

Annexes 2 to 5: Further supporting information

Annex 2: The Climate Change Committee's progress report

Annex 3: Monitoring, evaluation and learning

Annex 4: Adaptation Reporting power fourth round scope

Annex 5: Acronyms and glossary

July 2023

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Annex 2: The Climate Change Committee's progress report

2.1 Background

Under section 59 of the Climate Change Act 2008, the Climate Change Committee (CCC) reports on the progress made towards implementing the “objectives, proposals and policies” set out in the previous National Adaptation Programme (NAP). The progress report is issued every 2 years, the most recent being 29 March 2023. The Secretary of State for the Department for Environment, Food and Rural Affairs (Defra) is required to respond to the progress report by 15 October in the year that it is published.

There are 3 interlinked documents on climate adaptation policy which are required from the government by the Climate Change Act 2008:

- the Climate Change Risk Assessment (CCRA), which is published by the government and sets out an assessment of the risks of climate change to the UK
- the NAP, where the government sets out its response to the CCRA
- the response to the progress report, where the government responds to the points made in the most recent CCC progress report

The timescales for these documents are not fully aligned. The CCRA is published every 5 years (CCRA3 was published in 2022), with the response in the NAP required ‘as soon as reasonably practical’ thereafter. However, the progress report is published every 2 years and as a result of these separate cycles, the CCC’s final progress report on the second NAP period was published in March 2023.

The Secretary of State has judged that there is not sufficient time to fully reflect the March 2023 progress report in the current NAP (NAP3) given the need to respond to the CCRA as soon as reasonably practicable. However, a full response will be provided in line with the statutory requirement by 15 October 2023.

In terms of fulfilling the statutory requirements, the NAP must respond to the risks and opportunities identified in the most recent CCRA. As a result, NAP3 has 5 sectoral chapters containing the full 61 risks and opportunities, which mirrors the structure of CCRA3. The progress report has a different structure which we will reflect on in the future. In addition, initial scoping for the next CCRA (CCRA4) has already started. It is expected

that a 'systems-based' approach will be developed with the CCC, to better align new and existing evidence with societal outcomes.

2.2 Reflecting the progress report in NAP3 and beyond

The March 2023 progress report highlighted the urgent need for the UK to adapt to climate change and for NAP3 to be a significant step up to drive the required urgency of response. To this effect, it identifies 6 'high-level requirements' for NAP3. The government recognises the urgency and has taken the 6 requirements into account when developing NAP3. Our approach to each of these is briefly summarised below.

CCC high-level requirement: NAP3 needs to set out a clear and operational vision for adaptation, tied to measurable goals. It needs to have a theory of change to demonstrate outcomes are linked to the activities in the programme.

Response: Chapter 1 introduces our vision for NAP3 and provides direction for the 5-year programme. Annex 3 sets out how further adaptation policy development will follow a theory of change approach.

CCC high-level requirement: NAP3 should make commitments that go beyond current plans and policies. They should be supported by increased public funding on adaptation and enable more private investment.

Response: The government has developed robust actions against each of the 61 CCRA3 risks and opportunities. As documented in Annex 1, risk owners across government have set themselves a number of new and ambitious actions to complete over the NAP3 implementation period (2023 to 2028). NAP3 also sets out the government's commitment on adaptation – for example, the acceleration of around £400 million investment by water companies in new infrastructure to improve water resilience and a new £100 million fund for Ofwat to develop new approaches to water efficiency. In addition, the refreshed [Green Finance Strategy](#) has set out how the government will build support private and public collaboration over the next 5 years to address barriers to investment.

CCC high-level requirement: There needs to be a focus on governance for cross-government engagement, as well as enablers for private adaptation. Interdependencies across multiple sectors should be recognised. Adaptation should be integrated within other top-level objectives, support net zero and protect biodiversity.

Response: Chapter 1 details how existing or adapted governance structures are in place to support effective management across government, including a consideration of how climate risk interdependencies are managed. Sector chapters of NAP3 also outline governance and engagement plans at a sectoral level (under the 'Coordination' theme). NAP3 will support other government top-level objectives. For example, it will set out a

commitment for Defra to explore options to establish appropriate governance arrangements so the Environment Act 2021 biodiversity targets are delivered in a way that considers a changing climate. The government has also committed to support the flow of private finance into adaptation through the [Green Finance Strategy](#).

