

DOCUMENT CONTROL

Date	Ref	Issue	Title	Modification	Authorised by
16-Nov-17	EM09	01	Climate Change Risk Assessment & Management Plan	New document	ISO 14001 Management Review

1. Introduction

Particular weather events can lead to impacts, for example, an intense rain storm can cause localised flooding. This can have consequences for the people, property, economy or environment of an area, including the ability of an organisation such as Anglia Ruskin University to operate. Climate change is altering the likelihood and magnitude of particular weather events, as well as their associated impacts and consequences.

This climate change risk assessment addresses the risks to ARU resulting from climate and weather events, and their associated health, operational, and financial consequences. It therefore omits any consequences resulting from international migration, energy or food security or carbon pricing which would be addressed under a different policy framework.

2. Purpose

The purpose of this document is to fulfil the commitment in the ARU Environment Policy regarding climate resilience – identify and manage risks to our activities associated with floods, droughts, or heatwaves, for example.

3. Responsibility

The Environment Manager is responsible for maintaining the Climate Change Risk Assessment & Management Plan and presenting any changes to Management Review for approval.

4. Definitions

2020s = the thirty year period 2010-2039

2050s = the thirty year period 2040-2069

2080s = the thirty year period 2070-2099

Climate = weather patterns averaged over a long period, usually 30 years.

Risks & opportunities = potential adverse effects (threats) and potential beneficial effects (opportunities).

Weather = condition of the atmosphere at a particular place over a short period of time.

5. Procedure

5.1 Identify the likelihood, scale and timing of changes to future weather patterns - these are identified for the 3 time periods covering the 2020s, 2050s and 2080s from the UK Climate Projections published in June 2009. These changes are relative to the period 1961-1990 and are based on the high emissions scenario, implying limited success with cutting global carbon emissions, which actual trends have followed since 2009. The key points from the assessment for Cambridgeshire and Essex are as follows:

1. Annual rainfall of about the same amount as present up to the 2080s .
2. Drier summers, with 7% less summer rainfall by the 2020s and 26% less by the 2080s.
3. Wetter winters, with 7% more winter rainfall by the 2020s and 27% more by the 2080s.
4. More intense rainfall during autumn, winter and spring, with rainfall on the wettest winter days 6% higher by the 2020s and 24% higher by the 2080s.
5. Higher temperatures for all seasons throughout the year, with summer temperatures 1.5 degrees higher by the 2020s and 4 degrees higher by the 2080s.
6. Higher temperature extremes for all seasons throughout the year, with the warmest summer days 1.5 degrees higher by the 2020s and 4 degrees higher by the 2080s.

5.2 Identify impacts and opportunities associated with changes to future weather patterns and the primary consequences for ARU.

5.3 Score the likelihood for each time period (2020s, 2050s, and 2080s) and impact severity associated with the risk or opportunity from 1 to 5 using the following criteria. Risks receive a positive impact score and opportunities receive a negative impact score.

Score	1	2	3	4	5
Likelihood / Frequency	Low	Med Low	Med	Med High	High
Impact	Improbable	Remote	Possible	Probable	Likely
	See ARU Risk Assessment Criteria				

5.4 A risk score results from multiplying the scores for likelihood and impact severity. As the likelihood for each primary consequence is identified for the 3 time periods 2020s, 2050s and 2080s, corresponding risk scores are likewise calculated for each time period.

5.5 Risks with a score greater than 10 and opportunities with a score less than -10 are deemed significant.

5.6 Significant risks are highlighted red and significant opportunities are highlighted green.

5.7 Identify risk management options for those risks and opportunities assessed to be significant using the framework developed by the UK Climate Impacts Programme for building adaptive capacity and implementing adaptation actions¹.

5.8 Assess the risk management options against the following criteria to identify those for inclusion in the ARU Environment Strategy.

- a) No regrets - measures that are worthwhile (i.e. they deliver net socio-economic benefits) whatever the extent of future climate change.
- b) Low regrets - measures for which the associated costs are relatively low and for which the benefits, although primarily realised under projected future climate change, may be relatively large.
- c) Win win - measures that have the desired result in terms of minimising the climate risks or exploiting potential opportunities but also have other social, environmental or economic benefits.
- d) Flexible / adaptive - involve putting in place incremental adaptation options, rather than undertaking large-scale adaptation in one fell swoop.
- e) Additional – are the measures additional to existing activity?
- f) Proportionate – do the benefits of the measure justify any associated disbenefits?
- g) Cost effective – do the benefits of the measure justify its cost?
- h) Achievable – is the measure realistically achievable?
- i) Long lead-in – is there a substantial delay between implementation of the measure and its desired effect?
- j) No policy conflict – does implementation of the measure conflict with any other internal or external policy?
- k) Resilient – is the success of the measure independent of any external factor e.g. funding, policy, infrastructure?

