box 1 and referred to throughout this guide.

Box 1

Additional challenges that take adapting to climate change beyond traditional BCMS

1 Some aspects of adapting to climate change sit outside the traditional scope of BCM. These are:

A As well as causing disruption, weather can also affect a business in more subtle ways such as reduced efficiency (in terms of either process or manpower).

B Some sectors are vulnerable to changes in climate averages (e.g. monthly or seasonal rainfall or mean daily maximum temperature averaged over a season or month) as well as weather events. Agriculture and the water supply industry are two such sectors. See the definition of 'climate' given in Chapter 3.0.

C Some companies face significant business opportunities as our climate changes. These can arise from being ahead of the game in preparing for threats but they can also arise from beneficial effects of weather and climate, such as by accessing the growing market for adaptation and resilience to climate change products and services[8].

2 Climate change by definition means that threats (and opportunities) are changing and not static. Assessment of and reaction to climate risks may not have kept pace with these changes. In other words, the likelihood of severe weather events may be greater than an assessment based on past experience would suggest and things that have not happened in the past at all could now be possibilities. A particular concern is around scenarios arising from the combination of different weather events (such as dry periods followed by heavy rain or a succession of unusually wet seasons), or those leading to widespread or prolonged disruption.

3 Climate change is a long term and dynamic phenomenon and therefore requires a response that takes into account future and changing threats (and opportunities) and how these interact with business timescales. BCM, however, tends to be focussed on short timescales and does not generally engage with long-term drivers[9].

[6] David Honour, Continuity Central continuitycentral.com/feature0198.htm.
[7] Ellis, R. (2007) The Rising Tide: Climate Change and Business Continuity. The Business Continuity Journal. Volume 2 issue 1.
[8] Department for Business Innovation and Skills (2013) Adaptation and Resilience to (Climate Change) 2011 to 2012.
[9] Continuity Forum (2013) Climate Adaptation Engagement and Standards. Written by Continuity Forum for Climate Ready at the Environment Agency.

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How to use

Adapting to climate change involves a set of processes which have been described in a number of existing frameworks and tools. These vary slightly depending on the intended audience and context but the basic steps remain the same. This guide describes these steps in the context of a BCMS as set out in ISO 22301 and ISO 22313 using the following breakdown of processes:

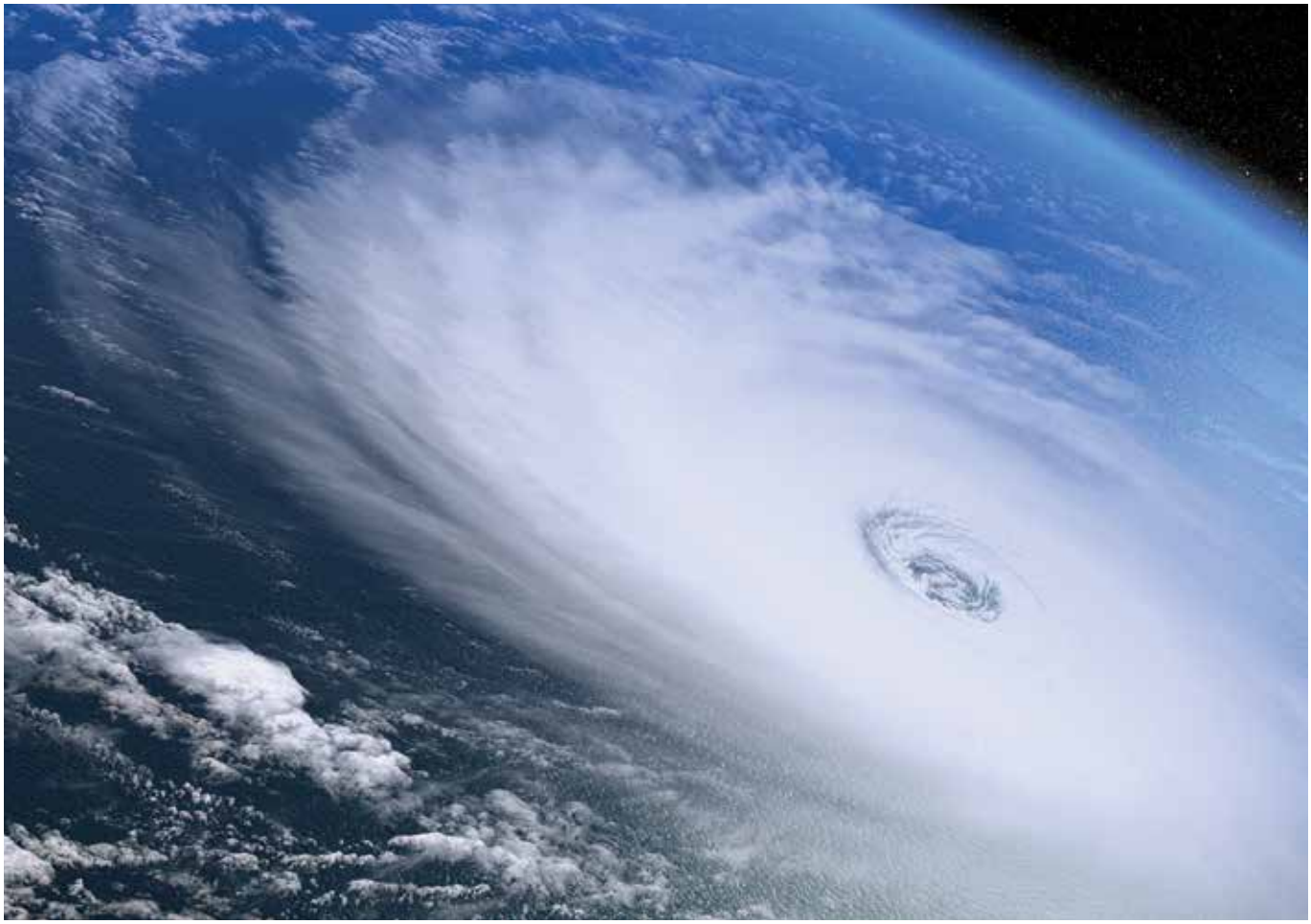
- Reviewing the context of the organization
- Developing leadership
- Understanding the key issues
- Preparing for severe weather and climate change
- Evaluating performance.

