iema
Institute of Environmental Management & Assessment

CLIMATE CHANGE ADAPTATION BUILDING THE BUSINESS CASE

GUIDANCE FOR ENVIRONMENT AND SUSTAINABILITY PRACTITIONERS

Department for Environment Food & Rural Affairs

Environment Agency

STRUCTURE OF THIS GUIDANCE

1.1) INTRODUCTION

This guidance has been compiled by IEMA for environment and sustainability professionals.
It has been informed by direct experience from practitioners within organisations who have worked on adaptation and resilience to climate change and extreme weather. Its aim is to present learning points from practice and guidance that will help the reader identify and build support for effective business cases. It complements existing and developing guidance from Defra, UKCIP, IEMA , the Environment Agency and others (see Annex 3 for references to further guidance)

1.2) SOME KEY PRINCIPLES IN BUILDING YOUR BUSINESS CASE

In many instances the 'business case' for climate change adaptation is not straightforward and can be challenging, especially in determining longer term impacts and considering uncertainties. However, progress is being achieved by practitioners and a number of common learning points have been identified with a full list provided in table 3:

- Understand your business - essential starting point (see section 3)
- Engage widely across your business - build awareness - seek interest and share the challenge - use business relevant language
- Don't reinvent the wheel - use existing decision making opportunities (can mean multiple business cases)
- Look for opportunities on the back of other projects and developments - 'piggy back'
- Use recent and future weather impacts as an early opportunity for business response (this can also help in building awareness for longer term climate change adaptation)
- In addition to risk, do consider opportunities and dependencies, including competitive advantage from increased resilience to extreme weather and climate
- Look for 'early mover' opportunities - do not under estimate the value of making a start (for example through trial schemes or by adaptation linked to wider initiatives)

Practitioner experience indicates a varied landscape with climate change adaptation being addressed within and across a range of ongoing business decisions. Landmark business cases are relatively rare at this time, but incremental progress is being achieved with businesses responding to risks and opportunities (for example additional measures and design considerations in projects and developments).

This 'building' approach of integrating resilience to extreme weather risks and climate opportunities is helping to raise awareness within organisations, to achieve early progress and can also help bring adaptation into future mainstream business considerations (including the challenging area of longer term business decisions).

1.3) TERMS AND LANGUAGE

This guidance makes frequent use of several key terms (full list at Annex 4)

• Adaptation - Adjustment in natural or human systems (including businesses) in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

• Resilience - Ability of a system and its component parts (e.g. a business) to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

• Dependency - 'Environmental dependency' is a term which can be applied to a company's operations and activities (direct or indirect) which are significantly dependent upon the state of the environment and the services it is providing (including weather and climate)

Although these terms are used throughout this guidance, it should be reiterated that the use of 'business language' is critical in building a business case (see section 3)

1.4) CORPORATE DEPENDENCY ON ENVIRONMENT AND CLIMATE

Corporate approaches to the environment are changing with increased realisation of business critical dependencies. The imperative to reduce business environmental impact continues but is accompanied by growing appreciation of the direct economic value of the natural environment and our need for resilience to the changing climate. Business concerns can already be seen over supplies of economically critical resources such as rare metals, water scarcity and continuity and affordability of energy supplies. Awareness of business vulnerabilities to climate and extreme weather further overlay these concerns. Recent reports from businesses and Government identify this increasing awareness of a critical interdependence between business and the environment:

"A healthy properly functioning natural environment is the foundation of sustained economic growth…" - Natural Environment White Paper - Defra 2011[1]

"Tackling climate change means using energy more efficently, future-proofing businesses against climate threats and moving business operations towards carbon neutrality"- CBI Web Page 2013

"The climate is fundamental to almost all aspects of our daily lives: it directly effects our economy, ecosystems, food, water, health, homes, infrastructure, trade and leisure." - UK Climate Change Risk Assessment, HM Government - January 2012[2]

"…Businesses are making their companies more resilient, managing risk more effectively, concentrating on the right relationships with customers and suppliers and strengthening their reputations" - Ecosystems Market Task Force - March 2013[3]

1.5) WHY GUIDANCE FOR ENVIRONMENT AND SUSTAINABILITY PRACTITIONERS?

This guidance is specifically aimed at environment and sustainability professionals working within business organisations. It will be of interest to wider situations, but its focus is on practitioners working to ensure their organisation is addressing climate change adaptation.

IEMA believes there is a critically important climate change adaptation role for environment and sustainability professionals in helping businesses understand the range of potential climate impacts and also in working with colleagues across the business to build resilience and potential responses. The IEMA Skills Map[4] sets out a framework for knowledge and skills needed by the environment profession and in doing so highlights critical competencies and requirements that professionals will draw on to deliver progress on climate change adaptation – for example;

- ✓ Environmental and sustainability principles - Understand environmental processes and limits and their impacts on the sustainability of organisations
- ✓ Managing business resilience - identify strategic opportunities and risks to improve business resilience
- ✓ Sustainable practice - Lead projects to deliver environmental performance improvement, making a business case
- ✓ Develop sustainable solutions - Lead organisations to innovate, envision and develop sustainable solutions
- ✓ Lead change - Lead a process of change management overcoming barriers
- ✓ Influence behaviour - Educate, influence persuade and challenge others to lead and promote sustainability
- ✓ Communication - Use communication to drive sustainable business practice - Identify, engage and respond to stakeholder needs

Climate related risks and opportunities can be addressed across a range of business processes from organisational management systems, supply chains and procurement, through to sales, service delivery and product design. Climate change adaptation is an opportunity for environment and sustainability professionals to engage with key managers across the business on critical challenges (working with colleagues across risk management, business continuity, quality management, health and safety, human resources, facilities and operations, finance, marketing and product development).

1.6) HOW HAS THIS GUIDANCE DEVELOPED?