CCC high-level requirement: NAP3 should address all CCRA3 risks and opportunities, especially risks from climate change outside of the UK which affects our economy.

Response: NAP3 contains plans and goals for all 61 risks and opportunities identified in CCRA3, including 10 from the international dimension. These will be actively monitored over the 5-year programme period.

CCC high-level requirement: A functional monitoring and evaluation (M&E) framework is required with new and better indicators to measure adaptation outcomes. There should be investment in indicator research, and indicators must be maintained and updated annually. The next round of the Adaptation Reporting Power should extend the requirement to report on climate risk and adaptation to other key organisations.

Response: Chapter 1 sets out the ambition to develop a M&E framework, with further details in Annex 3 setting out the government approach to adaptation. The framework will provide an important means to assess progress and outcomes. Chapter 8 sets out how the adaptation reporting power (ARP) will be expanded in round 4, with further details in Annex 4. This includes a pilot of reporting by local authorities and other areas of scope expansion, in line with the CCC's recommendations following their evaluation of round 3.

CCC high-level requirement: NAP3 must be an evolving 5-year programme, not a single report.

Response: The government will continue to drive action throughout the NAP3 implementation period, monitoring progress and updating its plans as necessary. As part of this Defra and the Cabinet Office, working with HM Treasury, will be working in partnership to provide strengthened governance of climate adaptation in order to support effective and comprehensive implementation across the 5-year programme. We will also continue to work together with the CCC including on plans for CCRA4.

The CCC progress report makes a sum of 94 further recommendations across the 13 identified assets or systems impacted by climate risks. These will be addressed in full by 15 October 2023.

Annex 3: Monitoring, evaluation and learning

3.1 Adaptation policy development

3.1.1 Policy development for NAP3

Defra has worked across government departments to coordinate and facilitate the mainstreaming of adaptation activity. This has included establishing ownership within government for each of the 61 CCRA3 risks and opportunities. Risk owning departments are responsible for developing adaptation plans and evaluating the effectiveness of those plans.

Annex 1 contains the government's response to each of the CCRA3 risks and opportunities. This includes a total of 79 risk action summaries, with actions and delivery mechanisms designed to reach the defined goals. Throughout the NAP3 period, Defra will continue to support teams across government to further develop and implement their adaptation plans.

3.1.2 Future adaptation policy development

Adapting to a changing climate is a dynamic problem involving complex environmental and socioeconomic systems, such as our food or energy systems. As a result policies often cross sectoral and disciplinary boundaries and may need to evolve as our understanding improves or our priorities change. The UK government is therefore committed to continuously updating and refining our approach to adaptation.

Due to the complexity of this challenge, Defra is using a theory of change approach applying the logic of interventions from action to impact to developing adaptation policy.

As described in the [Magenta Book](#), which sets out guidance on evaluation in government, a theory of change captures the reasoning behind how an intervention is expected to work. The main steps involved in achieving the desired outcomes should be explicitly outlined (see Figure 1). Equally importantly, policymakers should clearly define any assumptions made, the quality and strength of the evidence supporting those assumptions, and wider contextual factors. Monitoring, evaluation and learning are fundamental components of this approach and should be used to challenge the assumptions made and support continuous improvement.