Within each process sits a number of tasks. These do not need to be undertaken in order and the effort and detail that is required will depend on the context of the organization. Appendix A provides a template, which may be useful for planning these processes.

Large companies may wish to focus initial activity on a single site, division, project, or business area (e.g. by matching the scope to that of an exiting BCMS) in order to keep the work manageable and the time cost low while learning about the subject.

This guide is designed to be standalone document. However, in order to facilitate the integration of climate risk management into a BCMS, reference is made to the current BC standards ISO 22301 and ISO 22313. These represent best practice, with ISO 22301 specifying the requirements while ISO 22313 provides supporting guidance. The structure of these standards is used in this guide with each section linked to the appropriate clause to aid cross reference.

References that support the text are provided in footnotes, however, those that may be useful as further reading are listed at the end of each chapter.



Chapter 3.0

3.0 Terms and Definitions

Adapting to Climate Change

Making changes in response to the expected effects of climate change in order to minimize the threats or exploit opportunities.

NOTE: This does not cover effects arising due to efforts (either internal or external) to tackle the causes of climate change, such as by reducing greenhouse gas emissions or improving energy efficiency. In climate policy this is termed 'mitigation'. This definition is inconsistent with that commonly used in risk management when it is common to talk about mitigating risks.

Benefits

Positive effects on an organization of a weather event caused by climate change.

NOTE: The term 'impact' is avoided because in the context of BCM, business impacts usually refers to the consequences of a disruption.

Climate

A construct of the long-term averages (usually averaged over 30 years) of weather variables, such as temperature and precipitation, over a particular location.

Climate change

Changes in climate over time regardless of the cause.

Climate risk

The uncertain effects of weather or climate change on objectives.

NOTE: This definition was developed for this guide using the standardized definition of risk as 'the effect of uncertainty on objectives' (ISO 31000).

Threats

Negative effects on an organization of a weather event caused by climate change.

Chapter 4.0

4.0 Reviewing the Context of the Organization

This section describes how to review the context of the organization in light of the desire to adapt to climate change. It is divided into three tasks:

Task 1: Identify climate influenced external and internal factors.

Task 2: Identify any new interested parties and requirements.

Task 3: Review and amend BCMS scope.

Note that there are not currently any legal or regulatory factors that need to be taken into account although it is possible that this may change in the future, for example if a legal temperature limit for workplaces were introduced.

Task 1: Identify climate influenced external and internal factors

(Related clause in ISO 22301 and ISO 22313: 4.1 (in particular 4.1b in ISO 22301))

Like other aspects of the natural environment, the climate provides the conditions upon which businesses depend. Climate change can therefore be seen as an external factor that affects the organization either directly or through its influence on other external factors. Box 2 lists external factors to consider using the categories described in ISO 22313. Note that the categories 'relationships with and perceptions of, interested parties outside the organization' and 'supply chain commitments and relationships' are also important, especially where the relationship involves a shared risk, but that these are picked up later under Task 2.

If you have suppliers and customers outside the UK then the projected climate trends in those regions will need to be considered. A list of sources of international information on climate and related hazards is provided in the further reading section for this chapter. However, there is no need to go into a lot of detail for this task and simply flagging it up as a factor may be enough.

Box 2

Climate influenced external factors

Climate trends:

- Changes to climate averages (in the UK)[10]
  - **Hotter summers**
  - **Milder wetter winters**
  - **Rising sea levels**
- More frequent severe weather (in the UK) events in the form of heavy rain, droughts and heat waves
- Less frequent snow/low temperature events - however, their severity is expected to remain the same
- Climate change in key locations overseas

The social, cultural, financial, technological, economic and natural environment:

- Severe weather events including storms, floods, droughts, heatwaves, snowstoms etc
- Damage/disruption to infrastructure (energy, water and transport)
- Resilience of built environment e.g. flood defences, urban design etc
- Changes to price or availability of raw materials
- Changes in demand for product or service
- Stability and well-being of sourcing community

Make a note of any internal factors (such as activities, services, products and supply chains) that involve long planning horizons, particularly vulnerable locations or a high degree of sensitivity to weather, climate or indoor temperature. Box 3 explains this further. Only the first of these criteria are uniquely relevant to climate change and much of the others will have already been captured in a well founded BCMS. However, it is a good idea to check, in order to make sure that you are adequately prepared for severe weather (see point 2 in Box 1).

As well as thinking about your current activities, services, products and supply chains, you should consider those involved in any upcoming new initiatives so that you can plan ahead appropriately.

Some resources for exploring the effects of climate change outside of the UK are contained within the further reading section. Remember to consider not just industrial sites and offices but also staff homes and key staff travel or logistics routes.

Climate change means the future can no longer be expected to reflect the past. Nevertheless, exploring how past weather events have affected you will help you to identify any sensitive internal factors. This can be done by generating a simple catalogue of the business impacts of past weather events. A record of how you responded to these events will also be helpful when you come to identifying or evaluating potential future adaptation options (Task 9). A template for this is provided in Appendix B.

The focus should be on events that had significant business impacts, which may not match up exactly with those defined as 'severe' weather. Therefore, it is not advisable to use Met Office weather data as a starting point. Instead, draw on company records, employee recollections and the experience of others in your locality or sector. Near misses can also be included, for example, where you know that if a disruption had lasted for a day longer, the consequences would have been significant, or where you only just managed to prevent significant damage. If you have the resources a workshop is a good way of gathering this information as well as starting the process of internal engagement on this issue[11]. Although anecdotal evidence needs to be treated with caution when being used as part of an assessment, this approach has shown to be invaluable in generating the kind of depth of understanding required in creating stories that can be invaluable in engaging others.

Other sources of information on sensitivity include any limits, such as to temperature for industrial equipment or to wind speeds for crane operation. These may be set out within technical specifications, operating manuals, contractual agreements, codes, standards and other similar documents. New companies will need to rely on these sources and the experience of others to develop this information.

[10] Jenkins, G. J., Murphy, J. M., Sexton, D. M. H., Lowe, J. A., Jones, P. and Kilsby, C. G. (2009). UK Climate Projections: Briefing report. Met Office Hadley Centre, Exeter, UK.
[11] Based on Step 2 of the Adaptation Wizard: Climate Ready (2012) The Adaptation Wizard. The Environment Agency.