The following guidance captures the experience of environment and sustainability professionals in practice (280 engaged at different stages). In early 2013, IEMA ran two workshops with 40 active business professionals, to understand key learning points for effective action on climate change adaptation. These were followed with a webinar to present and discuss early findings and individual telephone interviews to explore issues in more detail. Through this process a fuller understanding was developed of key challenges faced by practitioners, the importance of their role and the key ingredients for progressing an effective business case on climate change adaptation. Further information on this process and participant's roles and experience are outlined in Annex 2.

1 Defra Natural Environment White Paper - ClimateChangeAdaptation001
2 UK Climate Change Risk Assessment - ClimateChangeAdaptation002
3 Final report - 'business led' Ecosystems Market Task Force - ClimateChangeAdaptation003
4 Extracted from IEMA skills map – framework for the knowledge and skills needed by the environment profession ClimateChangeAdaptation004

2) WHY CLIMATE CHANGE ADAPTATION IS IMPORTANT TO BUSINESSES

Climate change is widely accepted as a scientific reality and increasingly as a material business consideration. The scientific consensus and projections are overwhelming and a step change is required if we are to meet necessary reduction targets for avoiding dangerous climate change[5]. In a business and economy context, focus has moved to business realities such as: reducing energy costs, complying with climate legislation, improving performance, increasing business resilience, building corporate reputation and meeting contractual and stakeholder expectations.

Significant work has been undertaken for categorizing and considering business relevant climate change risks and opportunities. Some well used approaches are summarized overleaf. Following this a 'practice derived outline' is compiled at Table 1 including business dependencies and progress examples from practitioner experience.

2.1) BACKGROUND ON CLIMATE CHANGE RISK AND OPPORTUNITY

UKCIP have set out six categories for the impacts of weather and climate on businesses listed below from their Business Areas Climate Impacts Assessment Tool (BACLIAT):

• Changing markets - impacts on demand for goods and services (can also be positive)

• Business logistics - disruption to supply chains, utilities and transport

• Business premises - impacts on buildings and sites (temperature, flooding)

• People - impacts on employees and customers (heat, cold, extreme weather)

• Industrial processes - especially if temperature and weather sensitive

• Company finances - losses through disruption, insurance costs, etc

A further approach uses the concept of direct and indirect risk. Direct risk impacts can be seen as damage to physical assets, disruption to business from extreme weather, water scarcity as a direct resource, unsafe weather conditions for staff working outdoors etc. Indirect risks include disruption of supply chains, rising insurance costs, etc. In certain situations this categorization may not meet business experience with some 'indirect' risks feeling very tangible and close (e.g. a supply chain disruption directly affecting current production and near term bottom line).

2.2) PRACTITIONER VIEWS ON CLIMATE RISK AND BUSINESS OPPORTUNITY (DEPENDENCIES)

Through workshops and telephone interviews, IEMA members identified a range of risks and opportunities from climate change and severe weather incidents, as directly relevant for their business. In identifying these practitioners further considered relevance and business 'dependency' (i.e. the reliance of the business on climate). These climate and weather related risks and dependencies are broadly categorized in Table 1.

An important business consideration across climate related risks in Table 1, concerns the company's comparative advantage to its competitors (i.e. considering action against climate risks as opportunity for increased resilience and consequent business advantage). Some practitioners felt valuing this dependency might support positive business case evaluation for adaptive action on climate change.

Examples from practitioners help to understand how climate risks can be seen as a demonstration of dependency (and in turn how adaptive action might be viewed as an opportunity for comparative business advantage).

- One medium sized company decided to internalise (own and manage) delivery logistics in order to better ensure continuity of service to customers. The company also ensured sufficient 'held stock', for a continuity of supply out to its critical and valued clients. This approach is seen by the company as providing comparative advantage over competitors who operate more mainstream 'just in time' systems for outward deliveries and internal supplies (an approach seen by the adapted company as being increasingly vulnerable to extreme weather incidents both in the UK and also in its international supply chain).

- An alternative corporate approach on supply chain concerns has been to secure resilience and continuity by diversifying suppliers and building in contingency (this approach from a large corporate with international production and sales).

- A further large corporate had addressed risks through a significantly localised supply chain where its suppliers effectively guarantee delivery (i.e. responsibility for contingency in this case put on to the supplier).

The potential for an increased business advantage through planned resilience and adaptive action is an important consideration to include within the business case. Consider also the interconnections between differing climate risks and dependencies of your organisation as discussed in Table 1 (an example being damage to corporate reputation which in turn can influence or delay consents as well as negatively effecting client work and overall profitability).

TABLE 1 - TYPICAL BUSINESS RELEVANT CLIMATE RISKS AND DEPENDENCIES (FROM PRACTICE)

