

Evaluating the risk assessments of Reporting Authorities under the Climate Change Act 2008



Prepared for the Department for Environment, Food and Rural Affairs by Cranfield University

Drew, G.H., Pollard, S.J.T., Rocks, S.A. and Jude, S.R. (2010) Evaluating the risk assessments of Reporting Authorities under the Climate Change Act, 2008, The Collaborative Centre of Excellence for Understanding and Managing Natural and Environmental Risks (Risk Centre), Cranfield University, UK, 35pp.

Research Contractor:

Collaborative Centre of Excellence for Understanding and Managing Natural and Environmental Risks (The Risk Centre),
Sustainable Systems Department, School of Applied Sciences,
Cranfield University, Cranfield,
Bedfordshire, MK43 0AL, UK

Tel: 01234 750111

<http://www.cranfield.ac.uk/sas/risk/index.html>

Contents

Contents	ii
Summary.....	1
1. Introduction	3
1.1. The role of Defra and Government	5
1.2. The role of Cranfield.....	5
1.3. The purpose of the evaluation framework.....	7
1.4. The evaluation framework	8
2. Understanding the eight key attributes.....	15
2.1. Climate change risk assessment is a clear component of corporate risk appraisal (key attribute 1)	15
2.2. Climate change risk assessment enables the Reporting Authority to make evidence based decisions on adapting to climate change (key attribute 2)	16
2.3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies(key attribute 3).....	19
2.4. Climate change risk assessment and adaptation measures explicitly consider uncertainties (key attribute 4).....	20
2.5. Climate change risk assessment generates priorities for action (key attribute 5)	22
2.6. Climate change risk assessment identifies opportunities (where applicable) (key attribute 6) .	23
2.7. Clear demonstration of flexible adaptation measures (key attribute 7)	24
2.8. Monitoring and evaluation of adaptation effectiveness (key attribute 8)	25
3. Key supporting data.....	27
3.1. Defra’s Adapting to Climate Change Programme.....	27
3.2. UK Climate Impacts Programme (UKCIP)	27
3.3. UK Climate Projections (UKCP09).....	27
3.4. Environment Agency Supplementary Guidance.....	28
3.5. Other useful documents.....	29
4. Example of evaluating the risk assessment within an Adaptation Report	30
5. References	33
Annex 1. Reporting Authorities and deadlines for their reports and feedback from Secretary of State	34

Tables

Table 1-1. Timetable for the Adaptation Reporting Power	3
Table 1-2. Organisations involved in the evaluation of the Adaptation Reporting Power Adaptation Reports.	4
Table 1-3. The timetable for the evaluation process.....	6
Table 1-4. Key milestones for Cranfield’s evaluation of the Adaptation Reports.	7
Table 1-5. Attributes and sub-attributes of the evaluation framework and links to the Statutory Guidance.....	11
Table 2-1. Evidence required within the risk assessment for key attribute 1	15
Table 2-2. Evidence required within the risk assessment for key attribute 2	17
Table 2-3. Evidence required within the risk assessment for key attribute 3	19
Table 2-4. Evidence required within the risk assessment for key attribute 4	21
Table 2-5. Evidence required within the risk assessment for key attribute 5	22
Table 2-6. Evidence required within the risk assessment for key attribute 6	23
Table 2-7. Evidence required within the risk assessment for key attribute 7	24
Table 2-8. Evidence required within the risk assessment for key attribute 8	25
Table 4-1. Illustrative evaluation of evidence for key attribute 1 - climate change risk assessment is a clear component of corporate risk appraisal.	30
Table 4-2. Illustrative evaluation for all key attributes.....	32

Figures

Figure 1-1. Illustrative example of the type of 'radar plot' used to communicate the evaluation of two sectors by reference to the eight key attributes. 10

Figure 4-1. Illustrative radar plot presenting the evaluation of the eight key attributes in a graphical format. 32

Summary

This document is an evaluation framework for the risk assessment component of Reporting Authorities' Adaptation Reports required by the Department for Environment, Food and Rural Affairs (Defra) under the Climate Change Act 2008. It is intended to enable Defra to provide constructive advice to Reporting Authorities, when responding to them following the submission of their Adaptation Reports, and will also help Reporting Authorities by highlighting the kind of information that their Adaptation Reports should include.

This document sets out the framework that will be used to evaluate the risk assessments and emphasises:

- The need for the Adaptation Reports to show a robust evidence base, using best available evidence, to support the risk assessments;
- The need for close links between risks that are prioritised for action and the adaptation plan devised to manage them; and
- The implementation of management actions within a Reporting Authority's business that ensure risks (and opportunities) are managed in practice.

This is underpinned by the underlying requirement that climate change impacts are being assessed and prioritised alongside other business risks, and then managed (where appropriate) through the active implementation of adaptation plans that are clearly linked to the risk assessment.

The framework is a qualitative approach to evaluating the risk assessments within the Adaptation Reports and will also allow a synthesis of the strengths and areas for improvement both within and between sectors. Each evaluation will be accompanied by an overall narrative and a summary of aspects of good practice and areas for possible improvement. The intent is to draw out:

- Aspects of good practice for sharing more widely;
- Where Reporting Authorities may need future assistance (e.g. tackling interdependency risks); and
- Possible future research needs.

In addition, the reports from all Reporting Authorities will be used to inform the first UK Climate Change Risk Assessment and the development of the first national adaptation programme starting in 2012.

To assist with the evaluation, eight key 'attributes' have been identified by the Cranfield team which are considered to be the essential components required in the reports of Reporting Authorities. Each of the eight key attributes is consistent with the Government's Statutory Guidance to Reporting Authorities. These are:

1. Climate change risk assessment is a clear component of corporate risk appraisal;
2. Climate change risk assessment enables the Reporting Authority to make evidence based decisions on adapting to climate change;

3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies;
4. Climate change risk assessment and adaptation measures explicitly consider uncertainties;
5. Climate change risk assessment generates priorities for action;
6. Climate change risk assessment identifies opportunities (where applicable);
7. Clear demonstration of flexible adaptation measures; and
8. Monitoring and evaluation of adaptation effectiveness.

The key attributes are broken down into sub-attributes and have been produced by examining the Statutory Guidance, the Climate Change Adaptation Report Direction, and in discussion with the Adapting to Climate Change Programme team within Defra. They are intended to help guide Reporting Authorities structure their submissions to Defra and set out clearly how the Cranfield team will evaluate the risk assessment component of an Adaptation Report. **It is important to note that they are not a means of marking, scoring or otherwise ranking one report against another and that in some cases it may not be possible for Reporting Authorities to meet all of the criteria e.g. because the relevant evidence or thresholds do not currently exist.**

To ensure that the evaluation framework for the risk assessments will work in practice, it will be piloted with the 'benchmarker' Reporting Authorities who will submit Adaptation Reports on 30 September 2010¹. The framework may then be revised by the end of November 2010 to reflect any lessons from this exercise.

All Reporting Authorities will be kept up-to-date with any changes to this framework following the pilot exercise.

¹ Environment Agency, Highways Agency, National Grid, Natural England, Trinity Lighthouse Authority and Network Rail (Network Rail will be submitting the risk assessment part of the Adaptation Report).

1. Introduction

Under the Climate Change Act 2008, the Department for Environment, Food and Rural Affairs (Defra) has the power to require Reporting Authorities (defined as organisations with functions of a public nature and statutory undertakers, such as the Environment Agency, water companies, electricity distributors) to produce Adaptation Reports containing:

- (a) An assessment of the current and predicted impact of climate change in relation to the Reporting Authority’s functions; and
- (b) A statement of the Reporting Authority’s proposals and policies for adapting to climate change in the exercise of its functions and the timescales for introducing those proposals and policies.

The Act also requires Reporting Authorities to have regard to their reports (Section 63). This requirement is referred to as the Adaptation Reporting Power.

The Adaptation Reporting Power is an important lever for the cross-Government Adapting to Climate Change Programme as it will help to identify:

- The key risks associated with climate change to key bodies;
- Any gaps in information; and
- Priority areas for future work.