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Box 3

Climate influenced internal factors

Internal factors that are influenced by climate change are those that:

- Have long planning horizons

Where planning horizons are short, exposure is only to the current climate whereas if they are long the factor is exposed to both the current and the future climates.

- Are in particularly exposed locations or rely on several locations

These include: locations that are next to waterways; on the coast; in low lying areas; unsheltered from storms; unshaded from the sun; in areas of water scarcity or in urbanised areas; which can often be hotter than surrounding areas especially at night due to the change in land use and waste heat generated by energy use. Some parts of the world are particularly prone to weather disasters while climate change will affect regions differently. Long supply chains are particularly exposed because they rely on several different locations.

- Are sensitive to or dependant on weather, climate or indoor temperature

Some materials or processes are temperature sensitive e.g. the waterless printing process.
Others depend on specific elements of the climate, such as agriculture or water intensive manufacturing.
Biological systems can also be sensitive.
This includes people, for example, those who are older or unwell are particularly sensitive to heat stress and the difficulties of working outdoors in inclement weather.
Some outdoor activities are hampered by or cannot take place in inclement weather in particular those involving heavy industry, with tight health and safety controls.

- Are dependent on suppliers or raw materials that fulfil any of the previous three criteria.

Risks are passed through supply chains affecting price or availability of raw materials or continuity of supply.

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Task 2: Identify any new interested parties and requirements

(Related clause in ISO 22301 and ISO 22313: 4.2)

There are several groups and individuals with an interest in climate change, from whom new requirements may arise. A checklist based on the categories presented in ISO 22313 is given below.

Potentially relevant interested parties and their requirements:

Government

- The Climate Change Act (2008) includes a mechanism by which the government can require organizations to report on their climate risks and how they are managing them. This is known as the Adaptation Reporting Powers (ARP). So far only organizations involved in the delivery of critical infrastructure have been asked to report
- The Environment Agency's Climate Ready Support Service are interested in your activities in order to share learning and improve tools and guidance.

Pressure Groups/investors

- If you are committed to submitting a response to the Carbon Disclosure Project (CDP), there is a question that asks you to identify key climate risks and adaptation measures
- There are currently few other mechanisms for investors but there is scope for this to change in the future
- Development NGOs concerned about the communities supported by your international suppliers
- Local flood groups concerned about flood risks that you may share with local communities.

Staff

- All staff will have a stake in the effects of severe weather and climate change on their welfare, including how it affects their homes and travel
- Your environment manager or similar may already own responsibilities on adapting to climate change with associated actions
- Those with operational responsibilities may have interests relating to the specific temperature or weather limits associated with equipment or processes
- Your health and safety manager will be interested in the many ways that internal temperature and inclement weather interact with workplace health and safety.

Customers

- Customers may be interested in managing their supply chain risks

Trade groups

- Many sector bodies have taken a role in supporting their members through weather resilience or adapting to climate change, such as through commissioning research or provision of skills or accreditations etc.

Suppliers/neighbours/regulator

- Those with whom climate risks are shared e.g. for a regulator this could be in relation to potential pollution incidents caused by severe weather
- Your local Climate Change Partnership will be interested in your actions and able to connect you with other local relevant activity.

Remember to include these new interested parties in any communication activities around your BCMS and to include relevant aspects of your BCMS in any other communications with them, such as reporting under the CDP or ARP.

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Task 3: Review and amend the scope of your BCMS

(Related clause in ISO 22301 and 22313: 4.3)

Review the scope of your BCMS in light of the three points raised in Box 1 and the output from Task 1 and Task 2.
You may want to amend the scope to make sure that it covers long-term considerations and non-disruptive threats and benefits.

Long-term considerations

If you have identified areas where there are long planning horizons you will need to engage with the future climate and climate change. This will help you to avoid making decisions that embed vulnerability and to identify where it may be cost effective to implement measures early on in a process (rather than retrofitting, which is usually more expensive).
It may therefore be necessary for the BC manager to be closely involved with products, services, locations, functions, processes or activities not previously covered by the BCMS, such as the design stage of a new building or planning stage of a new initiative. This in turn may have implications for the scope.
If you do not have long planning horizons in any area of your business then you need only be concerned with the current climate and how it may have already changed, therefore there are no implications for your BCMS scope.

Non-disruptive impacts

Think about how you will take account of the effects of weather or climate that do not arise through disruption and are therefore outside the scope of your BCMS.
These include:

- Where weather or climate contribute to a reduced or increased efficiency. The decline in productivity associated with thermal discomfort during heatwaves is an example of this
- Business opportunities arising from climate change, such expanding markets or new market opportunities, increased production efficiencies or new production opportunities.

You don't need to make everything your job but it is important to identify what is to remain outside the scope of your BCMS and link to other appropriate business functions under the banner of adapting to climate change. As well as your overall risk management strategy, health and safety arrangements, HR, business planning and strategic planning may all have relevance.

Further reading for Chapter 4.0

For information about climate change in the UK see United Kingdom Climate Projections 09 (UKCP09) (ukclimateprojections.metoffice.gov.uk).

For information about climate change in Europe see Climate-Adapt (climate-adapt.eea.europa.eu).

For climate information from around the world see:

- Information on observed and projected climate change and its impacts in 24 countries (metoffice.gov.uk/climate-change/policy-relevant/obs-projections-impacts)
- An assessment of the impacts of climate change overseas on the UK, International Threats and Opportunities of Climate Change for the UK, (pwc.co.uk/sustainability-climate-change/publications/international-threats-and-opportunities-of-climate-change-to-the-uk.jhtml)
- Foresight report 2011: International Dimensions of Climate Change (gov.uk/government/news/report-highlights-new-challenges-to-the-uk-from-international-climate-change--2)
- The Global Risk Data platform produced by UNEP (United Nations Environment Programme) may help in determining which suppliers are in vulnerable locations: preview.grid.unep.ch/index.php?preview=map&lang=eng
- IPCC (Intergovernmental Panel on Climate Change) Fifth Assessment Report, Climate Change 2013, The Physical Science Basis (ipcc.ch/report/ar5/wg1/)
- IPCC Fifth Assessment Report, Climate Change 2014, Impacts, Adaptation and Vulnerability (ipcc.ch/report/ar5/wg2/)
- IPCC Special Report, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) (ipcc-wg2.gov/SREX/).