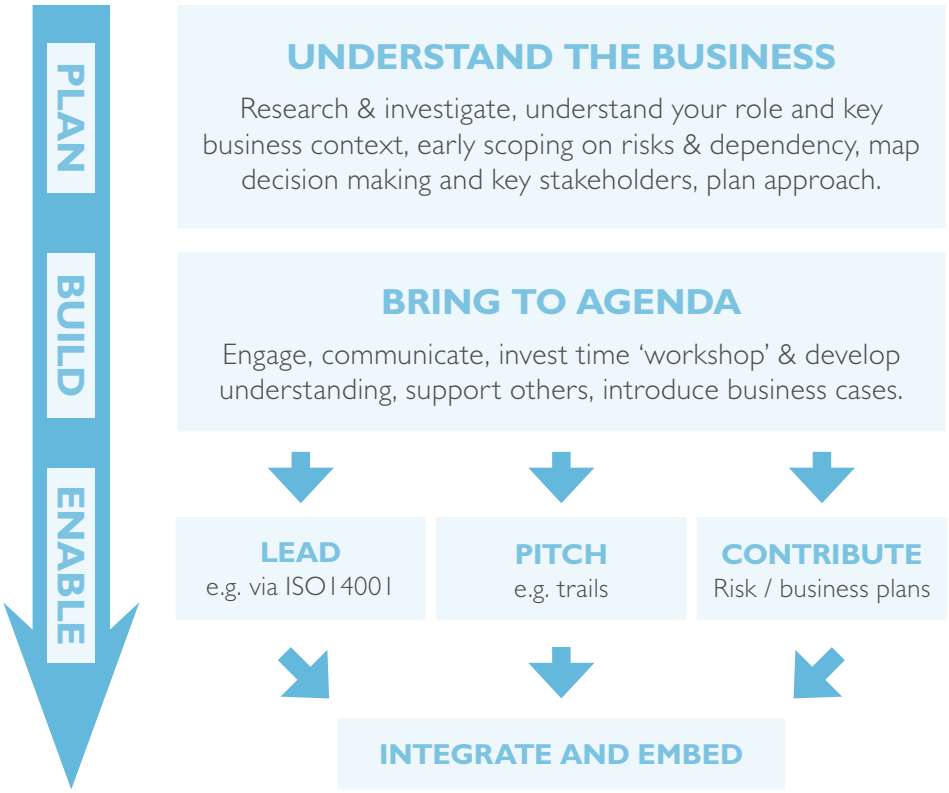
BUSINESS RELEVANCE	CLIMATE DEPENDENCY FOR THE BUSINESS (mostly seen as risk)	RESPONSE EXAMPLES (direct or comparative opportunities)
PROFITS (direct or near term)	- Disruption of operations on site (flood, frost, etc) - Weather disruption of both supplies in and also deliveries out to clients (UK + overseas) - Customers not able to access goods (weather events) - Staff not able to get to work (weather events) - Scarcity & impact on cost of materials, water, energy. - Weather disruption to electricity/fuel supply - Increased insurance costs / access to insurance	- Onsite measures (flood defense, SUDS, reducing water ingress, building design, modifications) - Diversified supply chain (build resilience) - Changes to procurement (contracts, suppliers) - Increased stock holding and/or contingencies - Onsite energy generation (option to include low carbon energy, receive ROCs, sell surplus to grid) - Critical workers policy (remote), and providing flexible work-life balance solutions for staff - Meeting insurer requirements – maintain cover
WINNING BUSINESS (& keeping business)	- Contracted service level requirements on continuous delivery (irrespective of weather) - Client expectations (e.g. seeking adaptation evidence via PQQs and specifications) - increased demand in climate related services and expertise (flood assessments, specialist design, etc)	- Opportunity for business advantage through increased resilience / business continuity Refocus business on opportunities (e.g. direct in new products & services or indirect resilience) - Increase capacity on climate change work (expertise & skills) - Add value for clients (e.g. through creative bids addressing CCA)
REQUIREMENTS (regulators / others)	- Requirements for flood risk assessments & mitigation (planning process, Environment Agency, others) - Increasing contractual requirements from key clients (e.g. Corporate supply chain, Govt & public sector) - Policy and legislation. Currently easing off with removal of National indicators (Nis) and also CCA reporting requirements changing (to voluntary)	- Avoiding delay on consents, helping to ensure business continuity - Business imperative to meet contracts / and opportunity to exceed minimum requirements - Opportunity to build on impetus from the initial reports - NIs (Local Authorities) and CCRA reports (utilities / others)
CORPORATE REPUTATION (& stakeholder expectations)	- Damage to reputation (e.g. media stories on company failure following weather or climate disruption) - Longer term reputation effecting profitability or ability to secure consents and investment - Expectations from key stakeholders, clients and investors (also some corporates have sustainability advisory panels providing 'critical friend' scrutiny)	- Good news stories on local stewardship of environment (UK or overseas) - Reporting on positive climate adaptation approach (in company or sustainability report) - Report to shareholders and institutional investors that risks have been identified and mitigated can help 'leading company' status/ support access to finance and inward investment.
LONGER TERM VALUE	- Existing estate/asset value effected by climate change (e.g. reduced value / potential of sites that will be at increased future risk) - Acquisitions of other businesses and capital need to factor longer term risk (long term climate projections) - May impact regulator views in future (e.g. whether the site is safe to operate if it posses a pollution risk)	- Proactive flood and climate risk assessments - Targeted measures on risks - Incorporate and address climate change risk within due diligence processes - Opportunity to demonstrate preparedness and achieve recognition - 'license to operate'

3) BUILDING SUPPORT FOR ADAPTATION AND DEVELOPING THE 'BUSINESS CASE'

The following sections provide guidance for environment and sustainability practitioners on building support and making progress on decision making and the business case. It aims to be complementary to existing and developing guidance (see Annex 3 for further references)

The diagram below (Fig 1) outlines three key stages that Practitioners have worked through in building and securing support within businesses for climate change adaptation and resilience to extreme weather risks. The first phase can be a quite lengthy 'planning' period that is building critical knowledge and understanding. The middle 'building' phase takes this understanding forward into the business, testing initial concepts, learning from feedback and developing the business case. In the third 'enabling' phase, direct climate change adaptation business decisions are being made often through existing internal processes (e.g. management systems, annual business planning, corporate response to risk registers etc). The following sections work through these phases in building and advancing the business case for climate change adaptation (references also provided to further guidance sources[6])

FIGURE 1 - CLIMATE CHANGE ADAPTATION - DECISION MAKING & THE BUSINESS CASE



NOTE - Figure 1 above sets out a conceptual approach to building internal awareness and support for action on climate change adaptation. The approach in practice is acknowledged to include cyclical loops back into decision making (i.e. within the 'integrate and embed' stage there is review leading through to further business cases). For complementary change management approaches see also the cycle of planned change (Fig 6.1 in Change Management for Sustainable Development[6]).