The strategy for using the Adaptation Reporting Power was laid before Parliament in November 2009, with priority Reporting Authorities being directed to report under the first round of the Adaptation Reporting Power between February and March 2010. The reports from these Reporting Authorities will be submitted to Defra between September 2010 and October 2011, with the reports being published once the Reporting Authorities have received feedback from the Secretary of State for Environment, Food and Rural Affairs. The findings from the first round of the Adaptation Reporting Power will be published once the whole process has been completed, in early 2012. A full timetable for the Adaptation Reporting Power is outlined in Table 1-1 and Annex 1 contains a full list of reporting deadlines and the dates when Reporting Authorities will receive feedback from the Defra Secretary of State.

Table 1-1. Timetable for the Adaptation Reporting Power.

Date	Milestone
November 2009	Strategy for using the Adaptation Reporting Power laid before Parliament
February – March 2010	Priority Reporting Authorities directed to report
September 2010 – October 2011	Adaptation Reports received from Reporting Authorities
January 2011	Publication of ‘benchmarker’ reports and summary of findings

February 2011-December 2011	Publication of Adaptation Reports as they are agreed with Defra's Secretary of State
January 2012	Defra publishes report setting out findings from the first round of the Adaptation Reporting Power together with a summary of each sector
June 2012	Consultation on the strategy for the second round of using the Adaptation Reporting Power and Statutory Guidance
End of 2012	Second strategy for using the Adaptation Reporting Power and Statutory Guidance laid before Parliament
2013	Second Climate Change Adaptation Report Direction to Reporting Authorities issued
2014-15	Second set of reports from Reporting Authorities submitted to the Secretary of State
2017	Third Strategy for using the Adaptation Reporting Power and Statutory Guidance laid before Parliament

Following submission, the Adaptation Reports will be analysed by the Cranfield team, Defra's Adapting to Climate Change Programme team and lead Government Departments. Table 1-2 outlines the roles of each of these organisations during the evaluation process.

Table 1-2. Organisations involved in the evaluation of the Adaptation Reporting Power Adaptation Reports.

Cranfield University	Lead Policy Government Department	Defra
<p>Risk experts from the Risk Centre at Cranfield University will independently analyse the risk assessment methodology and results in each Adaptation Report. Their findings will be reported to Defra and lead Government Departments.</p> <p>They will also produce sector summaries of the risks.</p>	<p>Policy leads in relevant departments (e.g. Department for Transport for the aviation sector) and Devolved administrations, where appropriate, will evaluate the Adaptation Report from a policy perspective (i.e. lessons to inform future work) and identify information gaps and barriers to action.</p>	<p>The Adapting to Climate Change Programme team will examine the Adaptation Reports and identify any barriers to action and interdependencies between risks.</p> <p>The Adapting to Climate Change Programme team are the final arbiters of the reports. They will incorporate feedback from Cranfield and the lead policy Government Departments into the response to the Reporting Authorities via a letter from the Secretary of State for Environment, Food and Rural Affairs. They will also publish the sector summaries.</p>

1.1. The role of Defra and Government

The overall responsibility for the Adaptation Reporting Power and the evaluation process lies with Defra who will ensure that the timetable is followed and all the reports and sector summaries are published so that the public is able to review them.

The Adapting to Climate Change Programme (ACC) team in Defra will receive the reports before distributing them to the team at Cranfield, who will evaluate the risk assessment, and to the relevant Government Departments and Devolved Administrations (where appropriate) with an interest in each particular plan, who will assess them from a policy perspective, checking them against current and future policy and offering views on information gaps and any barriers that have been identified. The ACC team will lead the overall process of analysing and evaluating the reports. They will also compile the evidence to produce a summary evaluation to feed back to each organisation.

The analysis provided by the relevant Government Departments, Devolved Administrations (where appropriate), the report from Cranfield, and the analysis by the Infrastructure and Adaptation Reporting Power team will then be drawn together to form constructive feedback from the Secretary of State for Environment, Food and Rural Affairs to Reporting Authorities on their Adaptation Report. This will be completed within 3 months of receiving the original report.

Once a sector has reported, the ACC team will hold a workshop with all the Reporting Authorities and other interested parties to assess the overall response of that sector and identify where work might be needed in the future. The sector summaries provided by Cranfield will play an important role in these workshops.

Defra will publish the reports on the Defra website once they have been evaluated and feedback has been provided to the Reporting Authority. Sector summaries and a cross-sector report on the findings of the first round of the Adaptation Reporting Power will be published in early 2012.

Defra understands that some information in the plans may be sensitive for commercial or security reasons. However, the Government is committed to putting as much information as possible into the public domain, and is legally obliged to publish the full report except for information which can be withheld in accordance with the exceptions in the Freedom of Information Act 2000 (and related regulations) including the Environmental Information Regulations 2004, or for which disclosure is prohibited by another piece of legislation. **It is therefore important that reports are marked showing any information that you think should not be published, and a second, redacted version is submitted alongside the complete report.**

1.2. The role of Cranfield

The team at Cranfield will provide independent advice to Defra, consisting of the evaluation of the risk assessment by reference to each of the eight key attributes, and an overall evaluation of the risk assessment contained in the Adaptation Report. This will be presented to the ACC team in Defra who will discuss Cranfield's evaluation of the risk assessment. They will also ensure that the analysis and evaluation of the report from a policy perspective,

provided by the relevant lead Government Department, is combined with the evaluation from Cranfield to provide a summary evaluation to feed back to each organisation. This feedback will be provided by the Secretary of State for Environment, Food and Rural Affairs who will respond formally to the Reporting Authority with the findings of the evaluation within 3 months of the receipt of the Adaptation Report. Table 1-3 outlines this process in detail.

Table 1-3. The timetable for the evaluation process.

Week	Cranfield	Lead Government department	Defra Adapting to Climate Change Programme team	
1	Evaluation of Reporting Authority's Adaptation Report risk assessment Results reported to Defra Adapting to Climate Change Programme team and lead Government Departments	Analysis and evaluation of adaptation plans from a policy perspective (i.e. any conflict with policy objectives) and views on information gaps and barriers identified	Adapting to Climate Change Adaptation Reporting Power team study the Adaptation Report	
2				
3				
4				
5				
6				
7			Development of letters to Reporting Authority based on the feedback from Cranfield and the lead Government Department	
8				
9				
10				
11				Defra Secretary of State sends letter to Reporting Authority
12				

Cranfield's team will also provide sector summaries (detailed in Section 1.4) which will be complemented by a summary from the lead Government Department and the ACC team in Defra. The sector summaries will be shared and discussed with Reporting Authorities within a particular sector via a series of sector workshops. However, they will not be made public until the publication of a report setting out the Government's finding from the first round of the Reporting Power in early 2012 and the publication of all the Reporting Authorities' Adaptation Reports.

Key milestones for Cranfield's evaluation of the first round of the Adaptation Reporting Power Adaptation Reports are presented in Table 1-4.

Table 1-4. Key milestones for Cranfield’s evaluation of the Adaptation Reports.

Date	Milestone
30 th September 2010	Adaptation Reports received from ‘benchmarker’ Reporting Authorities
November 2010	Cranfield provide Defra with advice on the quality of the risk assessments in the Adaptation Reports submitted by ‘benchmarker’ Reporting Authorities Evaluation Framework evaluated and revised if necessary
December 2010 – October 2011	Adaptation Reports received from remaining Reporting Authorities
January 2011 – November 2011	Cranfield provide Defra with advice on the quality of the risk assessments in the Adaptation Reports submitted by the remaining Reporting Authorities
January 2011	Cranfield provide Defra with a document highlighting findings from the ‘benchmarker’ exercise which will feed into a Defra document to be published with the benchmarker reports
30 th November 2011	Cranfield provide Defra with a report summarising lessons learned from the first round and organisations’ preparedness/adaptive capacity based on the evaluation of all of the risk assessments. Cranfield will also highlight current risks (e.g. interdependencies) and identify any key areas for future research. This will feed into the final Government findings document to be published in early 2012. The report will also inform the next strategy for using the Adaptation Reporting Power
Early 2012	Publication of the Government’s findings from the first round of the Adaptation Reporting Power including publication of sector summaries

1.3. The purpose of the evaluation framework

To ensure that each Adaptation Report’s risk assessment meets the Direction, each one will be assessed to ensure:

- The risk assessment and the methodology used is well-evidenced;
- The risk assessment has been completed by referring to existing good practice;
- The adaptation measures are focused on key risk priorities identified.

To ensure consistency in assessment, a methodology for evaluating reports has been produced by risk specialists at Cranfield University. This document sets out the evaluation framework that will be used by the Cranfield team to assess each Reporting Authority’s

approach to climate risk in their Adaptation Report (i.e. the risk assessment part of each report).