See Climate UK for the contact details of your local climate change partnership climateuk.net/

For general information and guidance see:
The UK Government web page on adapting to climate change: gov.uk/government/policies/adapting-to-climate-change
or contact the Climate Ready support service climatechange@environment-agency.gov.uk
UKCIP: www.ukcip.org.uk

Chapter 5.0

5.0 Developing Leadership

As with any new initiative, strong leadership will be important for the success of your adaptation planning as it will secure the required commitment and resources from across the business. This section outlines three tasks that will help put this leadership in place:

Task 4: Make the case to top management

Task 5: Review and amend your BC policy

Task 6: Define any new roles, responsibilities and authorities

Task 4: Make the case to top management

(Related clause in ISO 22301 and 22313: 5.2)

Top management need to be committed both to adapting to climate change (even if you choose not to use this terminology as suggested in Table 1) and to do so as part of the BCMS. This task aims to help you make this case in support of obtaining this vital commitment. The information given in Chapters 1.0 and 2.0 may also be useful here, in particular the section on 'Why BCM?'.

It is difficult to make a clear business case for adaptation because of the difficulty in quantifying the costs of future climate impacts. However, a case for exploring further and for embedding within your BCMS can be made in general terms at an early stage. This should be concise and may benefit from a light touch version of Tasks 7 and 8. You can do this as a desk based exercise, however, active workshop approaches can be very useful in drawing out critical climate dependencies in order to help engage internal stakeholders[12]. Table 1 on the following page provides some principles for building a business case for adaptation.

This is taken from a guide produced by the Institute of Environmental Management and Assessment (IEMA) and is based on the experience of environmental and sustainability practitioners. Some of the actions suggested may not be possible until leadership has been obtained and more in depth work carried out. These can be revisited as part of Tasks 9-12 and depending on the level of business case that is required an iterative approach may be appropriate.

Below is a checklist of things that could be included:

- Examples of how weather has affected you in the past and any associated costs
- A list of key drivers: external and internal factors and the requirements of interested parties
- A brief explanation of how adapting to climate change goes beyond normal BCMS (Box 1)
- Examples of actions taken by others.

[12] IPCC Fifth Assessment Report. Climate Change 2013. The Physical Science Basis.
[13] IEMA (2013) Climate Change Adaptation: Building the Business Case. Guidance for Environmental and sustainability practitioners. For more information the full guide can be downloaded from here: iema.net/readingroom/articles/cca-business-case-guidance.

Table 1: Building the adaptation business case – principles and learning points (adapted from IEMA's Guide to Building a Business Case for Adaptation[13])

Principles	Learning points (from practice)
First understand your business and your context	Understand its purpose, culture and approach to decision making. Know what you are up against. Map key stakeholders and decision making routes. Evaluate and develop your role to the business context (e.g. Lead? Inspire? Support? – probably all three at different times).
Engage key internal stakeholders	Communicate with (and seek advice from) a range of business functions such as finance, marketing, procurement, logistics and operations. Further develop your understanding of the organization and internal decision making, business drivers etc. Build awareness and support. Introduce the business relevance of climate change threats, opportunities and dependencies.
Use business relevant language	In discussions either avoid terms like 'adaptation' or be careful to consistently translate. Use business language - profitability, opportunity, cost savings, avoiding disruption, staff welfare, client and customer service, avoiding liabilities, added value, winning business, improving reputation, insurance savings, changing asset value, and opportunities for future business.
Use direct business experience	Draw on recent experience within the business of extreme weather impacts – use to win interest in early action (this can also help the visualization of future increased risk). Make sure that you present both the worst case scenario and the most likely outcome. Avoid the tendency to present just doom and gloom, and ensure that the work is solutions focused.
Consider wider skill needs	Training may be valuable at early stage and can support internal scoping workshops. External expertise may be needed (e.g. flood risk).
Consider external input	Consider partner opportunities to support (e.g. sector/regional initiatives). Contribution from external advisors or stakeholders? Advice/requirements from clients?
Use projections and be transparent (e.g. on scenarios and uncertainty)	Do use formal climate change projections and remember businesses are used to dealing with uncertainty and imperfect information. Be transparent on the status of any projections and information. In addition feel confident to include high emission scenarios if you can justify (i.e. some view high emissions scenarios as more credible given current failure on global emission targets).
Cost/quantify business impacts? (sufficient for decision)	Future climate related business costs are a challenge but some can be estimated - e.g. by assessing impacts of past weather events (£ loss) and projecting forward. Other factors can be quantified (e.g. reputation may consider positive or negative media coverage in column inches). However avoid 'over creative' accounting. The degree of work required for a decision should be considered with a balance of what can and can't be quantified. Clearly state assumptions and dependencies.
Use existing processes (don't reinvent wheel)	Look to use other existing business processes where they offer scope for action on climate change adaptation (e.g. procurement, risk management, environmental management system and sustainability, annual business planning etc).
Look for win wins (Trojan horse... piggy back)	Wider agendas offer scope for effective action on climate change adaptation. For example, heating and cooling (staff comfort) requirements in future premises as adaptive considerations within low carbon design and more energy efficient buildings. Adaptation can contribute to other business considerations underway (e.g. flexible and remote working of key personnel, or increased resilience as part of wider procurement and sustainable supply chain initiatives).
Opportunities and comparative advantage	Investigate with colleagues opportunities for increased business (products and services). Also consider the comparative business advantage from resilience.
Try things out	Do not underestimate the importance of making a start. Trialling solutions on site with willing colleagues or business partners can be an important first step (demonstrators).