3.1) PLANNING FOR CLIMATE CHANGE ADAPTATION

Practitioners who have advanced adaptation business cases are clear about the importance of initial planning. Key approaches and learning points are summarized below;

3.1.1) FIRST UNDERSTAND YOUR COMPANY (CULTURE AND APPROACH)

A clear understanding of your company's approach to risk, decision making and the environment is essential, along with its overall approach to business, central values and core business rationale. Any case for climate change adaptation will only work if business relevance is clear to key decision makers. Practitioners identify that knowledge of how your business functions, drivers, challenges, barriers (i.e. what makes it tick) is "at least as important" as knowledge on climate change scenarios and projections.

An understanding of the company's approach to change[7] is also important in planning any business case or new approach on adaptation. Think about how the business has changed in recent history and responded to other agendas and if these experiences provide any direct learning points. Draw on your own and also colleagues experiences to build this understanding. Some useful prompts to consider include:

- What is your organization about - What is it 'for'?
- What changed in the past and what is changing now?
- What else is on the horizon - next 3-5 years? Longer term?
- What drove earlier change? What enabled or made change easier?
- Has climate or weather affected the business in the past?
- How does your organization deal with other risks?
- How is your organization inter-connected with others, and do we know what is driving change in their sector/organization?

6 IEMA Practitioner publications provide further supporting information and are referenced in places;
Volume 8 - Change Management for Sustainable Development: a workbook (2006)
Volume 13 - Adapting to Climate Change: a guide to its management in organisations (2009).

3.1.2) YOUR ROLE AND REMIT ON CLIMATE CHANGE ADAPTATION

It is important to consider your role, remit and mandate for change at an early stage. Practitioners from a range of business positions have contributed to this guidance from sustainability and environmental management roles within businesses through to practitioners with specialist roles (for example expertise on flood risk assessments or adaptive design).

Table 2 captures some of these roles simplifying to generic examples. It also presents a summary of decision opportunities often (typically) available to practitioners in these positions. Each situation will differ but a useful starting point is to consider your role and remit and also your company situation relative to the profiles set out in Table 2.

TABLE 2 – PRACTITIONER EXPERIENCE - PROGRESS ON CLIMATE CHANGE ADAPTATION
(PROFILES COMPILED FROM TELEPHONE INTERVIEWS - FEBRUARY 2013)

TYPICAL PRACTITIONER ROLE AND COMPANY	DECISION MAKING & INFLUENCE OPPORTUNITIES (EXAMPLES)	PROGRESS ACHIEVED IN THE BUSINESS (EXAMPLES)
HEAD OF SUSTAINABILITY OR ENVIRONMENT FOR A LARGE COMPANY (e.g. a multi-site complex corporate)	- Corporate sustainability strategy, EMS, audits and internal working groups - Updates to risk register (contributory) - Others' business planning (influence) - Investments / projects (influence) - purchasing and supply - Stakeholder advisory groups - Communications and annual reports	- Material climate risks mitigated and monitored (via risk register) -Supply chain resilience (e.g. diverse source, local supply, efficiencies) - Headline sustainability initiatives at key sites (adaptation part of rationale) - Commitment and progress reported - Sharing best practice across divisions or Subsidiaries in the wider Group.
ENVIRONMENT MANAGER OR OFFICER WITHIN A MEDIUM TO LARGE BUSINESS (a 'threshold' business supplying in to others - some complexity)	- EMS procedures, audit & continuous improvement process (e.g.ISO14001) - Addressing client requirements as part of the supply chain (support others) - Multi-team groups / green champions - Risk & business continuity (generally less than within larger corporates but scope for input) - Other requirements (e.g. regulator) - Purchasing (support others / trials)	- Flood risk assessments across critical business units / sites - On site measures to increase resilience and continuity (e.g. flood protection, diversified supply and efficiency) - Trial schemes and approaches - Climate change risks managed within the EMS (e.g. in aspects register and with specific procedures)
CONSULTANT OR ADVISOR IN BUSINESS FOCUSED ON SERVICES TO CLIENTS (specialist or physical services)	- Main opportunities are in addressing PQQ bid requirements and building CCA in proposals to clients - Internally EMS, risk and business continuity approaches provide some scope	- Increased income from specialist services related to climate change adaptation - Some examples of re-focusing on climate change services as core business model

7 Further guidance is available in Practitioner Volume 8 (section 2.23 change and your organisation). Also in Practitioner volume 13 (section 2 - managing the process)

3.1.3) CLIMATE RISKS AND OPPORTUNITIES FOR YOUR BUSINESS

Section 2 provided an overview of typical climate related business risks as well as a practitioner informed understanding of business dependency upon climate and weather. Although some sectors have started to develop identified risk profiles (outlining the commonality in that sector) the specific risks, opportunities and dependencies will often vary between individual businesses (mirroring the unique position, history and complexity of companies). As a rule, most large businesses (above 250 employees) will benefit from a tailored scoping exercise relative to their current business model and also to any planned future business direction.

This process of scoping risks and dependencies specific to the business, can be a valuable opportunity to engage colleagues and to start building internal interest and capacity on climate change adaptation. It is likely to be an exercise that is revisited or redone at different stages -e.g. in close small group at planning stage and more fully later as an engagement opportunity when building support and commitment to action (see 3.2).

3.1.4) MAP INTERNAL STAKEHOLDERS AND DECISION MAKING

Stakeholder mapping along with related decision making opportunities can be particularly valuable in early business case planning. Decision making activities do not rest entirely with the Board (or its equivalent) and it is important to understand, scope, or map where decisions are made across the organization. Examples of some successfully used business processes that include (or lead to) decision making are in section 3.3 and also in Table 2.