A key priority in developing the evaluation framework is to ensure it is flexible to cope with the different sectors who have been Directed to report and who are at different stages in adapting to climate change.

Reporting Authorities should be aware that the evaluation framework has been developed to stimulate good practice in managing their climate change risks and is intended to aid them in undertaking their risk assessment and the development of an adaptation plan. It is also intended to promote consistent reporting formats and allow sectors to be compared.

It is important to stress that the risk assessments are not being scored or marked and that Reporting Authorities will not be ranked against one another. Similarly, the evaluation framework should not be viewed as a tick box exercise and organisations should adopt an approach to their Adaptation Reports that is appropriate to them. For example, Reporting Authorities may wish to build on existing studies that they have conducted or use expert judgement rather than quantitative models when conducting their risk assessment.

We are aware that not all Reporting Authorities will be able to fully address all of the criteria in the evaluation framework.

To ensure the evaluation framework is fit for purpose in practice, the framework will be re-assessed following the first Adaptation Reports received on 30th September 2010. Any revisions will be made by the end of November 2010 and Reporting Authorities will be informed of any changes.

1.4. The evaluation framework

The evaluation framework will assist the overall evaluation of the Adaptation Reports submitted by Reporting Authorities to Defra. This will comprise a qualitative evaluation against eight key attributes and an overall assessment of the report, highlighting areas of good practice and areas for possible further work. The overall evaluation will provide an assessment of the report based on the following headings (referring to Box 2 of the Statutory Guidance):

- Functions impacted by climate change
- Approach
- Summary of risks
- Actions proposed to address risks
- Uncertainties and assumptions
- Barriers to adaptation and interdependencies
- Monitoring and evaluation
- Good practice examples within the report
- Areas for further work

In addition, sector summaries will be provided to Defra which will consist of an overall assessment of each sectors² (e.g. energy generators) risks from climate change and strategies to adapt. These will include a description of good practice (including concrete adaptation), any common risks, barriers and interdependencies that may affect the sector, and will be published in early 2012 (following discussion with each sector throughout 2011).

At the same time, Cranfield will also produce a document for Defra summarising lessons learnt from the first round of the Adaptation Reporting Power, organisations' preparedness/adaptive capacity from the risk assessments, as well as highlighting current risks for future climate change and any areas for future research. This will feed into Defra's planned document in early 2012 publishing the sector summaries and cross-sector findings.

1.4.1. Using the eight key attributes

In the evaluation framework, eight key attributes represent the key components of an Adaptation Report risk assessment. These were identified by careful examination of the Statutory Guidance, the Climate Change Adaptation Report Direction, and in discussion with the Adapting to Climate Change Programme team within Defra. They reflect good risk assessment and risk management practice. These are:

1. Climate change risk assessment is a clear component of corporate risk appraisal;
2. Climate change risk assessment enables the Reporting Authority to make evidence based decisions on adapting to climate change;
3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies;
4. Climate change risk assessment and adaptation measures explicitly consider uncertainties;
5. Climate change risk assessment generates priorities for action;
6. Climate change risk assessment identifies opportunities (where applicable);
7. Clear demonstration of flexible adaptation measures; and
8. Monitoring and evaluation of adaptation effectiveness.

Each attribute is broken down into a number of sub-attributes drawn from the Statutory Guidance (Table 1-5 on page 11). The sub-attributes, described in further detail in Section 2, consist of four discrete descriptors against which tangible evidence within the report will be identified and evaluated as being:

- **Not present**; meaning there is no evidence of this aspect having been addressed.
- **Partially complete**; meaning preliminary evidence is available but there are some concerns with the method used, or the evidence gathered is not comprehensive.
- **Complete**; meaning this attribute is comprehensively addressed.
- **Complete and fully integrated**; meaning this attribute is addressed in full and there is clear evidence of the thinking being woven into other business processes and/or strategic plans accordingly. *This will frequently be the 'stretch target' for*

² It is envisaged that sector summaries will be based on the sectors outlined in Annex 1 although some sectors (e.g. aviation and strategic airport operators) may be aggregated following the identification of common risks, barriers and interdependencies in the Adaptation Report risk assessments.

organisations and it is not the expectation that organisations will necessarily reach this target in this round of reporting as adaptation is an ongoing process.

The evaluation will be used to produce 'radar plots' or 'spider diagrams' that will visually present the relative strengths of each report and areas where further work will be required by organisations. Multiple plots will be used to present an overall picture for individual sectors and will allow a comprehensive multi-sector picture to be constructed from the first round use of the Adaptation Reporting Power (Figure 1-1).

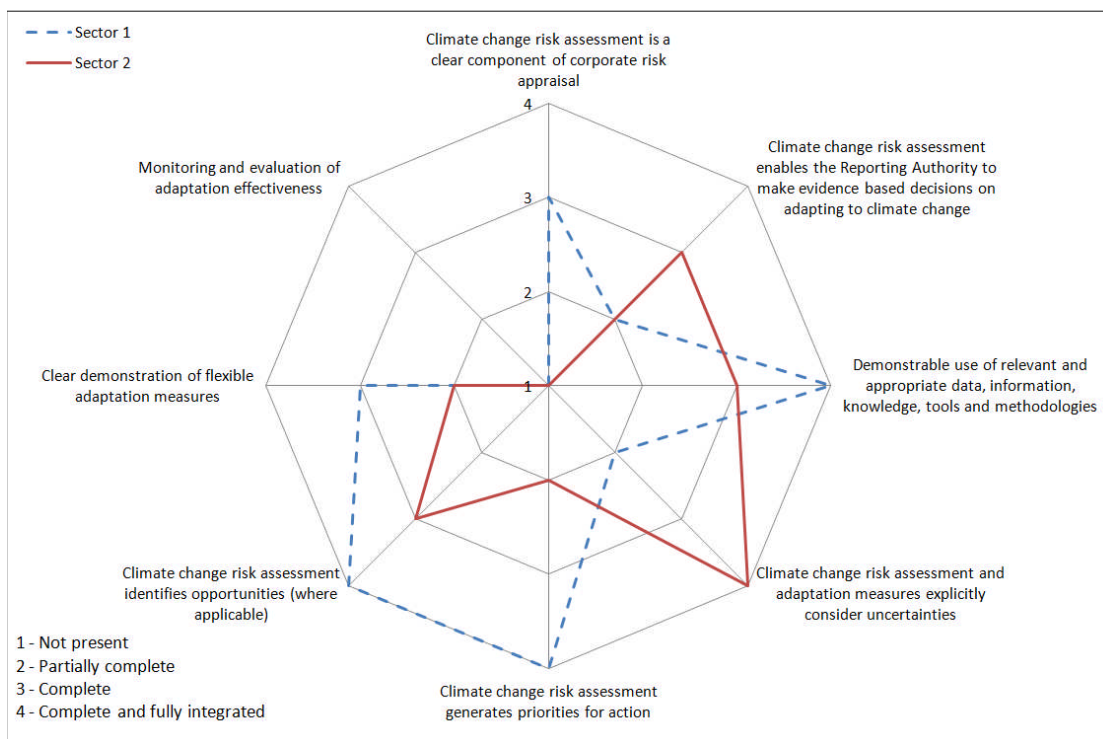


Figure 1-1. Illustrative example of the type of 'radar plot' used to communicate the evaluation of two sectors by reference to the eight key attributes.

It is important to note that not all Reporting Authorities can be, or will be, expected to address all attributes to the level of “complete and fully integrated”. Indeed, adapting to climate change is a continuing process which will involve continual monitoring, assessment, implementation and evaluation and all organisations – within and between sectors – will be at different stages of this process. As result, the evaluation framework is intended to stimulate good practice to embedding climate risk within Reporting Authorities; the framework is not about ranking organisations against each other.

The evaluation framework will play an important role in ensuring that each Adaptation Report will be assessed using a consistent methodology. It will also facilitate cross-sector comparisons and provide input into the UK’s first (and subsequent) Climate Change Risk Assessment. Furthermore, the evaluation framework will help influence Defra ahead of the second round of the Adaptation Reporting Power in 2012 and determine the level and type of support Reporting Authorities may need going forwards.

Table 1-5. Attributes and sub-attributes of the evaluation framework and links to the Statutory Guidance.