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Task 5: Review and amend your BC policy

(Related clause in ISO 22301: 5.3)

In order to make sure it is clear that the impacts of climate change are covered by your BCMS you may wish to amend your BC policy so that it explicitly makes reference to climate change and/ or new and changing risks. This may or may not refer to adaptation as a separate activity. Some examples are given below:

- Continue to deliver key business functions, mission, aims and objectives in the face of a changing climate
- Maintain business continuity and build resilience to weather variability now and in the future
- Ensure your business is adapting well to climate change, with the objective of long-term sustainability of the organization
- Minimize the threats and maximize the opportunities from a changing climate while building the adaptive capacity of your organization, supply chain and wider stakeholder community
- Assess the impacts of climate change; consider climate change impacts in specific on general practices or operational policies (such as procurement or project appraisal); develop organizational resilience; or build adaptive capacity.

Alternatively, this commitment could be made in your environmental policy and linked to as an internal factor affecting your BCMS.

Task 6: Define any new roles, responsibilities and authorities

(Relevant clause in ISO 22301 and ISO 22313: 5.4)

Since you are adapting to climate change using a BCMS, the lead role will be assigned to the management representative for your BCMS or whoever is responsible for business resilience. However, you may wish to assign a formal role to someone in an environmental business function as due to the subject area they may be a useful source of additional knowledge or relationships.

Some other new roles and responsibilities may need to be allocated across a number of different functions. Use the output of Task 1 to identify key business areas where colleagues will need to be engaged. Their role in Tasks 7 and 8 is to input into the analyses drawing on their knowledge and experience of the business. Following that there may also be roles related to implementation.

Further reading for Chapter 5.0

IEMA (2013) Climate Change Adaptation: Building the Business Case. Guidance for Environmental and sustainability practitioners.: iema.net/readingroom/articles/cca-business-case-guidance.

Chapter 6.0

6.0 Understanding the Key Issues

Business Impact Analysis (BIA) and risk assessment (RA) form the backbone of BC planning. Climate change considerations can be factored into these processes, making sure that the future is recognized as being different from the current situation, which in turn is different from the past. This may require new sources of information and ways of thinking.

There are different views on the relative importance of BIA and risk assessment within the BC community. Both processes have features that offer some advantages over the other in the context of adapting to climate change as follows:

Advantages of BIA:

- By focussing on the business impact regardless of the source, BIA takes away the need to estimate the likelihood of an event or disruption. This can make assessments quicker and easier in the absence of robust information, which is often the case with regards to the effects of future weather events or climate change
- The immediate focus on critical products and services and the activities and resources that support them also offers a practical way of prioritizing in order to allocate resources without the need for lengthy assessment processes based on very incomplete and complex information

Advantages of RA:

- Risk assessment offers a more complete picture and therefore will pick up a wider range of threats and benefits
- Similarly, an understanding of risks is more likely to lead to creative thinking around solutions. This may be important as climate change begins to affect us in ways we haven't experienced before.

ISO 22301 specifies the use of both but the relative emphasis and order in which they are undertaken here depends on your preferred approach and the organizational culture. However you choose to proceed, keep track of methods and information used as well as the reasons behind any decisions made so that these can be monitored and reviewed as appropriate.

Task 7: Review and amend your Business Impact Analyses

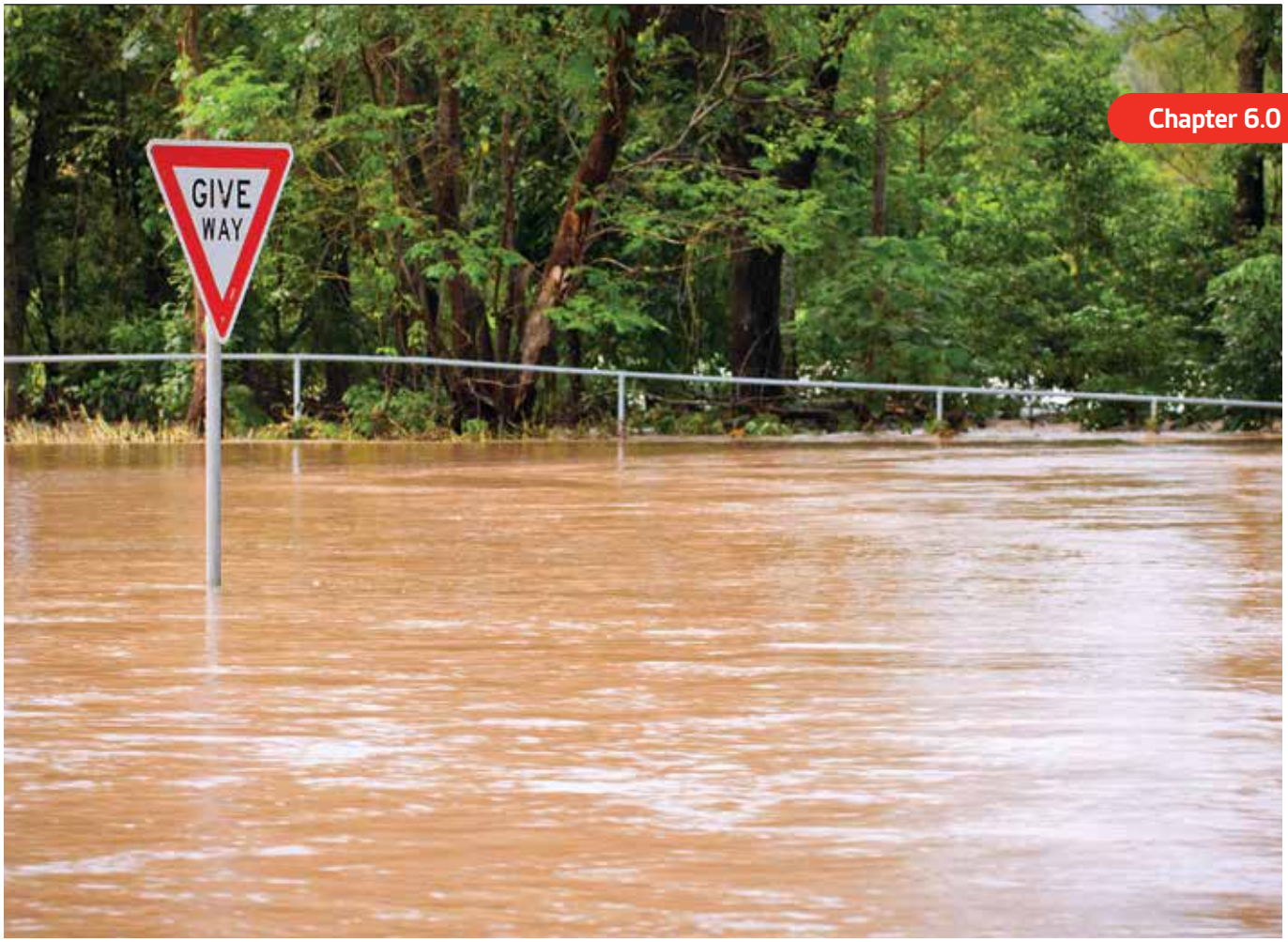
(Related clause in ISO 22301 and 22313: 8.2.2)

BIA focuses on the business impacts of disruption regardless of the source of the disruption so that you would expect impacts from severe weather to already be included. However, a light touch review may be required to take account of any change in scope and any ways in which the size of the potential business impact or the way that it plays out may be affected by climate change.