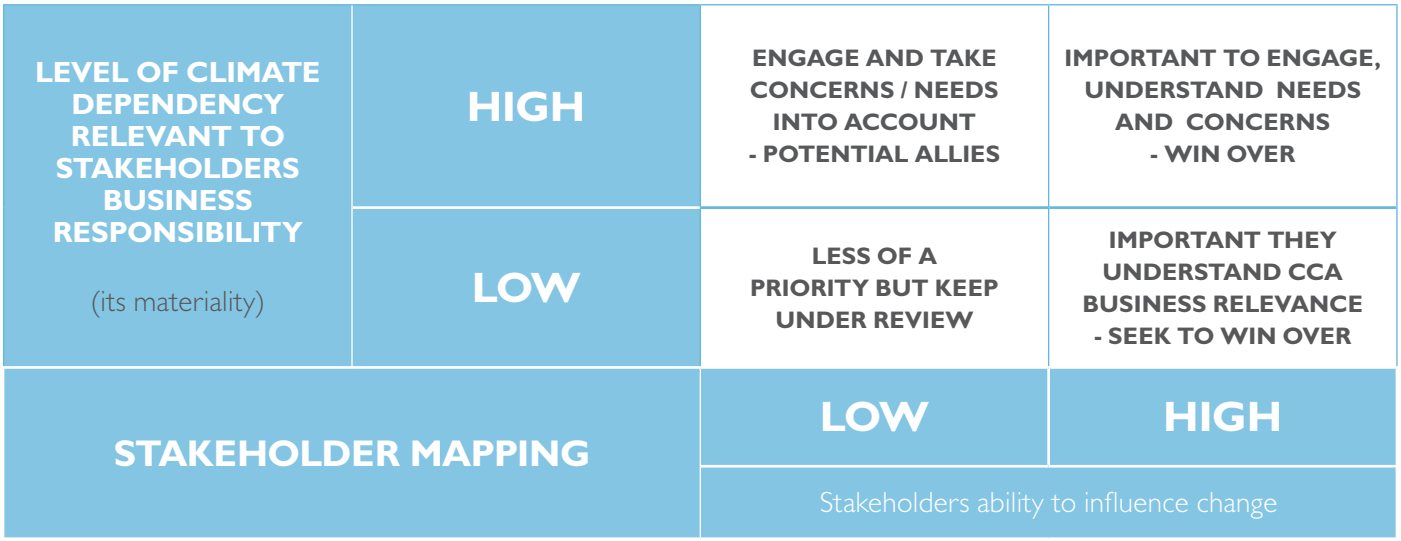
A critical supporting measure, and sometimes route to decision making, is to consider individuals across the organization who also have a stake in adaptive action (i.e. who is responsible for business elements that have the greatest levels of climate dependency). Potentially these are colleagues who may support the business benefit, influence a future decision or both. A simple framework for considering stakeholders is outlined below:

Whether or not you directly use a stakeholder mapping approach, a critical process is to consider your internal stakeholders and make an initial judgment around their business dependency, attitude towards climate change adaptation and also how important it is for you to involve them (and how).

Finally, as you progress to communicate and engage (section 3.2 overleaf) you may find that some internal stakeholders wish to take ownership of the issue and directly advance adaptation / resilience measures. This should be a good result. Environment and sustainability practitioners are often catalysts prompting others and then working to support colleagues with their direct response / business case.

NOTE - external stakeholders should also be considered (not necessarily mapped). Working in partnership can be an effective approach to achieving progress on climate change adaptation. Consider potential to engage with others, particularly if there is a shared risk (e.g. suppliers/ customers/ neighbours) or knowledge that can be shared (e.g. through your own supply chain or with clients and customers).

FIG 2 – STAKEHOLDER MAPPING (ADAPTED FROM IEMA PRACTITIONER VOLUME 8)



3.2) BUILDING THE CASE – BRINGING TO THE AGENDA

The building phase of Fig: 1 (second stage) indicates a development period with practitioners working to build internal awareness of climate dependencies. Effective engagement and communication processes will be central in awareness raising and winning interest and support for adaptive action. The process can move towards a specific business case at corporate level but in practice this is rare. More commonly the outcome is towards multiple decision points (or business cases) across a number of internal decision making opportunities.

Most practitioners contributing to this guidance indicated they had sufficient mandate (see 3.1.2) to commence internal communications on climate change adaptation. For example some had a direct requirement to investigate and address business critical environmental issues. Others had responsibilities such as internal EMS (e.g. ISO14001) which sufficiently led through to considerations on climate change adaptation. However some could not advance without a specific authorisation from Board, CEO or responsible director. In this situation, an initial business case can be needed. Practitioners generally felt that if this was required, it should be concise and single focused on consent to undertake an initial scoping exercise with critical colleagues (i.e. working across teams to investigate risks, opportunities and dependencies and to report back with initial recommendations).

In making progress by engaging internal stakeholders many practitioners commented on the value of active workshop approaches to draw out critical climate dependencies for the business. This could be within a central scoping approach leading to a report back (e.g. to Directors) or as part of a broader strategic environment or sustainability strategy, building on gap analysis or seeking to address wider corporate objectives on sustainable business.

Another approach was adding 'climate change business risks' as an agenda item to management meetings at departmental / business unit level (i.e. to physically meet dispersed teams, place on their agenda and raise the issue in their future business planning).

Some senior professionals were further able to directly challenge future business plans across the Group (for example some companies will 'workshop' their separate business plans to critically test their sustainability and resilience).

The landscape is clearly varied and practitioners need to identify and use their best available opportunities for engagement. Experience indicates that progress can require significant investment in time and effort, and in communicating to 'share adaptation' as a critical business issue. A number of key business case and engagement learning points have been identified by Practitioners and are presented in Table 3 (along with further guidance below).