Key attribute ³	Sub-attribute:	Statutory Guidance reference
1. Climate change risk assessment is a clear component of corporate risk appraisal	1.1 Climate change demonstrably a key consideration in corporate planning and processes of the Reporting Authority	§1.10; §1.11; Annex B, 1.
	1.2 Reporting Authority presents a clear analysis of climate risks on business operations for specified periods into the future and includes high priority climate related risks and timescales	§3.2 Box 1; §3.11 Box 2; Annex C Table 2
	1.3 Adaptation plan is clearly embedded in the core of the Reporting Authority's business	§3.2 Box 1; §3.11 Box 2; Annex B, 2; Annex C Table 2
	1.4 Reporting Authority includes some prior evaluation of how its climate change risks impact upon or are affected by stakeholders	§3.11 Box 2
	1.5 Reporting Authority considers the existing policies and procedures related to climate impacts, and the effect the weather has on operations and the achievement of the organisation's strategic objectives	§4.6

³ Not every authority is expected to follow the risk assessment approach (Annex C of the Statutory Guidance) in its entirety and it is up to the authority to determine what works best for them (§4.2); where adaptation requires a long lead time, the authority should highlight that it has begun to investigate adaptation options or has included them in its future work programme (§5.7).

2. Climate change risk assessment enables the Reporting Authority to make evidence based decisions on adapting to climate change	2.1 Reporting Authority adopts a conceptual risk management framework for organisational, rather than locational risks	§3.11; Annex C
	2.2 Reporting Authority identifies the key climate variables and their potential impact on the organisation	§3.2 Box 1; §4.1; Annex B, 6.
	2.3 Reporting Authority provides clear criteria for likelihood and consequence that are appropriate and specific to their organisation	§3.2 Box 1; Annex B, 4;
	2.4 Reporting Authority's risk assessment quantifies, or otherwise estimates or characterises the impact and likelihood of risks occurring at various points in the future	§3.11 Box 2; §4.14
	2.5 Reporting Authority presents all the organisation's strategic risks from climate change on a likelihood/consequence matrix, where possible including the climate thresholds above which climate change poses a threat to the organisation. Where it is not possible, the Reporting Authority should set out how it will investigate thresholds.	§3.11 Box 2; §3.2 Box 1; §4.10
	2.6 Reporting Authority considers short, medium and long term risks of climate change disaggregated into different locations where appropriate, and includes an assessment of the level of confidence in these calculations	§3.11 Box 2; §4.1; §4.12
3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies	3.1 Reporting Authority adopts the latest set of UK Climate Projections (currently UKCP09) or other appropriate scenarios or climate information	§2.9; §4.4; Annex C Table 2
	3.2 Reporting Authority demonstrably assesses using the best evidence suitable to organisational need	§3.2 Box 1; §4.11; Annex B, 3
	3.3 Reporting Authority's risk assessment includes consultation with interested parties or stakeholders	§1.16

4. Climate change risk assessment and adaptation measures explicitly consider uncertainties	4.1 Reporting Authority's risk assessment includes a statement of the main uncertainties in the evidence, approach and method used in the adaptation plan and in the operation of the organisation	§3.11 Box 2; Annex B, 5
	4.2 Reporting Authority's adaptation responses explicitly account for uncertainties and interdependencies of actions, including the actions of others on the adaptation plan	§3.2 Box 1
	4.3 Reporting Authority's adaptation plan includes a clear statement of assumptions which are well evidenced and justified	§3.11; Box 2; §3.14
5. Climate change risk assessment generates priorities for action	5.1 Reporting Authority provides priority areas for action that are demonstrably linked to the development of a risk-based adaptation plan	§3.2 Box 1; §4.2; §4.7; §4.9; §5.1; Annex C Table 2
	5.2 Reporting Authority's adaptation plan includes a detailed action plan covering its priority areas. This should ideally include timescales, resources and responsibilities and be included in the report ⁴ .	§5.6; §5.7
	5.3 Reporting Authority's risk management actions are targeted to demonstrably reduce risks to a defined (by the organisation) level of residual risk	§3.2 Box 1
	5.4 Reporting Authority's adaptation plan is subject to appraisal against sustainability principles, and specifically to an appraisal of costs and benefits	§3.2 Box 1; §3.11 Box 2; §5.2; §5.5; §5.8; §5.9; §5.10; §5.18; §5.20; §5.23; §5.24

⁴ Where this is not possible, (e.g. to avoid duplication with your corporate risk register or for commercial/confidentiality issues) this should be explained and the action plan made available for Cranfield to review during the evaluation process if necessary.

6. Climate change risk assessment identifies opportunities (where applicable)	6.1 Reporting Authority's risk assessment allows an evaluation of net benefits and/or opportunities arising from the impacts of climate change	§2.15; §2.17; §3.11 Box 2; §5.14; §5.21
7. Clear demonstration of flexible adaptation measures	7.1 Reporting Authority's adaptation plan includes strategies to deal with the level of quantified risk and retains flexibility over which future course of action to follow as knowledge improves and projections change	§4.15; §5.11; §5.12; §5.13; §5.14; §6.8; §6.10
	7.2 Reporting Authority's adaptation plan includes a statement of the barriers to implementation and a means for overcoming these	§3.11 Box 2
8. Monitoring and evaluation of adaptation effectiveness	8.1 Where possible, the Reporting Authority's report shows progress already made against its adaptation plan	§3.1
	8.2 Reporting Authority makes clear provision for the evaluation of the effectiveness and viability of its adaptation plan	§3.2 Box 1; §3.11 Box 2; §6.3; §6.6
	8.3 Reporting Authority makes clear provision for monitoring thresholds, above which climate change impacts will pose a risk to the organisation, and their incorporation into future risk assessments ⁵ .	§3.11 Box 2
	8.4 Reporting Authority makes clear provision for the monitoring of residual risks from climate change on the organisation and its stakeholders	§3.11 Box 2; §5.1
	8.5 Reporting Authority offers evidence that the production of the risk assessment and adaptation plan has led to a change in the organisation's management of climate risks	§3.11 Box 2

⁵ Where thresholds are not known, a clear commitment to address this should be made wherever possible.

2. Understanding the eight key attributes

2.1. Climate change risk assessment is a clear component of corporate risk appraisal (key attribute 1)

One of the key aims of the Adaptation Reporting Power is to ensure that adapting to climate change becomes embedded within existing structures of all Reporting Authorities. The impacts of climate change on a Reporting Authority's business should be seen as another business risk within the corporate risk register; to be managed, as needed, by an adaptation plan that is appropriately resourced, implemented, monitored and evaluated.

As is the case for all business risks, there is the expectation that climate risks will be reviewed periodically and appraised alongside other business risks, and prioritised accordingly.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-1.

Table 2-1. Evidence required within the risk assessment for key attribute 1.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
1.1 Climate change demonstrably a key consideration in corporate planning and processes of the Reporting Authority	No evidence identified	High level statement that climate change risks will require management by reference to strategic objectives	Formal consideration and analysis of climate change impacts at a strategic level	Strategic analysis of climate change risks alongside other business risks and consideration of resource requirements to manage priority risks
1.2 Reporting Authority presents a clear analysis of climate risks on business operations for specified periods into the future and includes high priority climate related risks and timescales	No evidence identified	Indicative recognition of scale and extent of climate change risks to business	Formal analysis of climate change risks within a business risk matrix	Formal analysis and presentation of climate change risks in the content of other business risks by reference to expected future trend and review timescales

1.3 Adaptation plan is clearly embedded in the core of the Reporting Authority's business	No evidence identified	Indicative plan to continue assessment of climate change risks, and/or indication of an initial response as a result of this exercise	Summarised plan for continued assessment of climate change risks, and/or clear evidence of risk management actions following risk assessment	Clear structured plan for continued assessment of climate change risks, and/or integrated adaptation plan with risk management actions prioritised, resourced and actioned
1.4 Reporting Authority includes some prior evaluation of how its climate change risks impact upon or are affected by stakeholders	No evidence identified	Identification of key relevant stakeholders associated with climate change risks	Consultation with key relevant stakeholders associated with climate change risks	Active engagement with key relevant stakeholders in the assessment and management of prioritised climate change risks
1.5 Reporting Authority considers the existing policies and procedures related to climate impacts, and the effect the weather has on operations and the achievement of the organisation's strategic objectives	No evidence identified	Indication that key strategic priorities and functions may be affected by climate change and the weather	Evidence that key strategic priorities and functions may be affected by climate change and the weather, and use of this in the risk assessment report	Evidence that business is mindful of the impact of climate change and the weather, and there is evidence of active, ongoing consideration of their influence and impact on business decisions