Referring to your existing BIA (or equivalent), begin by identifying any business impacts of disruption that involve any of the climate influenced internal factors identified in Task 1.

Ask yourself if the impact could be greater or play out differently over time, given this influence. In particular include in your analysis how the following would affect the outputs of your BIA:

- Weather that is more severe or prolonged than previously experienced
- A weather event that occurs during the recovery period of a previous disruption
- Weather events that involve widespread disruption or a combination of different events.



Chapter 6.0

Task 8: Climate risk assessment

(Relevant clause in ISO 22301 and ISO 22313: 8.2.3)

It is now "unequivocal" that the climate system is warming and "extremely likely" that human activity is the dominant cause of this warming[14]. However, plenty of uncertainty remains in terms of the rate and geographical distribution of this change and the effects it will have.

Risk is defined as the effect of uncertainty on objectives (ISO 31000). The concept of risk can be useful when making decisions in the face of uncertainty and is therefore useful when adapting to climate change. A risk assessment can be used to identify significant threats or benefits. Normally this is done by making judgements on their likelihood and the severity of the impact for explicit objectives. It can also be used to evaluate a range of adaptation options (Task 9).

ISO 22301 requires that a risk assessment is conducted for prioritized activities. Carrying out this task will make sure that climate related threats and benefits to these activities are taken into account within your risk assessment.

The first step is to identify threats and benefits. A brainstorming or workshop that uses different categories can help to make sure your list is comprehensive and not biased by whatever the most recent disruptive experience has been. Table 2 shows some examples using the categories of 'business areas' from the Business Areas Climate Impacts Assessment Tool (BACLIAT)[15], however there may be other categories that make more sense for your organization. For example you may wish to use the resources that are required to support your critical activities as categories in order to give the assessment a clear link to your BCMS. Draw on past experience but also think about things that could happen that you have not already experienced using your list of key external and internal factors identified in Task 1.

[14] IPCC Fifth Assessment Report, Climate Change (2013), The Physical Science Basis.

[15] Climate Ready (2012) The Business Areas Climate Impacts Assessment Tool (BACLIAT), The Environment Agency.

Table 2: Examples of business impacts broken down by BACLIAT headings

Business area	Threats	Benefits
Markets	Decline in demand for cold weather related goods and services. Lower footfall in high street shops during inclement weather.	Increase in demand for goods or services or new market opportunities e.g. • Tourism activities • Summer food and drink • Flood defence technologies
Logistics	Disruption to supply chains, utilities or transport arrangements due to flooding, rain, heatwave or drought.	Fewer cold/ snow related disruptions.
Premises	Impacts on building fabric and structure and the comfort conditions of the internal environment.	Easier and cheaper to keep buildings warm in the winter.
People	Negative effects on health and comfort of staff and customers e.g. • Thermal discomfort • Heat stress • Increased risk of warm weather related pests and diseases • Psychological effects of flooding	Positive effects on health and comfort of staff and customers: Fewer cold related illnesses.
Process	Impacts on temperature or weather dependent processes or activities e.g. • Health and safety stoppages due to weather • Breakdown of temperature sensitive equipment • Lack of availability of water for industrial processes	Increases in productivity or new processes becoming economically viable e.g. • Fewer construction delays due to cold weather • New agricultural crops or varieties are able to grow
Finance	Increase in price or availability of insurance due to climate risks. Investors concerned about climate risks.	Resilience or good management of climate risks attracts investment.

For the threats and benefits identified, carry out a risk assessment in the same way as you would for other types of risk. However, because by its very nature climate change presents changing risks, the following two considerations should be added to your methodology:

- Understand the timescales of relevant decisions
- Use information about the future rather than the past.

As you assess the risk of each threat or benefit, think about how far into the climate future it is necessary to look. This will depend on the lifetime of decisions associated with it. For example, when assessing threats or benefits associated with large-scale fixed assets or long term contracts assess their likelihood by thinking about what the climate will be like at the end of its life. In addition, remember that the climate is not the only thing that is changing so also consider changes to other external or internal factors, such as changes in locations or technologies.

Chapter 6.0

Further reading for Chapter 6.0

For further help with identifying threats and benefits and assessing climate risk see 'Assessing and Managing Climate Change Risks in Supply Chains' available from acclimatise.uk.com/resources?resource=202.

For information about climate change in the UK see United Kingdom Climate Projections 09 (UKCP09) (ukclimateprojections.metoffice.gov.uk).

For information about climate change in Europe see Climate-Adapt (climate-adapt.eea.europa.eu).

For climate information from around the world see:

- Information on observed and projected climate change and its impacts in 24 countries (metoffice.gov.uk/climate-change/policy-relevant/obs-projections-impacts)
- An assessment of the impacts of climate change overseas on the UK, International Threats and Opportunities of Climate Change for the UK (pwc.co.uk/sustainability-climate-change/publications/international-threats-and-opportunities-of-climate-change-to-the-uk.jhtml)
- Foresight report 2011: International Dimensions of Climate Change (gov.uk/government/news/report-highlights-new-challenges-to-the-uk-from-international-climate-change--2)
- The Global Risk Data platform produced by UNEP may help in determining which suppliers are in vulnerable locations: preview.grid.unep.ch/index.php?preview=map&lang=eng
- IPCC Fifth Assessment Report, Climate Change 2013, The Physical Science Basis (ipcc.ch/report/ar5/wg1/)
- IPCC Fifth Assessment Report, Climate Change 2014, Impacts, Adaptation and Vulnerability (ipcc.ch/report/ar5/wg2/)
- IPCC Special Report, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) (ipcc-wg2.gov/SREX/).