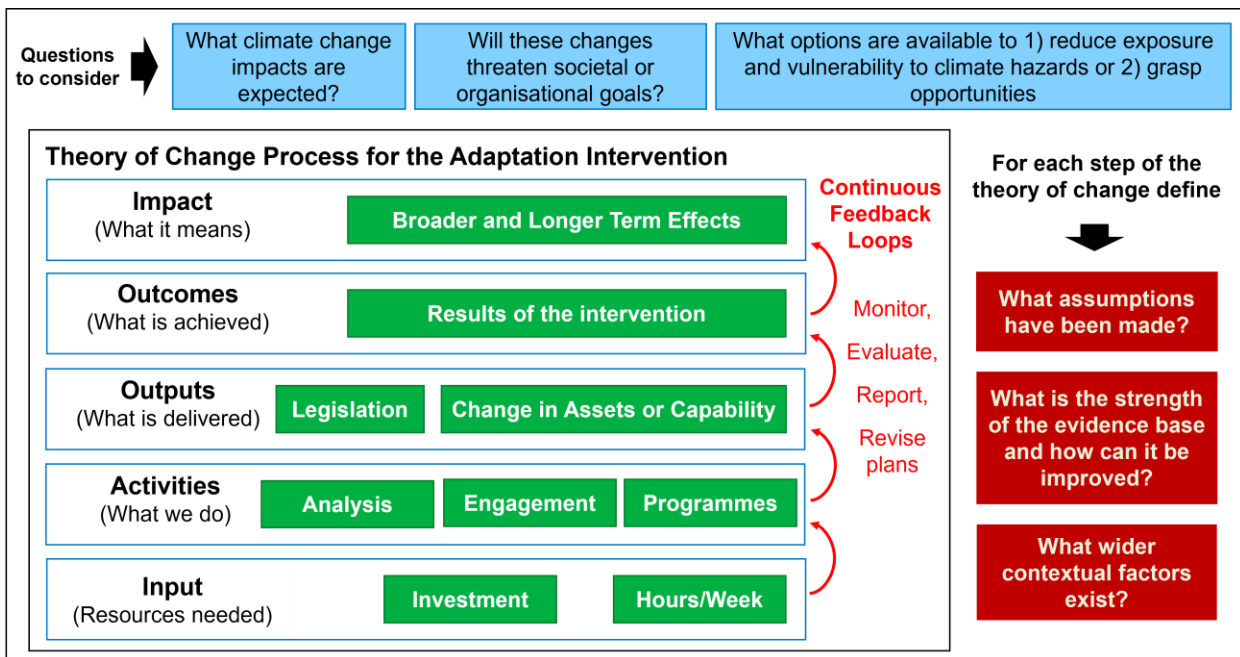


Figure 1: Schematic of the recommended process for developing plans to adapt to climate change through a theory of change approach. Initially, the impacts of climate change and the adaptation options available should be considered. The logical steps of the theory of change approach should then be followed to design an intervention. First, the impact desired should be clearly stated and then the necessary outcomes, outputs, activities and resources required to achieve it. Continuous feedback loops to monitor, evaluate, report and finally revise plans are needed throughout each stage.

3.2 Monitoring and evaluation

The rate and magnitude of climate change will depend on the success of the international community in reducing greenhouse gas emissions. Climate change impacts in the UK are also uncertain due to complex drivers of change within our natural and human systems, such as changing population demographics.

Given these uncertainties, the government is taking an iterative approach to adaptation by learning from what works and applying these insights to future decisions. Effective M&E is important for informing future decision making on adaptation. Defra is aware of the need for more outcome indicators as recommended by the CCC in its [2023 progress report to Parliament](#). M&E can help assess the effectiveness of actions taken, inform resource allocation decisions and reassess goals based on their feasibility or relative importance.

When developing policy responses for the 61 risks or opportunities, policy officials should also identify accompanying process and outcome indicators. Such indicators will help us assess whether:

- a) actions are being delivered
- b) actions are efficient

- c) progress is being made on the declared outcomes

3.2.1 Effective M&E to better understand progress

At present, gaps exist in our ability to monitor our adaptation efforts. This is due to the complexity of adaptation and the associated challenges of identifying and developing appropriate indicators. Defra held a series of sector-specific workshops in spring 2022 focused on the M&E of adaptation in each sector. The workshops brought together data owners, holders and users to share best practice and discuss challenges in developing adaptation indicators. Some of the common challenges included:

- proving cause and effect for adaptation actions in a complex system with multiple drivers of change
- tracking progress to a moving target in a system with interacting and cascading climate and socioeconomic risks
- the mismatch between short evaluation cycles and the time needed to effect change, especially for the natural environment
- access to high quality, affordable and trustworthy data

These challenges are consistent with the findings of the CCC in its [2021 progress report to Parliament](#). Adaptation process indicators (such as the number of plans adopted, or buildings retrofitted) are relatively simple to measure and so more common. Indicators that measure adaptation outcomes (such as climate-sensitive sectors of the economy being better adapted) are rarer as they are harder to measure.