2.2. Climate change risk assessment enables the Reporting Authority to make evidence based decisions on adapting to climate change (key attribute 2)

Risk assessments are only as valuable as the data that supports them. How evidence is gathered, evaluated and then used in a structured and proportionate way to inform the risk assessment is therefore critical. The risk assessment is used to prioritise key climate risks and subsequently to inform the adaptation plan. This will require the identification of the key climate variables (such as temperature, rainfall sea level rise, lightning or wind speed) that impact on the current and future operations of the authority. The exact variables will vary between the Reporting Authorities; so an Adaptation Report should identify why these variables are important for that authority as well as the impact of that variable, the thresholds (where sufficiently robust data/evidence allows this) at which the variable becomes important and sources of data (e.g. the UKCP09 projections) used in the

assessment. This information should be used in relation to an appropriately defined timeframe (e.g. short, medium and long term) and identify the risk appetite and/or vulnerability of the Reporting Authority. The report should also identify the degree and type of uncertainty associated with any impacts/risks based on the climate variables.

Where quantitative information is available and of value to the risk assessment, it should be used. However, sound logical and robust risk assessments can also be made using qualitative data (e.g. a qualitative description of the risk, such as high, medium or low, defined in relation to the organisation and including defined probability and consequence scales) and each Reporting Authority should decide what level of evidence and data is suited to their needs. This will allow a Reporting Authority to prioritise the risks and construct a robust adaptation plan that addresses these risks.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-2.

Table 2-2. Evidence required within the risk assessment for key attribute 2.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
2.1 Reporting Authority adopts a conceptual risk management framework for organisational, rather than locational risks	No evidence identified	Identification of key organisational risks within a business risk management framework	Structured analysis of climate change risks within a business risk management framework	Evidence for the identification of key drivers of climate change risk within the organisation, of an adaptation plan and forward risk assessment programme that addresses these key features
2.2 Reporting Authority identifies the key climate variables and their potential impact on the organisation	No evidence identified	Identifies some climate variables specific to organisation, but list is limited or method used to evaluate variables is not deemed fit for purpose	Analyses and evaluates all relevant climate variables specific to organisation, using a method that is fit for purpose	Evaluates key climate variables and thresholds specific to organisation, above which impacts will affect organisation

<p>2.3 Reporting Authority provides clear criteria for likelihood and consequence that are appropriate and specific to their organisation</p>	<p>No evidence identified</p>	<p>States risk appetite and vulnerability, without sound methodology</p>	<p>Evidence of formal consideration of risk appetite and organisational vulnerability, with sound methodology for evaluating likelihood and consequence criteria specific to organisation</p>	<p>Likelihood and consequence criteria actively employed to evaluate risk acceptability for climate change risks alongside other business risks using sound methodology</p>
<p>2.4 Reporting Authority's risk assessment quantifies, or otherwise estimates or characterises the impact and likelihood of risks occurring at various points in the future</p>	<p>No evidence identified</p>	<p>Generic estimates of impact and likelihood, without sound methodology</p>	<p>Semi-quantitative, or quantitative assessment of impact and likelihood, with sound methodology</p>	<p>Full quantified assessment of impact and likelihood, with detailed methodology and contextual presentation alongside other quantified risks</p>
<p>2.5 Reporting Authority presents all the organisation's strategic risks from climate change on a likelihood/consequence matrix, where possible including the climate thresholds above which climate change poses a threat to the organisation⁶</p>	<p>No evidence identified</p>	<p>Matrix of likelihood/consequence, without methodology</p>	<p>Semi-quantified matrix of likelihood/consequence, with supporting methodology</p>	<p>Comprehensive matrix of likelihood/consequence, with appropriate timescales, risk acceptance thresholds and detailed methodology</p>

⁶ . Where it is not possible, the Reporting Authority should set out how it will investigate thresholds.

2.6 Reporting Authority considers short, medium and long term risks of climate change disaggregated into different locations where appropriate, and includes an assessment of the level of confidence in these calculations	No evidence identified	Separation of short, medium and long term risks but without sound estimation of confidence	Separation and prioritisation of short, medium and long term risks by location, recognising that risks are unevenly distributed temporally and spatially, with a sound calculation of confidence	Separation and prioritisation of short, medium and long term risks by location with assessment of confidence level, recognising that risks are unevenly distributed temporally and spatially
---	------------------------	--	--	--

2.3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies (key attribute 3)

This attribute refers to the appropriateness of the methodology used in the risk assessment. Defra’s Statutory Guidance to Reporting Authorities deliberately avoids prescribing a set methodology to allow for flexibility, enabling each Reporting Authority to select the method and supporting data most suited to their circumstances.

As such, the Reporting Authority should provide sufficient detail regarding their choice of methodology and evidence used. The intent here is for the Adaptation Report’s risk assessment to illustrate that it is fit for purpose and takes a proportionate approach. This will also depend on the type of Reporting Authority, the magnitude of the climate change risks it faces and the priority these risks have alongside other business risks.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-3.

Table 2-3. Evidence required within the risk assessment for key attribute 3.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
3.1 Reporting Authority adopts the latest set of UK Climate Projections (currently UKCP09) or other appropriate scenarios or climate information	No evidence identified	Use of climate information within the organisational context, but methods or data chosen is inappropriate	Correct and justified use of climate information within the organisational context with an accompanying rationale for use	Full and appropriate use of climate information with justification and demonstrable understanding of implications over the choice of scenarios for the risk assessment

<p>3.2 Reporting Authority demonstrably assesses using the best evidence suitable to organisational need</p>	<p>No evidence identified</p>	<p>References and links supporting evidence to risk assessment</p>	<p>Discusses the selection of relevant supporting evidence used in the risk assessment by reference to organisational context</p>	<p>Discusses the selection of supporting evidence used in the risk assessment by reference to organisational context, identifying where risks are particularly sensitive to the selection of specific lines of evidence</p>
<p>3.3 Reporting Authority's risk assessment includes consultation with interested parties or stakeholders</p>	<p>No evidence identified</p>	<p>Identification of stakeholders associated with climate change risks</p>	<p>Consultation with key relevant stakeholders on the scoping and methodology of the risk assessment</p>	<p>Ongoing engagement with key relevant stakeholders on the outcome of the risk assessment and associated adaptation plan</p>

2.4. Climate change risk assessment and adaptation measures explicitly consider uncertainties (key attribute 4)

All risk assessments have associated uncertainties; some of which can be addressed, others which may be irresolvable. These may be due to uncertainty in climate data or to unknown future operating conditions for the Reporting Authority. It is important to understand where the assessment of risk is itself vulnerable to underlying uncertainties. It is therefore good practice to evaluate the sensitivity of the risk assessment to these uncertainties.

Some uncertainties will have little effect on a Reporting Authority's decision to act; others may be sufficiently influential that Reporting Authorities will seek to have these resolved before decisions can be made, though uncertainty should not equate to inaction.

Many Reporting Authorities will also be impacted by the actions of other organisations and these may represent further uncertainties in the risk assessment process and should be acknowledged and evaluated. Reliance on, or interdependences with, other organisations should be mapped, with knock-on effects identified, both to the Reporting Authority, and where appropriate, to the external organisation.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-4.