6. Review

The Climate Change Risk Assessment & Management Plan shall be reviewed annually by Management Review.

7. Related documents

[Environmental Policy](#)

[Environmental Strategy](#)

[OP01 Document Control Procedure](#)

[AR-RMD-CR01 ARU Corporate Risk Policy Statement and Procedures](#)

[¹UK Climate Impacts Programme, Identifying adaptation options, 2007](#)

CLIMATE CHANGE RISK ASSESSMENT MANAGEMENT PLAN

ID	Climate/ weather event	Likelihood			Impact/ opportunity	Positive/ negative	Primary consequence	Risk Category	Severity (1-5)	Risk score (1-25)			MANAGEMENT OPTION	OPTIONS ASSESSMENT			Flexible / adaptive	Additional	Proportionate	Cost effective	Achievable	Long lead-in	No policy conflict	Resilient	Recommendation	Environment Strategy Ref.						
		2020s	2050s	2080s						2020s	2050s	2080s		No regrets	Low regrets	Win win																
Heat1	Higher temperature extremes (heat waves)	4	5	5	Increased heat stress & other hot weather illnesses	Negative	Increased demand for first aid & medical services	Health & Safety	3	12	15	15	Monitor incidents associated with heat related illnesses.	Yes	Yes		Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Monitor health & safety impacts of future heat wave events.	ENMA:845						
													Identify risk of temperature extremes in Estates & Facilities risk register.	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Currently adds no value.				
													Publicise HSE & NHS Guidance of what to do in the event of a heat wave.	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Publicise HSE & NHS Guidance of what to do in the event of a heat wave.	ENMA:846		
													Accept increased health & safety risk of heat stress.	No													Yes					
													Establish 'cool' zones in ARU premises	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Establish 'cool' zones in ARU premises in the event of a heatwave being declared during teaching time.	ENMA:847	
Heat7	Higher temperature extremes (heat waves)	4	5	5	Increased internal building temperatures	Negative	Increased summer energy & water demand and costs for cooling & refrigeration	Financial	3	12	15	15	Publicise student research project opportunity to identify vulnerability of ARU buildings to high air temperatures and identify energy efficient control measures	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Publicise student research project opportunity to identify vulnerability of ARU buildings to high air temperatures and identify energy efficient control measures	ENMA:848						
													Monitor energy costs and temperature relationship	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Monitor energy costs and temperature relationship	ENMA:849			
													Identify energy efficient solutions for maintaining internal thermal comfort e.g. better building fabric, draught exclusion, brise soleil, phase change materials.	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Identify energy efficient solutions for maintaining internal thermal comfort e.g. better building fabric, draught exclusion, brise soleil, phase change materials.	ENMA:788		
													Publicise behavioural methods of controlling internal temperatures e.g. office organisation to allow airflow, night purging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Publicise behavioural methods of controlling internal temperatures e.g. office organisation to allow airflow, night purging	ENMA:850	
													Accept increased energy & water consumption	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No			
													Install energy & water efficient measures Establish 'cool' zones in ARU premises					No													Duplicates ENMA:788 & ENMA:847.	
Heat8	Higher temperature extremes (heat waves)	4	5	5	Equipment & infrastructure temperature thresholds exceeded	Negative	Disruption to work due to travel disruption, equipment failure (e.g. servers), staff absenteeism	Service Delivery	3	12	15	15	Identify maximum operating temperature thresholds for key equipment and infrastructure	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Identify maximum operating temperature thresholds for key equipment and infrastructure	ENMA:851							