Chapter 7.0

7.0 Preparing for Climate Change

This process involves identifying actions to address climate risks and implementing these through your BC plans and procedures or within other business functions where appropriate. It is divided into the following tasks:

Task 9: Identify adaptation options

Task 10: Review and amend BC strategy

Task 11: Select and implement preferred adaptation options

Keep track of methods and information used as well as the reasons behind any decisions made so that these can be monitored and reviewed as appropriate.

Task 9: Identify adaptation options

(Relevant clause in ISO 22301: 6.1)

Referring to the risks identified in Task 8, brainstorm or identify in a workshop 'adaptation options'. You may also wish to draw on the experience from other countries or organizations in your locality or sector e.g. alternative materials, technologies or processes etc. that may already exist. Adaptation options can range from large-scale infrastructure projects to simple low-tech solutions. They include measures to reduce (or increase) the likelihood of the threat or benefit occurring as well as BC plans aimed at shortening the period of disruption or to limiting its impact.

You should also consider how you can manage risks through your supply chain by either influencing or mandating suppliers to take actions to manage their own climate risks or collaborating with them on shared risks.

Box 4 illustrates this using a hypothetical example. The categories in Table 3 may be useful in brainstorming a range of options.

Box 4

Adaptation options for a hypothetical printworks[16]

Background

A small printing company produces corporate literature for a range of business customers. Each job has a timetable built into the contract, and the company's reputation depends on delivering a good service on time. Paper is delivered daily from a paper mill, which is on high ground, and there is very little storage on the site of the printworks. The city is prone to flooding, which means that as the climate changes there is an increasing risk of business disruption due to localized flooding causing traffic problems and delays to deliveries. The business impacts of this are as follows:

- Paper deliveries are disrupted by flooding in areas of the city, meaning that the company is unable to deliver the finished product to customers on time, leading to loss of reputation and declining customer loyalty.

Table 3: Adaptation options for printworks example

Type of adaptation option	Further breakdown	Specific measure
Reduce the likelihood of a disruption	Changing input, process or supplier	Use thinner paper so that more can be stored on site
	Strategic solution	Outsource all printing operations
		Switch to specialist printing so that less input is required
	Relocation	Move production to the same industrial estate as the paper mill
	Use of technology	Encourage the supplier to install live tracking of its vehicle fleet in order to help avoid areas of localized flooding and traffic disruption
	Improve physical infrastructure	Build new storage facility on site
Shorten the period of the disruption	Operational arrangements	Employ a subcontractor so that production can switch location to its premises at times of extreme weather
		Develop an agreement with other similar businesses nearby to pool paper resources at times of extreme weather
	Managerial arrangements	Make arrangements for overtime and double shifts to make up for lost production time following an event
Limit the impact of the disruption	Use of technology	Monitor flood warnings so that you know early if there will be delays
	Managerial arrangements	Stay in close contact with customers and suppliers so that customers know early on if their job will be delayed Build extra time into contracts Take out BC insurance

[16] Adapted from Box 4.1 and Table 4.1 in Johnstone K and Moczarski A (2010). Climate Change Adaptation: Adapting to climate risks using ISO 9001, ISO 14001, BS 25999 and BS 31100.

Task 10: Review and amend BC strategy

(Relevant clauses in ISO 22301: 8.3)

Review your BC strategy in light of changes you have made to your policy (Task 5) and any new requirements you have identified (Task 2) and amend as necessary.

One thing to consider is that the main impact of climate change may arise from the increasing frequency of disruption. Therefore consider defining a 'maximum tolerable frequency of disruption', which can be defined as the frequency of a specified disruptive event within an agreed time period (e.g. per year) above which would be unacceptable to the business. This is not a term currently used in BCM but could be a useful measure instead of or alongside the more familiar 'maximum acceptable outage' (MAO) or 'maximum tolerable period of disruption' (MTPD). If you know which weather variables led to this disruption (i.e. the temperature or amount of rainfall), it is possible to estimate when this frequency will be breached using the UKCP09 weather generator[17].

Another significant impact on the choice of BC strategy is that climate change effects may be widespread and therefore may require a different approach. Strategy options that provide alternative means of operating when a localized disruption occurs may not be available if the incident is affecting a larger area.

Your strategy may already include taking an iterative approach. This can allow for flexibility by prioritizing actions that can be changed later when more information becomes available and may include a process of adaptive management, which seeks to take advantage of appropriate decision points. These approaches can be particularly useful for an issue such as climate change, which influences a wide range of decisions and for which there is often incomplete information.

Task 11: Select and implement preferred adaptation options

(Relevant clause in ISO 22301: 8.4)

Referring to your BC strategy, for each climate risk identify preferred adaptation options. For some this will involve amending your BC plans and procedures. But for others you will need to make the case for putting in place measures aimed at tackling the likelihood of occurrence.

The implementation of these actions will probably sit outside your BCMS. This may already have been flagged up as you were considering your scope but if not, revisit Task 3 and make sure you have engaged the right people.

Internal engagement may be required to gain support for any actions that you think should be considered. Put together business cases that are specific to each action explaining what you expect to be gained from taking the action, drawing on the advice given in Table 1. In particular, take advantage of points in time that represent opportunities for cost-effective adaptation, such as:

- Those dictated by maintenance or renewal cycles
- The design stage of a new project
- During review of policy or strategy.

Make it clear that missing these opportunities could further embed your vulnerability to climate change.

Unfortunately it is very difficult to estimate the cost of future climate change impacts. This means that it is difficult to assess the effectiveness of different options or to identify the pay-back times or Return on Investment (RoI). An approach such as is shown in Box 5 can help make the case for investments now and in the future but will only ever provide a rough estimate of future costs because:

- It doesn't take account of changing vulnerability
- It excludes weather events of lower magnitude or other types of weather events that may also have had significant consequences.

[17] ukclimateprojections.