Table 2-4. Evidence required within the risk assessment for key attribute 4.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
4.1 Reporting Authority's risk assessment includes a statement of the main uncertainties in the evidence, approach and method used in the adaptation plan and in the operation of the organisation	No evidence identified	Identification of main uncertainties in the evidence, approach and method, but little/no consideration of how this affects the overall risk assessment	Explicit discussion of the key uncertainties in the evidence, in the risk assessment approach, with implications for the risk assessment findings	Exploration of the sensitivities of the risk assessment to key uncertainties, with alternative actions for priority risks that are vulnerable to underlying uncertainties
4.2 Reporting Authority's adaptation responses explicitly account for uncertainties and interdependencies of actions, including the actions of others on the adaptation plan	No evidence identified	Some indication of how the adaptation response can deal with uncertainty, and identification of other organisations that may impact on adaptation response	Good coverage of how the adaptation response is robust to uncertainties, and discussion of the extent to which management of the Reporting Authority's risks are contingent on other organisations' actions	Full coverage of how the adaptation response is robust to uncertainties, and exploration of the sensitivities of others' actions on the Reporting Authority's risks, together with plans to address these
4.3 Reporting Authority's adaptation plan includes a clear statement of assumptions which are well evidenced and justified	No evidence identified	Statement of assumptions within adaptation plan but not how these impact on the resulting actions	Rationale for the assumptions made, set within an organisational context, so establishing the credibility of assumptions, and discussion of how they impact on the findings and how they can be addressed	Exploration of the sensitivity of adaptation plan to underlying assumptions

2.5. Climate change risk assessment generates priorities for action (key attribute 5)

A key aim of the Adaptation Reporting Power is to ensure adaptation is embedded into organisational planning. Risks from climate change that are deemed unacceptable need to be identified and managed accordingly: the risk assessment should aim to identify these priority risks for action.

Reporting Authorities should ensure that actions are undertaken and not stop at merely identifying the risks. There should be a clear link between the priority risks identified and the adaptation plan that is produced and implemented by the Reporting Authority.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-5.

Table 2-5. Evidence required within the risk assessment for key attribute 5.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
5.1 Reporting Authority provides priority areas for action that are demonstrably linked to the development of a risk-based adaptation plan	No evidence identified	Risk assessment classifies risks according to their priority, but method or coverage is limited	Evidence of a sound and demonstrable prioritisation of risks, with clear links between priority risks and the subsequent adaptation plan	Adaptation plan is targeted towards the key features of the priority risks
5.2 Reporting Authority's adaptation plan includes a detailed action plan covering its priority areas. This should ideally include timescales, resources and responsibilities and be included in the report ⁷	No evidence identified	Priority risks are linked to adaptation response but there are gaps	Adaptation action plan includes timescales, resources and/or general responsibilities	Full detailed adaptation action plan, with timescales, resources, responsibilities and monitoring provided for

⁷ Where this is not possible, (e.g. to avoid duplication with your corporate risk register or for commercial/confidentiality issues) this should be explained and the action plan made available for Cranfield to review during the evaluation process if necessary.

5.3 Reporting Authority's risk management actions are targeted to demonstrably reduce risks to a defined (by the organisation) level of residual risk	No evidence identified	Aims to reduce priority risks but proposed targets are limited or unsupported	Clear target to reduce priority risks with timescale	Clear target to reduce priority risks to specified level of acceptable residual risk with timescale, with justified selection of risk management measures
5.4 Reporting Authority's adaptation plan is subject to appraisal against sustainability principles, and specifically to an appraisal of costs and benefits	No evidence identified	Adaptation plan provides a narrative of economic, social and environmental benefits, but coverage or treatment of these is limited	Qualitative appraisal of economic, social and environmental benefits	Sound and structured sustainability appraisal with supporting cost-benefit analysis

2.6. Climate change risk assessment identifies opportunities (where applicable) (key attribute 6)

While many of the risks associated with climate change may lead to adverse impacts, it is also possible that some climate change impacts may bring benefits and/or opportunities to some organisations. These should be identified and incorporated into a clear plan to help the Reporting Authority secure them.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-6.

Table 2-6. Evidence required within the risk assessment for key attribute 6.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
6.1 Reporting Authority's risk assessment allows an evaluation of net benefits and/or opportunities arising from the impacts of climate change	No evidence identified	Correct identification of easily secured benefits from climate change, with a plan for securing these, but no/incomplete justification	Sound justification, where possible, of benefits from climate change with plan and timescale for securing and exploiting these	Exploration of strategic business and/or reputational advantage gained by securing net benefits, as evaluated

2.7. Clear demonstration of flexible adaptation measures (key attribute 7)

In response to the identification of uncertainties, Reporting Authorities should develop a flexible approach to the implementation of the adaptation plan and adaptation measures as evidence may change, as might the business context.

Each adaptation measure within the Adaptation Plan will be assessed for its flexibility with multiple options and the most appropriate option should be identified based on the sustainability of it and the cost-benefit analyses undertaken. The adaptation plan should include options for reviewing the risks periodically and for responding to changes; for example, when new climate change projections become available.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-7.

Table 2-7. Evidence required within the risk assessment for key attribute 7.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
7.1 Reporting Authority's adaptation plan includes strategies to deal with the level of quantified risk and retains flexibility over which future course of action to follow as knowledge improves and projections change	No evidence identified	Adaptation plan identifies need for flexibility to respond to change, but no/incomplete actions	Adaptation plan identifies areas where flexibility is necessary to respond to future changes	Adaptation plan identifies areas where flexibility is necessary to respond to future changes, along with plan to monitor potential changes
7.2 Reporting Authority's adaptation plan includes a statement of the barriers to implementation and a means for overcoming these	No evidence identified	Barriers to implementation are listed, but list incomplete/unjustified	Barriers to implementation are identified and justified	Barriers to implementation are identified and justified, with a plan to overcome barriers where possible

2.8. Monitoring and evaluation of adaptation effectiveness (key attribute 8)

The final key attribute requires the Reporting Authority to demonstrate how it will continue to assess the effectiveness of its adaptation strategy over time and respond to any changes identified. This attribute links closely to several of the other key attributes, so some overlap is anticipated.

The type of evidence that would indicate this has been achieved for this key attribute is summarised below in Table 2-8.

Table 2-8. Evidence required within the risk assessment for key attribute 8.

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
8.1 Where possible, the Reporting Authority's report shows progress already made against its adaptation plan	No evidence identified	Indication that previous climate change risk assessments undertaken, or of existing policies/procedures in place to adapt to climate change risks	Evidence for the iterative updating of previous climate change risk assessments, by reference to existing policies/procedures in place to adapt to climate change risks	Evidence for a reduction in organisational exposure to climate change risks by reference to active implementation of adaptation plans
8.2 Reporting Authority makes clear provision for the evaluation of the effectiveness and viability of its adaptation plan	No evidence identified	Indicates plan to evaluate adaptation plan	Summarises plan to evaluate adaptation plan	Clear structured plan to evaluate adaptation plan with review timescales and actions
8.3 Reporting Authority makes clear provision for monitoring thresholds, above which climate change impacts will pose a risk to the organisation, and their incorporation into future risk assessments ⁸	No evidence identified	Indicates plan to monitor climate change thresholds and availability of climate change projections for the inclusion in future risk assessments	Summarises plan to monitor climate change thresholds and availability of climate change projections for the inclusion in future risk assessments, with timescales	Clear structured plan to monitor climate change thresholds and availability of climate change projections for the inclusion in future risk assessments, with timescales

⁸ Where thresholds are not known, a clear commitment to address this should be made.

<p>8.4 Reporting Authority makes clear provision for the monitoring of residual risks from climate change on the organisation and its stakeholders</p>	<p>No evidence identified</p>	<p>Indicates plan to continue assessment of climate change risks</p>	<p>Summarises plan for continued assessment of climate change risks</p>	<p>Clear structured plan for continued assessment of climate change risks as adaptation plan proceeds</p>
<p>8.5 Reporting Authority offers evidence that the production of the risk assessment and adaptation plan has led to a change in the organisation's management of climate risks</p>	<p>No evidence identified</p>	<p>Indication of initial response or changes made as a result of this exercise</p>	<p>Firm evidence of initial response or changes made as a result of this exercise</p>	<p>Firm evidence for the implementation and monitoring of measures to manage business exposure to climate change risks</p>

3. Key supporting data

There are several additional data sources that could assist Reporting Authorities in undertaking their climate change risk assessments and in developing their adaptation plans. There is no requirement for all Reporting Authorities to use these data sources and they are presented here merely as suggestions although if used by the Reporting Authority, they should be clearly referenced. Further information is available on the relevant websites.

3.1. Defra's Adapting to Climate Change Programme

Details of Defra's Adapting to Climate Change Programme can be found at the Defra website <http://www.defra.gov.uk/environment/climate/programme/index.htm>

Further information regarding the Adaptation Reporting Power, including the Statutory Guidance and frequently asked questions are also available on the Defra website at <http://www.defra.gov.uk/environment/climate/legislation/reporting.htm>

Please be aware that a new Defra website is currently being developed, following the change in Government, and therefore the locations of these pages may change in the future.