3.3) ENABLING CHANGE - DECISION MAKING

Within the 'enabling' phase of Fig 1 (third stage) business cases are being made across a number of decision points within the organization and potentially by a number of internal personnel (i.e. by practitioners but also by engaged colleagues across different teams). A number of business processes with direct or related decision points exist, for example:

- Internal approaches to Risk Management
- Systems for business continuity
- Environmental management systems[8]
- Other management systems (e.g. IMS, Quality)
- Annual or other business planning
- Procurement, specifications, tenders
- Staff engagement programmes
- Supply chain management
- Capital expenditure (CAPEX)
- Company mergers, acquisitions, disposals (including reviews and due diligence)
- Corporate strategy programmes (with sustainability or other vision statement)
- Gated project management and finance controls (e.g. PRINCE 2)

Practitioners also identified supporting tools, processes and opportunities such as:

- Corporate level public reports
- Cost benefit analysis
- Environmental Impact Assessment
- Flood Risk Assessment
- Life Cycle Assessment (and conceptual lifecycle thinking)
- Training for general awareness or for specialist support internally (e.g. FRA)
- Building modeling techniques (e.g. BIM)
- MET Office Publications, scenario modeling
- Talking with suppliers and reviewing publications produced by utilities etc
- Contracted specialist support

Feedback from practice is that individual business cases for Climate Change Adaptation are rare and that many business cases securing change are often undertaken within and across a range of mainstream processes (some as outlined above).

As an example, direct business adaptation is arising through 'mitigating actions' to issues raised through corporate or departmental risk management. Environment and sustainability professionals contribute to these processes and can provide critical advice on climate change impacts and risks and also on solutions. In some instances Climate Change will appear on the corporate risk register but often it may be the associated risks appearing (e.g. flooding, extreme weather incidents, water stress / scarcity etc). Some practitioners identified limitations through this process such as the high materiality threshold often required for any response. Some suggested that mainstream business planning and other decision making opportunities be used as opportunities to more effectively allow consideration of business dependencies and any associated commercial advantage.

A further example is the use of environmental management systems (EMS) such as ISO14001. Environment and sustainability professionals are instrumental to effective EMS and well placed to use these systems to address climate change adaptation. In many situations EMS is used to only address impacts from the businesses on the

8 Further guidance on the use of EMS for adaptation is in - 1) IEMA Practitioner Volume 13 (appendix) and also (with wider systems guidance) in 2) BSi publication - Adapting to climate risks using ISO 9001, ISO 14001, BS 25999 and BS 31100 (2011)

9 At time of writing IEMA is working to influence the revision of ISO14001 - seeking to further support the developing practice of using EMS to manage environmental risks and impacts upon organisations

environment, but practice is developing. Environmental aspects registers have been used to identify critical interactions with both climate change (strategically) and more specifically for weather and climate impacts on businesses (flooding, drought, water stress etc)[9]. Within its context of continual improvement, practitioners have used EMS to develop business responses to past weather events and disruption and also in response to concerns raised via regulators and external auditors. EMS procedures have been developed to address climate related impacts such as increased flood risk. Some practitioners have further addressed climate risks under the ISO14001 emergency response clause. Business cases are made within EMS to evidence risks, costs and opportunities and these management systems are being used by practitioners for both proactive and responsive adaptation by organisations.

...Clearly there are a range of business processes and associated decision opportunities that practitioners and businesses can utilise. Furthermore, it is clear that climate change adaptation can also be addressed as 'additional consideration' in broader business cases (supporting, overlapping or 'piggybacking' on wider decisions). As an example resilience considerations around the business case for flexible and remote on-line working can be supported by information and projections on future weather events and climate. Supply chain management can similarly address adaptation and climate resilience alongside wider business critical issues (i.e. linking with other sustainability issues such as resource availability and embodied carbon).

Establishing quantified costs and benefits for a climate change adaptation business case is challenging but important to include where information can be developed. Some strategic and macro level information on the costs and benefits of adaptation is available (annex 3). However, most relevant will be cost / benefit data developed within companies themselves. Some practitioners are working to probabilistic assessments of future impacts based on historic events (e.g. extrapolating from business experience on the costs of lost production on site due to severe weather, or from lost sales through weather disrupted supply chains). Within these approaches the internal team can be helpful in critically assessing the future options and projections, providing business experience / informed (qualitative) contribution.

In relation to any financial investment business case, practitioners will need to identify the company's approach, criteria and principles regarding returns on investment (ROI) and on capital expenditures (CAPEX). It will be important to understand considerations of asset life and depreciation costs for aspects of the business being considered (i.e. the elements at risk or presented as opportunities). Legislative considerations can influence some adaptation business investment decisions (e.g. regulator concerns over flooding and associated pollution incidents). Adaptation measures can be integrated into a wider project that is influenced by other Government policies, such as integrating climate considerations into building design heating / cooling requirements where a carbon policy driver exists (e.g. carbon price allowance 'incentives' from the CRC Scheme or 'zero carbon' building regulations).

Practice indicates that adaptation cost / benefit estimates are only occasionally developed and most business decisions are made on best available information (e.g. mixture of some quantification alongside climate projections and balanced against business experience / judgment). It is clearly helpful to incorporate costs and benefits where these can be identified and consider in relation to climate projections and respective levels of certainty. This is a developmental area of practice and further guidance on business costs and benefits is being issued by the Environment Agency in late 2013 (see Annex 3).

It is clear that businesses are starting to recognise climate risks and are open to measures that will increase resilience. Longer term planning and response remains a significant challenge for most (exceptions being within utility sectors, infrastructure companies and to an extent some property businesses). However, although many struggle with considering timescales to 2030 and beyond, current vulnerabilities to extreme weather do provide a focus which a) can catalyze early response on resilience and b) can support the longer term business case.