Work is ongoing to identify a suite of existing and potential indicators to evaluate the success of the NAP3 programme. In many cases, indicators will be researched or developed as part of an action. For example, to support a range of infrastructure risks, the Climate Services for a Net Zero World programme will include a focus on the most appropriate approaches or metrics for gas and electricity network companies to measure their climate resilience and monitor progress in adaptation. The Department for Energy Security and Net Zero will use the outputs from research to inform the government's approach to M&E for the sector throughout the NAP3 implementation period and beyond.

Building on these advances, we are designing an M&E framework that will inform the first NAP3 progress report, expected in 2025. To support this process, we have:

- created guidelines for developing M&E for NAP actions (see section 3.2.3)
- created an academic secondment programme to support evidence-based policy development across government, which includes one secondment to support the creation of a NAP3 M&E framework
- established a dedicated Expert Advisory Panel to review plans for and steer the development of the M&E framework for NAP3 and beyond

3.2.2 Typology of indicators

Indicators can refer to different stages of the adaptation process (see Figure 1). Following the Organisation for Economic Cooperation and Development results terminology ([OECD, 2002](#)), it is useful to distinguish between the following indicators.

Output indicators

- Output indicators describe products or services created by adaptation interventions.
- They indicate whether actions have been implemented but do not indicate whether adaptation has been successful.
- Example indicators include:
 - newly adopted regulations
 - training conducted
 - new or upgraded infrastructure

Outcome indicators

- Outcome indicators describe results of outputs.
- They indicate whether actions have increased resilience or lowered climate risks, climate impacts, economic damages or negative effects on human health.
- Example indicators include:
 - a reduction in building permits issued for high flood risk areas
 - whether an adaptation measure has reduced the magnitude of infrastructure service disruptions caused by extreme weather
 - recorded damages from flooding

Climate change impact indicators

- Climate change impact indicators describe impacts attributed to climate change.
- They indicate reductions in climate impacts (or lower increases than would have been the case without adaptation).
- Example indicators include:
 - recorded instances of heat strokes due to hotter summers
 - the extent and magnitude of flooding and drought
 - adverse impacts on ecosystems

Climate change impact indicators can also be adaptation outcome indicators if the measured changes in climate impacts are linked to an adaptation intervention.

3.2.3 Guidelines for the monitoring and evaluation of adaptation

These guidelines for adaptation M&E were developed from themes emerging from Defra-led M&E workshops in 2022, an internal literature review by the Environment Agency and the [AdaptME toolkit](#). Draft guidelines were discussed at an Adaptation Indicator Working

Group which includes cross-government, academic and industry representatives. The revised version below provides a point of reference for the upcoming M&E framework.

- **Clarify the purpose of your evaluation and how results support decision making.** Clearly set out what the evaluation needs to find out (the evaluation questions), how you will know (the indicators) and how the resulting findings can be used to support policy development.
- **Define clear outcomes to measure progress against.** Take time to agree the ultimate outcome. Lack of clarity, or lack of transparency and agreement, can be a barrier to effective and efficient adaptation planning.
- **M&E should be proportionate and realistic.** Be clear about what can be addressed in the M&E, balancing the ultimate ambition with what is feasible given the available time, capacity and budget.
- **Involve those who are influenced by, or have influence on, the M&E process.** Be clear who these stakeholders are and why they might have an interest. Where possible, involve them throughout the M&E design and implementation.
- **View the M&E of adaptation strategies and plans as an iterative, formative process to support continuous improvement.** Given inherent uncertainty in adaptation planning, M&E approaches need to be flexible and designed to support learning and continuous improvement based on what emerges over time.
- **Combine indicators to create a meaningful measurement of progress.** There is no one set of climate change adaptation indicators as adaptation is context specific. It is how a mix of indicators are combined that determines their effectiveness at tracking progress towards the desired goals.
- **Design monitoring and data access to be efficient and cost-effective.** Access to high quality, salient, trustworthy data is core to good monitoring. Having no indicator is better than a bad indicator. The use of existing datasets should be encouraged, and any data limitations should be made explicit at the start. New datasets should comply with the FAIR principles: findable, accessible, interoperable and reusable.
- **Share what you have learnt.** Having defined the audience, determine the purpose, the timing to inform decision making, the level of detail and the preferred formats for communication. Be clear about any limitations in the underlying data and provide opportunities for feedback and discussion on the usefulness of the M&E and how it has been communicated.