3.2. UK Climate Impacts Programme (UKCIP)

The UK Climate Impacts Programme (UKCIP) provides information on the impacts from climate change on the UK and works with organisations to help them adapt to climate change.

UKCIP have a range of online tools and documents, including a Risk Framework, Adaptation Wizard, and a methodology for costing the impacts of climate change, which can be found at their website <http://www.ukcip.org.uk/>

3.3. UK Climate Projections (UKCP09)

Known as UKCP09, the latest UK climate projections provide probabilistic projections of climate change up to 2100. One of the key benefits of UKCP09 is that they take the known uncertainties associated with climate change into account and have been designed to support decision making. Alongside the future projections are observed datasets of historic weather that may be useful in trying to describe current risk. This information is extremely useful for undertaking a climate change risk assessment and producing an adaptation plan.

Further information and guidance on using the UKCP09 projections can be found at the UKCP website <http://ukclimateprojections.defra.gov.uk/>

3.4. Environment Agency Supplementary Guidance

The Environment Agency has published supplementary guidance providing potentially useful information that may assist other organisations in planning their adaptation strategy. This will be particularly useful to organisations such as the water companies, which are impacted by Environment Agency functions such as flood prevention. It provides data, advice and tools for assessing climate change impacts related to core Environment Agency functions.

The Environment Agency's supplementary guidance document can be found at <http://www.environment-agency.gov.uk/cy/ymchwil/cynllunio/116480.aspx>

3.5. Other useful documents

In addition to the Statutory Guidance document from Defra for undertaking climate change risk assessments, other documents on general risk assessment techniques are available and may prove useful. These include:

Environment Agency, 2000. Introducing Environmental Risk Assessment. National Centre for Risk Analysis and Options Appraisal, Environment Agency, London, available from Environmental Policy – Risk and Forecasting, Reading.

DETR (Department of Environment, Transport and Regions), Environment Agency, Institute for Environment and Health, 2000. Guidelines for environmental risk assessment and management – revised departmental guidance. The Stationery Office, London, UK.

<http://www.defra.gov.uk/environment/quality/risk/eramguide/index.htm>

Willows, R.I. and Connell, R.K. (Eds.), 2003. Climate adaptation: Risk, uncertainty and decision-making. UKCIP Technical Report. UKCIP, Oxford.

http://www.ukcip.org.uk/images/stories/Pub_pdfs/Risk.pdf

HM Treasury, 2003. The Green Book. Appraisal and Evaluation in Central Government.

http://www.hm-treasury.gov.uk/data_greenbook_index.htm

HM Treasury, 2009. Accounting for the Effects of Climate Change. The Green Book Supplementary Guidance.

http://www.hm-treasury.gov.uk/data_greenbook_supguidance.htm
[#Adaptation to Climate Change](#)

4. Example of evaluating the risk assessment within an Adaptation Report

The Cranfield team's advice to Defra will consist of an evaluation of the risk assessment by reference to each key attribute in the evaluation framework and an overall assessment of the Adaptation Report (detailed in Section 1.4). An example of the assessment of an Adaptation Report is provided in Tables 4-1 and 4-2. In this illustrative example, the evaluation indicates areas for improvement in the Adaptation Report, with an overall assessment of 'partially complete' for key attribute 1 – *climate change risk assessment is a clear component of corporate risk appraisal* (Table 4-2).

Table 4-1. Illustrative evaluation of evidence for key attribute 1 - climate change risk assessment is a clear component of corporate risk appraisal.
(italic, red text shows evaluation in this example)

Sub-attribute	Not present	Partially complete	Complete	Complete and fully integrated
1.1 Climate change demonstrably a key consideration in corporate planning and processes of the Reporting Authority		<i>High level statement that climate change risks will require management by reference to strategic objectives</i>	Formal consideration and analysis of climate change impacts at a strategic level	Strategic analysis of climate change risks alongside other business risks and consideration of resource requirements to manage priority risks
1.2 Reporting Authority presents a clear analysis of climate risks on business operations for specified periods into the future and includes high priority climate related risks and timescales		<i>Indicative recognition of scale and extent of climate change risks to business</i>	Formal analysis of climate change risks within a business risk matrix	Formal analysis and presentation of climate change risks in the context of other business risks by reference to expected future trend and review timescales

<p>1.3 Adaptation plan is clearly embedded in the core of the Reporting Authority's business</p>		<p><i>Indicative plan to continue assessment of climate change risks, and/or indication of an initial response as a result of this exercise</i></p>	<p>Summarised plan for continued assessment of climate change risks, and/or clear evidence of risk management actions following risk assessment</p>	<p>Clear structured plan for continued assessment of climate change risks, and/or integrated adaptation plan with risk management actions prioritised, resourced and actioned</p>
<p>1.4 Reporting Authority includes some prior evaluation of how its climate change risks impact upon or are affected by stakeholders</p>	<p>X</p>	<p>Identification of key relevant stakeholders associated with climate change risks</p>	<p>Consultation with key relevant stakeholders associated with climate change risks</p>	<p>Active engagement with key relevant stakeholders in the assessment and management of prioritised climate change risks</p>
<p>1.5 Reporting Authority considers the existing policies and procedures related to climate impacts, and the effect the weather has on operations and the achievement of the organisation's strategic objectives</p>		<p><i>Indication that key strategic priorities and functions may be affected by climate change and the weather</i></p>	<p>Evidence that key strategic priorities and functions may be affected by climate change and the weather, and the use of this in the risk assessment report</p>	<p>Evidence that business is mindful of the impact of climate change and the weather, and there is evidence of active, ongoing consideration of their influence and impact on business decisions</p>

Table 4-2 provides an example evaluation of the Adaptation Report against all eight key attributes, with the accompanying 'radar plot' illustrating the results in a graphical format. In this example, the radar plot indicates that the risk assessment process may require further refinement in future, particularly if it is to enable the organisation to make risk based decisions.

Table 4-2. Illustrative evaluation for all key attributes.

Key attribute	Not present	Partially complete	Complete	Complete and fully integrated
1. Climate change risk assessment is a clear component of corporate risk appraisal		X		
2. Climate change risk assessment enables authority to make evidence based decisions on adapting to climate change	X			
3. Demonstrable use of relevant and appropriate data, information, knowledge, tools and methodologies			X	
4. Climate change risk assessment and adaptation measures explicitly consider uncertainties		X		
5. Climate change risk assessment generates priorities for action			X	
6. Climate change risk assessment identifies opportunities (where applicable)		X		
7. Clear demonstration of flexible adaptation measures				X
8. Monitoring and evaluation of adaptation effectiveness		X		

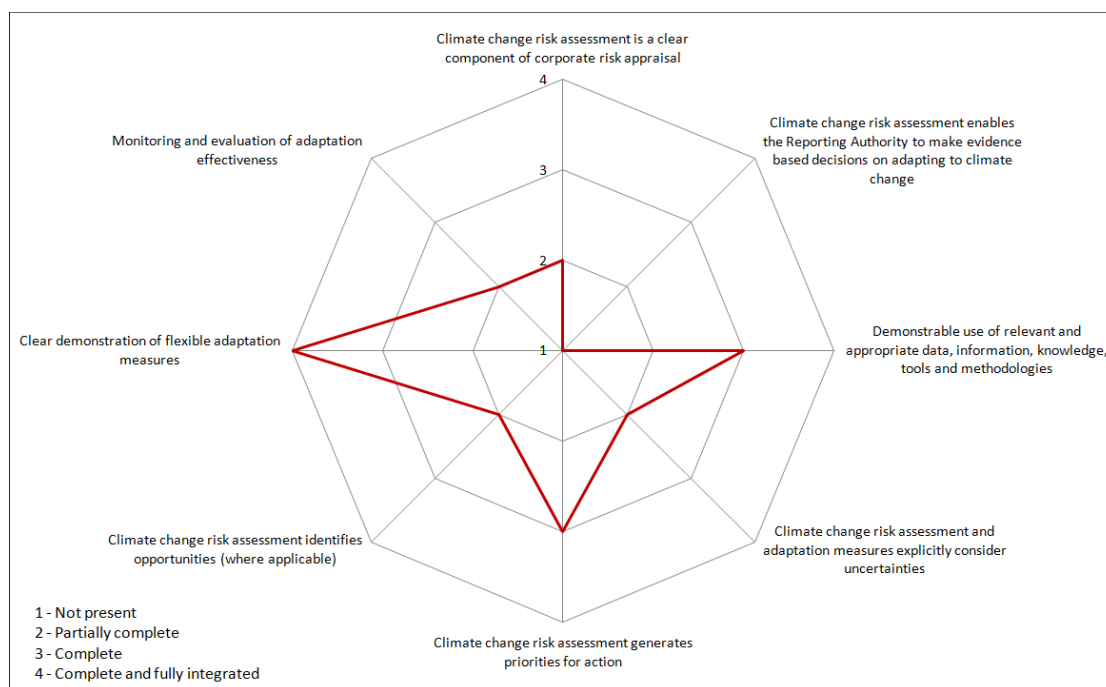


Figure 4-1. Illustrative radar plot presenting the evaluation of the eight key attributes in a graphical format.