- Table 3 overleaf sets out key principles for developing business cases on climate change adaptation.
- Annex 1 further provides an example framework for a high level business case - this is provided as a prompt only for business case considerations (please note practitioners are advised to always tailor specific business cases to their own organisations requirements)

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TABLE 3 – BUILDING THE ADAPTATION BUSINESS CASE – PRINCIPLES AND LEARNING POINTS

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 critical 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 risks, opportunities and dependencies.
Use business relevant language	In discussions either avoid terms like 'adaptation' or be careful to consistently translate. Use business language - profitability, disruption, staff welfare, client and customer service, liabilities, added value, winning business, loss of reputation, insurance costs, changing asset value, and constraints on 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 Advisory committee 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 as basis for more credible projection 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 existing business processes where they offer scope for action on climate change adaptation (e.g. procurement, risk management and business continuity, environmental management system, 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 (see section 2.2).
Try things out	Do not under-estimate the importance of making a start. Trialing solutions on site with willing colleagues or business partners can be an important first step (demonstrators)

ANNEX 1

HIGH LEVEL BUSINESS CASE - EXAMPLE FRAMEWORK

IMPORTANT - The following is indicative only with considerations for how a high level business case might be structured on Climate Change Adaptation. It is deliberately in outline with prompts for consideration. No single framework can be advanced and all situations require tailored approach (research other recent approaches in your organisation). Any written case is final stage of a well-planned process, should be tested in advance and some support should exist (have been developed). The case must fit intended audience - the following assumes high level decision makers with full agenda.

OUR ADVANTAGE FROM CLIMATE CHANGE & SEVERE WEATHER

(bold title if convincing case - test it / don't fall at first hurdle)

1. Purpose of report

- concise description, issues for consideration and the decision you are seeking

- Short description of process leading to report (where this has come from / why)

- Other up front considerations? - (e.g. you might clarify 'adaptation' if confusion is likely with other recent 'climate' report however don't add / make confusion)

2. Brief facts on changing climate & weather

- Keep brief but make your point (range of sources available – refer to / use official and authoritative data and projections - Defra / Met Office / EA). ONLY if required address climate sceptics. As far as possible work on climate change as accepted fact and refer to robust projections now available (albeit with uncertainties and ranges). Remind them of any relevant organisational commitments...

- Keep relevant to weather and climate effecting the business and avoid clutter (such as facts / details outside of operating regions and not relevant to business processes / products)

- Ensure your information supports 3/4 below (same point)

- If helpful mention any particularly strong recent impacts on the business or on competitors (helpful to make this connection but don't over state)

3. Key climate risks and opportunities for our business (try wording in positive)

- Intro on process to evaluate these risks (be brief but also transparent)

- If not addressed in 2, commence with recent weather events that impacted on the business

- List business relevant climate and weather risks /opportunities you and colleagues have identified (short list only - full can be provided as annex / or state available on request)

- If helpful present summary 'heat map' from deep red as risk through to deep green as opportunity - (However absolutely keep simple and strategic/ don't add distractions and only use tested materials - This may be better as annex if at all)

- Evidence your short list to direct business relevance - use estimated costs / benefits if possible (isn't always). Be transparent on assumptions. Do use convincing qualitative evidence such as, internal opinions sought and secured on any relative business advantage from improved resilience (direct experience within business + information on competitors.)

- If supported - present and evidence risks as opportunities for business advantage

4. Decision required/ recommendations (ensure all have some support / will at least maintain progress)

- Agreement that further investigative work be undertaken on 'short list' (options)?

OR

- Specific adaptation / resilience options to be costed for identified risk / opportunities?

OR

- Trial project required at one site / region?

- Try to include recommendation for longer term (investigative of opportunity / risk)

ANNEX 2

SUMMARY INFORMATION ON IEMA PRACTITIONER ENGAGEMENT

In early 2013, IEMA ran an engagement programme with environment and sustainability professionals (around 280 IEMA members) to inform development of this guidance. This included 2 workshops attended by 40 practitioners, a webinar by 247 and 15 telephone interviews to explore issues in further depth. A further presentation was given to a business climate change adaptation event held by Sustainability East.

The guidance has been informed through this process, in particular through workshops and telephone interviews that allowed experience to be discussed in detail. Those sessions were deliberately held under a 'Chatham house' approach in order to enable open discussion of internal decision making

Feedback responses following the webinar provide an indication on climate change adaptation roles of practitioners and their business situation. 73% indicated they were operating in the private sector and in relation to company size the breakdown was;

RESPONSE OPTIONS	PERCENT
Sole Trader	7%
Micro (10 employees of fewer)	8%
Small (between 10 and 50 employees)	8%
Medium (between 50 and 250 employees)	17%
Large (more than 250 employees)	60%

In relation to practitioner roles 43% were working internally on climate change adaptation in relation to the organisations own climate change dependencies. A further 21% were operating in what may be described as an external facing context (i.e. delivering consultancy services or developing new services and products). The breakdown is outlined below.

RESPONSE OPTIONS *247 ATTENDED - SURVEY RESPONSE = 94	%
Leading a corporate process (e.g. environment or sustainability) where Climate Change Adaptation is specifically included and progress is being achieved	7
Seeking to achieve organisational progress on Climate Change Adaptation as part of my direct corporate role, but at early stage (e.g. adding into the EMS)	18
Providing specialist input or contribution to other environment or sustainability professionals who lead this agenda	10
Providing specialist input or contribution to others within the business who lead agenda (i.e. from a non-environment role such as risk management or business continuity)	8
Providing specialist contribution as part of consultancy or client based work	14
Developing and leading new services / products on climate change adaptation	7
No specific role or responsibility on Climate Change Adaptation	27
Other	9

ANNEX 3

FURTHER INFORMATION AND GUIDANCE

CLIMATE READY
STARTING POINT FOR ADVICE AND INFORMATION

Climate Ready is the UK government's initiative to help businesses, communities and the environment adapt to a changing climate. The Environment Agency provides this support service: ClimateChangeAdaptation006

At time of drafting, the Climate Ready web pages are launched and developing. They include links to critical information such as UK Climate Risk Assessment and UK Climate Projections, guidance from earlier work (e.g. selected CCA tools from UKCIP) and will continue to grow with further helpful guidance and case studies to be added later in 2013 – for example:

- Assessing and managing climate change risks to supply chains – Environment Agency guidance for UK businesses (due Spring 2013)

- Climate Ready / Environment Agency guidance on costing adaptation measures within a business case (due Summer 2013)