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		2020s	2050s	2080s						2020s	2050s	2080s		No regrets	Low regrets	Win win	Flexible / adaptive									
												Monitor temperatures close to key equipment (e.g. server rooms) and incidents of failure	Yes	Yes	Yes	Yes	No							Monitor temperatures close to key equipment (e.g. server rooms) and incidents of failure	ENMA:852	
												Identify risk of 'Maximum temperature exceedance' within Estates & Facilities risk register.												Currently adds no value.		
												Publicise risks of equipment failure due to high temperatures and control measures	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Publicise risks of equipment failure due to high temperatures and control measures	ENMA:853	
												Accept & respond to disruption of equipment failure.	No	No	No	No	No	No	No	No	No	No	No			
												Install heat resilient equipment and infrastructure (e.g. servers which minimise heat output, building layout designed to minimise heat gain).	Yes	Yes	Yes	Yes	Yes	Yes	?					Assess the costs and benefits of specifying heat resilient equipment and infrastructure (e.g. servers which minimise heat output, building layout designed to minimise heat gain).	ENMA:854	
Wet3	Wetter winters & more intense rainfall	3	4	4	Increased flood risk (river & surface water)	Negative	Disruption to work due to supply chain, utility & travel disruption and staff absenteeism	Service Delivery	4	12	16	16	Effective Business Continuity Planning	Yes	Yes	Yes	Yes	No						No additional action.		
												Accept & respond to agreed level of flood risk.	Yes	Yes										Accept & respond to agreed level of flood risk.		
Wet1	Wetter winters & more intense rainfall	3	4	4	Increased flood risk (river & surface water)	Negative	Disruption to transport, power, communications & water services	Health & Safety	3	9	12	12	Effective Business Continuity Planning	Yes	Yes	Yes	Yes	No							No additional action.	
												Accept & respond to agreed level of flood risk.	No	No	No	No	No	No	No	No	No	No	No	Accept & respond to agreed level of flood risk.		
Wet2	Wetter winters & more intense rainfall	3	4	4	Increased flood risk (river & surface water)	Negative	Increased recovery, repair & insurance costs	Financial	3	9	12	12	Identify risk of flooding within Estates & Facilities risk register.	Yes	Yes	Yes	Yes	No							Currently adds no value.	
												Publicise areas at risk of flooding and actions to prepare for and respond to flooding incidents.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Publicise areas at risk of flooding and actions to prepare for and respond to flooding incidents.	ENMA:857		
												Accept & respond to agreed level of flood risk.	No	No	No	No	No	No	No	No	No	No	Accept & respond to agreed level of flood risk.			
												Identify measures to reduce surface water flood risk for inclusion in the design guide e.g. enlarged gutters, gullies, soakaways.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Identify measures to reduce surface water flood risk for inclusion in the design guide e.g. enlarged gutters, gullies, soakaways.	ENMA:858		
Heat3	Higher temperature extremes (heat waves)	4	5	5	Reduced air quality	Negative	Increased staff absenteeism due to health & safety risk, particularly the elderly & those with respiratory problems	Service Delivery	2	8	10	10														
Heat4	Higher temperature extremes (heat waves)	4	5	5	Increased fire risk	Negative	Health & safety risk	Health & Safety	2	8	10	10														
Heat6	Higher temperature extremes (heat waves)	4	5	5	Increase in burglaries	Negative	Property loss or damage	Service Delivery	2	8	10	10														
Temp1	Higher seasonal temperatures	4	5	5	Increase in vector-borne diseases (incl. Reduced winter die-off)	Negative	Health & safety risk	Health & Safety	2	8	10	10														

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		2020s	2050s						2080s	2020s	2050s		2080s	No regrets	Low regrets										
Temp2	Higher seasonal temperatures	4	5	5	Longer growing season	Negative	Increased grounds maintenance costs	Financial	2	8	10	10													
Temp7	Higher seasonal temperatures	4	5	5	Increased internal building temperatures	Negative	Increased summer energy & water demand and costs for cooling & refrigeration	Financial	2	8	10	10													
Dry2	Drier summers	3	4	4	Increased probability of hosepipe bans & drought orders	Negative	Disruption to water dependent activities (e.g. cleaning, washing, WC's, catering, landscaping)	Service Delivery	2	6	8	8													
Dry3	Drier summers	3	4	4	Drier soils	Negative	Potential subsidence damage to properties and infrastructure with associated service disruption	Service Delivery	2	6	8	8													
Heat2	Higher temperature extremes (heat waves)	4	5	5	Increased water consumption	Negative	Higher water bills due to increased pressure on reducing water availability	Financial	1	4	5	5													
Heat5	Higher temperature extremes (heat waves)	4	5	5	Increased incidence of food poisoning	Negative	Health & safety risk	Health & Safety	1	4	5	5													
Temp6	Higher seasonal temperatures	4	5	5	Increase in vermin & pests (incl. Reduced winter die-off)	Negative	Increased pest management costs	Financial	1	4	5	5													
Dry1	Drier summers	3	4	4	Increased concentration of pollutants in drains, sewers & rivers	Negative	Higher water bills due to lower water quality standards & increased treatment costs	Financial	1	3	4	4													
Temp3	Higher seasonal temperatures	4	5	5	Reduced cold weather illnesses (potentially)	Positive	Reduced staff absenteeism	Service Delivery	-1	-4	-5	-5													
Temp8	Higher seasonal temperatures	4	5	5	Increased internal building temperatures	Positive	Reduced winter energy demand & costs for heating	Financial	-1	-4	-5	-5													
Temp4	Higher seasonal temperatures	4	5	5	Reduced probability of frost, ice & snow	Positive	Public health & safety benefit (slips, accidents)	Health & Safety	-2	-8	-10	-10													
Temp5	Higher seasonal temperatures	4	5	5	Reduced probability of frost, ice & snow	Positive	Less disruption to work due to staff absence, travel delay, ice & snow	Service Delivery	-2	-8	-10	-10													