5. References

Climate Change Act 2008.

Defra (Department for Environment, Food and Rural Affairs), 2010. UK Climate Change Risk Assessment and Adaptation Economic Analysis.

<http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

Defra, 2010. Adapting to Climate Change: helping key sectors to adapt to climate change. Statutory Guidance to Reporting Authorities 2009.

DETR (Department of Environment, Transport and Regions), Environment Agency, Institute for Environment and Health, 2000. Guidelines for environmental risk assessment and management – revised departmental guidance. The Stationery Office, London, UK.

Environment Agency, 2000. Introducing Environmental Risk Assessment. National Centre for Risk Analysis and Options Appraisal, Environment Agency, London, available from Environmental Policy – Risk and Forecasting, Reading.

HM Treasury, 2003. The Green Book. Appraisal and Evaluation in Central Government.

HM Treasury, 2004. The Orange Book Management of Risk - Principles and Concepts, HM Treasury.

HM Treasury, 2009. Accounting for the Effects of Climate Change. The Green Book Supplementary Guidance.

Office of Government Commerce, 2007. Management of Risk: Guidance for Practitioners, The Stationery Office.

Annex 1. Reporting Authorities and deadlines for their reports and feedback from Secretary of State

Six 'benchmarker' authorities will submit Adaptation Reports on 30th September 2010 to enable the evaluation framework to be piloted. These are the Environment Agency, Highways Agency, National Grid, Natural England, Trinity Lighthouse Authority and Network Rail (Network Rail will be submitting the risk assessment part of the Adaptation Report).

Organisation	Reporting Deadline	Feedback from Secretary of State
Health and social care		
Monitor	30/09/2011	12/2011
Environment		
Environment Agency	30/09/2010	12/2010
Water		
Water Companies serving over 50,000 billed premises		
Anglian Water Services Ltd	31/01/2011	04/2011
Bournemouth and West Hampshire Water Plc	31/01/2011	04/2011
Bristol Water Plc	31/01/2011	04/2011
Essex and Suffolk Water	31/01/2011	04/2011
Northumbrian Water Ltd	31/01/2011	04/2011
Portsmouth Water Ltd	31/01/2011	04/2011
Severn Trent Water Ltd	31/01/2011	04/2011
South East Water Ltd	31/01/2011	04/2011
South Staffordshire Water Plc	31/01/2011	04/2011
South West Water Ltd	31/01/2011	04/2011
Sutton and East Surrey Water Plc	31/01/2011	04/2011
Thames Water Utilities Ltd	31/01/2011	04/2011
United Utilities Water Plc	31/01/2011	04/2011
Veolia Water Central Ltd	31/01/2011	04/2011
Veolia Water East Ltd	31/01/2011	04/2011

Veolia Water Southeast Ltd	31/01/2011	04/2011
Wessex Water Services Ltd	31/01/2011	04/2011
Yorkshire Water Services	31/01/2011	04/2011
Energy		
Office of Gas and Electricity Markets (OFGEM)	30/09/2011	12/2011
Electricity Generators generating over 10TWh; registered in Scotland, England or Wales		
Centrica	31/07/2011	10/2011
Drax Power Limited	31/07/2011	10/2011
E.ON UK	31/07/2011	10/2011
EDF Energy	31/07/2011	10/2011
GDF Suez Energy UK	31/07/2011	10/2011
InterGen	31/07/2011	10/2011
International Power	31/07/2011	10/2011
RWE Npower Plc	31/07/2011	10/2011
Scottish and Southern Energy	31/07/2011	10/2011
Scottish Power Generation Ltd	31/07/2011	10/2011
Electricity Transmitters (registered in Scotland, England or Wales)		
National Grid Electricity Transmission Plc	30/09/2010	12/2010
Scottish Hydro Electric Transmission Ltd	30/06/2011	09/2011
SP Transmission Ltd	30/06/2011	09/2011
Electricity Distributors (registered in Scotland, England or Wales; serving over 50,000 customers)		
Central Networks East Plc	30/06/2011	09/2011
Central Networks West Plc	30/06/2011	09/2011
EDF Energy Networks (Eastern)	30/06/2011	09/2011
EDF Energy Networks (London)	30/06/2011	09/2011
EDF Energy Networks (Seaboard)	30/06/2011	09/2011
Electricity North West Ltd	30/06/2011	09/2011
Northern Electric Distribution Plc	30/06/2011	09/2011
Scottish Hydro Electric Power Distribution Plc	30/06/2011	09/2011
Southern Electric Power Distribution Plc	30/06/2011	09/2011

SP Manweb Plc	30/06/2011	09/2011
SP Distribution Ltd	30/06/2011	09/2011
Western Power Distribution (South Wales) Plc	30/06/2011	09/2011
Western Power Distribution (South West) Plc	30/06/2011	09/2011
Yorkshire Electric Distribution Plc	30/06/2011	09/2011
Gas Transporters (registered in Scotland, England or Wales; serving over 50,000 customers)		
ESP Connections Ltd	30/06/2011	09/2011
GTC Pipelines Ltd	30/06/2011	09/2011
Independent Pipelines Ltd	30/06/2011	09/2011
National Grid Gas Plc	30/09/2010	12/2010
Northern Gas Networks	30/06/2011	09/2011
Scotland Gas Networks Plc	30/06/2011	09/2011
Southern Gas Networks Plc	30/06/2011	09/2011
SSE Pipelines Ltd	30/06/2011	09/2011
Wales and West Utilities	30/06/2011	09/2011
Electronic Communications		
Office of Communications (OFCOM)	30/09/2011	12/2011
Transport		
Rail		
Eurotunnel	30/04/2011	07/2011
Network Rail Infrastructure Ltd	30/04/2011	07/2011
Office of Rail Regulation	31/10/2011	12/2011
Aviation		
Civil Aviation Authority	31/10/2011	12/2011
NATS Holdings Ltd	31/07/2011	10/2011
Strategic Airport Operators (Scotland, England or Wales)		
Birmingham International Airport	31/05/2011	08/2011
Cardiff International Airport	31/05/2011	08/2011
East Midlands Airport	31/05/2011	08/2011
Edinburgh Airport	31/05/2011	08/2011

Glasgow International Airport	31/05/2011	08/2011
London Gatwick Airport	31/05/2011	08/2011
London Heathrow Airport	31/05/2011	08/2011
London Luton Airport	31/05/2011	08/2011
London Stansted Airport	31/05/2011	08/2011
Manchester International Airport	31/05/2011	08/2011
<i>Harbour Authorities relating to ports dealing with over 10 million tonnes of commercial cargo annually (England and Wales)</i>		
ABP Harbour Authority Hull	31/03/2011	06/2011
ABP Harbour Authority Humber	31/03/2011	06/2011
ABP Harbour Authority Immingham	31/03/2011	06/2011
ABP Harbour Authority Southampton	31/03/2011	06/2011
Dover Harbour Board	31/03/2011	06/2011
Harwich Haven Authority	31/03/2011	06/2011
Mersey Docks and Harbour Company	31/03/2011	06/2011
Milford Haven Port Authority	31/03/2011	06/2011
PD Teesport Ltd	31/03/2011	06/2011
Port of London Authority	31/03/2011	06/2011
Port of Sheerness Ltd	31/03/2011	06/2011
The Felixstowe Dock and Railway Company	31/03/2011	06/2011
<i>Lighthouse Authorities (England, Scotland and Wales)</i>		
Corporation of Trinity House of Deptford Strond	30/09/2010	12/2010
Northern Lighthouse Board	31/01/2011	04/2011
<i>Regional</i>		
Greater London Authority	31/12/2010	03/2011