Climate Ready will act as a central advice point on climate change adaptation and should be regarded as the most current / updated national information source for practitioners (with many resources from following pages being transferred or linked as appropriate). Climate Ready covers England only, but the products are available for use across UK. Further information in the rest of the UK can be accessed on the following web pages - Welsh Government /Adaptation Scotland / Climate Northern Ireland

UK - Climate Change Risk Assessment (CCRA)
The Government published the UK Climate Change Risk Assessment (CCRA) on 25 January 2012, the first assessment of its kind for the UK and the first in a 5 year cycle. It has reviewed the evidence for over 700 potential impacts of climate change in a UK context. Detailed analysis was undertaken for over 100 of these impacts across 11 key sectors, on the basis of their likelihood, the scale of their potential consequences and the urgency with which action may be needed to address them. Although the primary customer for this work is central Government and Devolved Administrations, the outputs from the CCRA are also of value to other public and private sector organisations (chapter 5 focussing on businesses). - ClimateChangeAdaptation007 In future can be accessed via Climate Ready (also www.Gov.uk)

National Adaptation Programme (NAP)
Defra is responsible for developing a National Adaptation Programme to address the risks set out in the CCRA. The first National Adaptation Programme (NAP) will be published in 2013 and will focus on helping UK businesses, local authorities and civil society to become more resilient or 'Climate Ready' to climate change impacts. The NAP is being established through a co-creation process with many organisations (including IEMA) contributing: ClimateChangeAdaptation008

The Economics of Climate Resilience
Published in March 2013, and feeding in to the developing UK National Adaptation Programme, this report develops an economic framework to assess the case for adaptation in the UK. It includes a sub report on Business and Services - Economics of Climate Resilience

UK Climate Projections
These are government funded probabilistic projections (2009) from an innovative modelling approach by the Met Office Hadley Centre climate model. Provide projections of climate change and absolute future climate for -

- Annual, seasonal and monthly climate averages.

- Individual 25 km grid squares squares, and for pre-defined aggregated areas

- Seven 30 year time periods.

- Three emission scenarios.

Projections based on change relative to a 1961-1990 baseline - ClimateChangeAdaptation009

UKCIP - UKCIP (UK Climate Impacts Programme) supports adaptation to the unavoidable impacts of a changing climate. They also coordinate and influence research. Many UKCIP tools are now available directly on the Climate Ready web pages including the Adaptation Wizard, BACLIAT, CLARA, Identifying Adaptation Options and Adaptation Monitoring and Evaluation.

Met Office - UK's national weather service - ClimateChangeAdaptation010 - Can also provide services and detailed information to businesses.

Committee on Climate Change - Source of independent, evidence-based advice to the UK Government and Parliament - ClimateChangeAdaptation011

BSi - British Standards Institution - ClimateChangeAdaptation012 - Can supply standards referenced in this guidance such as ISO14001. Also BSi guidance publication - Adapting to climate risks using ISO 9001, ISO 14001, BS 25999 and BS 31100 (2011)

IEMA - Institute of Environmental Management and Assessment. Information available on climate change policy and practice at - ClimateChangeAdaptation013 - Practitioner volumes referenced in this guidance available at - ClimateChangeAdaptation014

Defra - Defra web site will move to www.Gov.UK on 10th April 2013. Important CCA information from Defra can be accessed via Climate Ready and all past information will also be accessible through National Archives - ClimateChangeAdaptation015

Climate UK - A not-for-profit Community of Interest Company working with Climate Change Partnerships across England, Wales, Scotland and Northern Ireland to promote action on climate change. ClimateChangeAdaptation016

ANNEX 4

GLOSSARY - DEFINITIONS AND ABBREVIATIONS

TERM	DEFINITION
Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished.
Climate	Average weather over a period of time, usually 30 years. (UKCIP 2013).
Climate change	Any change in climate over time, whether due to natural variability or as a result of human activity. (IPCC 2001).
Climate change adaptation	In human systems, the process of adjustment to actual or expected climate and its effects in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate (IPCC 2012).
Climate change risk	Additional risk to investments (such as buildings and infrastructure) and actions, from potential climate change impacts. (UKCIP 2013).
Dependency	'Environmental dependency' is a term which can be applied to a company's operations and activities (direct or indirect) which are significantly dependent upon the state of the environment and the services it is providing, including weather and climate (IEMA 2013)
Materiality	Term within business reporting relating to significance of an amount, transaction, or discrepancy (and considered in relation to its impact, influence, value and context).
Resilience	The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions. (IPCC 2012).
Supply chain	The supply chain conceptually covers the entire physical process from ordering and obtaining the raw materials through all process steps until the finished product reaches the end consumer. Most supply chains consist of many separate companies, each linked by virtue of their part in satisfying the specific need of the end consumer. (CIPS 2013).
Vulnerability	The propensity or predisposition to be adversely affected. (IPCC 2012).

ABBREVIATIONS

BACLIAT	Business Areas Climate Impacts Assessment Tool (a tool developed by UKCIP)
BIM	Building information modelling
BSi	British Standards Institution
CIPS	Chartered Institute of Purchasing and Supply
CAPEX	Capital Expenditure Process
CBI	The Confederation of British Industry
CCA	Climate Change Adaptation
CCRA	Climate Change Risk Assessment
CEO	Chief Executive Officer
CRC	Carbon Reduction Commitment (Energy Efficiency Scheme)
Defra	Department for Environment, Food and Rural Affairs
EA	The Environment Agency
EIA	Environmental Impact Assessment
EMS	Environmental Management System
FRA	Flood Risk Assessment
IEMA	Institute of Environmental Management and Assessment
IMS	Integrated Management System
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
NI	National Indicator (a former CCA reporting requirement upon Local Authorities)
PQQ	Pre-Qualification Questionnaire (used to help identify potential capable suppliers)
PRINCE 2	Structured Approach to Project Management
ROI	Return on Investment
UKCIP	UK Climate Impacts Programme