However, in many cases it is appropriate to use information such as this to support decisions, despite its shortcomings. This is because the alternative is to rely on either past experience or a precautionary approach, potentially leading to under or over-adaptation. Moreover, where a significant investment is required, only a quantitative analysis can help to support a financial case.

Box 5

Using the weather generator to inform adaptation strategy[18]

The objective of this assessment is to ensure sustainable energy use in a school and to inform the choice of adaptation measures. The school is new-build, so if operation of the school requires more energy than specified in the building contract, then the contracting developer is held accountable.

It is known that a persistently warm minimum temperature (exceeding 16 °C for three nights in a row) makes the building uncomfortably warm during the day. By analysing the weather generator output with the threshold detector, an increase in frequency in comparison with the baseline climate was presented (Table 4 below). This is an estimate of the number of times the threshold can be expected to be crossed in a year now and in the future (for the high emissions scenario).

Table 4: Threshold detector output:*

Time period	Estimated number of times per year the night time temperature can be expected to 16 °C for three nights in a row
Baseline period	
2040s	1,3
2050s	2,0
2060s	2,8

A number of adaptation measures were suggested to manage these climate risks, as follows:

- Increased use of green infrastructure – open spaces, woodlands, street trees, fields, parks, outdoor sports facilities and community gardens
- Solar control – includes shading (e.g. narrow corridors between buildings, vegetation canopies), orientation and building morphology to reduce solar heat gain

  Advanced glazing systems can also be used to reduce solar gain
- Increasing evaporative cooling – through use of fountains, water features, vegetated open spaces, trees and plants, and roof gardens
- Increasing ventilation – orientation and morphology of buildings to catch breezes
- Using cool pavement materials on roadways or large parking areas – to increase surface reflectivity (though it's important to avoid glare problems) or increase permeability to benefit from the cooling effect of evaporation
- Use of cool building materials on roofs or facades – to prevent storage of solar heat gain
- Building envelope insulation – to prevent penetration of heat into buildings. This includes the use of cool facade materials and green roofs
- Ground water cooling (using aquifers) or surface water cooling absorption cooling – runs on a thermal input (from hot water or the sun) rather than electricity. Many CCHP (combined cooling, heat and power) systems use this type of cooling
- Mechanical cooling, including chilled beams and conventional air conditioning systems.

Each of these adaptation measures will require additional capital investment.

Using the UKCP09 weather generator, the contractor can assess the incidence of 'heat wave events' in future decades over the concession period, to compare the likely reductions in income and higher operating or energy costs against the costs of refurbishment. This type of decadal analysis will inform decisions about when it would be most cost-effective to refurbish the school.

[18] Based on UKCP09 worked example by Acclimatise (2009) but amended using real rather than dummy data.

Chapter 7.0

One way of reviewing BC plans or procedures is through exercising (see clause 8.5). Consider climate change when designing a severe weather scenario to test, for example scenarios based on the three bullets listed in Task 7.

As you select preferred actions, you may identify additional support needs, such as awareness raising and competencies.

Further reading for Chapter 7.0

For further help with identifying threats and benefits and assessing climate risk see 'Assessing and Managing Climate Change Risks in Supply Chains' available from acclimatise.uk.com/resources?resource=202.

The UKCP09 Weather Generator and threshold detector can help estimate the frequency of occurrence of defined weather events. Go to ukclimateprojections.metoffice.gov.uk and click on User Interface.

Chapter 8.0

8.0 Performance Evaluation

By definition, adapting to climate change involves responding to a continually changing world. This process involves making sure that any new information, methods or priorities are accounted for by monitoring, measuring, analysis and evaluation in order to inform your management review.

Therefore this final process is divided into the following tasks:

Task 12: Monitoring, measurement, analysis and evaluation

Task 13: Management review

Task 12: Monitoring, measurement, analysis and evaluation

(Relevant clause in ISO 22301: 9.1)

Monitor the business impact of weather events, including details of the length of disruption, any associated costs and the effectiveness of any adaptation actions or BC procedures. If possible, highlight any critical thresholds in weather variables, above which the impacts became significant. The template you used in Task 1 (Appendix B) can be used for this on an ongoing basis.

Keep a watching brief on emerging information and guidance, such as from relevant trade associations, professional bodies and advisory groups. For example trade associations may provide information on climate risks and adaptation measures relevant to your particular sector. Similarly, professional bodies and other networks may be a route to finding out how others are approaching this challenge.

Monitor how the context is changing e.g. new suppliers (their locations and capabilities) new equipment or processes or changing business priorities.

Analyse the output from these monitoring activities to see if it has any implications for you BIA, risk assessment, preferred adaptation actions or BC plans and procedures. Identify also, if any opportunities are being created where the business could benefit from adaptation.

Using this guide as a starting point together with other emerging information and guidance, explore what good looks like, bearing in mind that there is not yet enough experience of adapting to climate change to clearly define best practice. Evaluate your approach against this.

Task 13: Management review

(Relevant clause in ISO 22301: 9.3)

The management review of your BCMS may be the point at which you introduce the idea of using it to adapt to climate change by flagging it up as a BCM issue that is not adequately addressed, drawing on the points made in Box 1. This guide can be used in a light touch way to gather the evidence required to achieve this. Refer in particular to Task 3 for guidance on raising awareness.

Subsequent management reviews will use the output of Task 12 to ensure the continuing suitability, adequacy and effectiveness of this element of your BCMS.

Appendix A: Template for planning adaptation processes

Processes	Linked to BCMS process(es)	Linked to other business process(es)	Lead role	Supporting roles	When	Notes
Reviewing the context						
Developing leadership						
Understanding the issue						
Preparing for climate change						
Performance evaluation						

Appendix B: Template for cataloguing past weather events

Business impact	Intermediate impact(s)	Description of weather event	Response
e.g. cost, disruption, lost/ gained sales, change in productivity	e.g. flooding of premises, flooding of local area, damage to assets, water unavailability, uncomfortable/ unsafe working conditions	e.g. heavy rain, storm, heatwave, high winds, drought (include threshold if possible)	i.e. the BC procedures that were deployed

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The Climate Ready Support Service provides support and guidance to organizations on managing their climate risks and can be contacted at climatechange@environment-agency.gov.uk

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