3.2.4 Case study: adaptation indicators for risk H12

The NAP3 goal for H12 (risk to health and social care delivery) is to minimise the impact of climate change on the quality, effectiveness and timeliness of health and social care delivery. Different types of indicators have been identified and more may be developed.

Climate change impact indicator

- The level of service disruption in health and social care resulting from severe weather events, such as reported overheating incidents.

Output indicators for individual actions

Output indicators to show progress in delivering on specific actions committed to for risk H12:

- The percentage of National Health Service (NHS) Trusts completing Climate Change Risk Assessment (CCRA tool)
 - Tied to Action 1: NHS England will develop an interactive climate change risk assessment tool by 2025 to support the identification of local climate change risks to NHS sites and key services to inform adaptation planning.
- The number of NHS Trusts and Integrated Care Integrated Boards (ICB) that have incorporated adaptation into Green Plans
 - Tied to Action 2: NHS England will strengthen adaptation provisions within the NHS Green Plan guidance by 2025 to support all Trusts and ICBs to include adaptation measures in individual Green Plans by 2027.
- Evaluation shows eligible building works (excluding derogations) on new and existing NHS facilities align with the building standards
 - Tied to Action 3: NHS England will include adaptation measures in the NHS standard contract for NHS buildings and services from 2023, and include adaptation measures within NHS building standards to increase the uptake of adaptation planning and activity.
- The proportion of providers subscribed to extreme weather alerts.
 - Tied to Action 4: The UK Health Security Agency published the Adverse Weather and Health Plan on 27 April 2023, which came into effect on 1 June 2023. This will provide guidance to reduce the health risks associated with adverse weather events and support the uptake of prevention actions across the health and social care sector and in local communities.

Annex 4: Adaptation Reporting Power fourth round scope

4.1 Energy

4.1.1 Energy generation

We will work with Energy UK to determine a proportionate approach to reporting by energy generating companies across the whole sector (including renewables), building on the last round's sectoral overview.

4.1.2 Electricity

We will invite the companies responsible for electricity transmission and distribution in Scotland, England and Wales to report. We will invite the Energy Networks Association to update their sectoral overview. We will explore the potential to invite other major elements of the electricity system to report.

4.1.3 Gas

We will invite the gas distribution network ownership groups in Scotland, England and Wales to report. We will explore the potential to invite other major elements of the gas system to report.

4.1.4 Energy regulators

We will invite Ofgem to report and explore reporting by other relevant regulators.

4.2 Water

4.2.1 Water companies

We will invite water companies in England serving over 50,000 billed premises to report.

4.2.2 Water regulator

We will invite Ofwat to report.

4.2.3 Canals and rivers

We will invite the Canal and River Trust to report. We will request additional reporting from the Environment Agency on their canal and river activities.

4.3 Transport

4.3.1 Roads

We will invite National Highways to report.

4.3.2 Rail

We will invite Network Rail, HS1 and HS2 to report.

4.3.3 Transport authorities

We will invite Transport for London to report. We will explore the potential for reporting by other transport authorities.

4.3.4 Aviation

We will work with the Airport Operators Association to expand reporting by airports in England, Scotland and Wales. We will invite National Air Traffic Service to report.

4.3.5 Transport regulators

We will invite the Office of Rail and Road and the Civil Aviation Authority to report.

4.3.6 Ports

We will work with the British Ports Association and the UK Major Ports Group to expand reporting by ports in England, Scotland and Wales.

4.3.7 Maritime safety

We will invite the UK General Lighthouse Authorities and the Maritime and Coastguard Agency to report.

4.4 ICT

4.4.1 Electronic communications

We will work with the industry's Electronic Communications Resilience and Response Group to determine a proportionate approach to reporting by communications network operators, building on the last round's sectoral overview.

4.4.2 Data centres

We will invite TechUK to report on behalf of data centres.

4.4.3 Communications regulator

We will explore the potential for Ofcom to provide information to the government on climate adaptation, within the extent of their powers.

4.5 Environment

4.5.1 Environmental regulators and public bodies

We will invite the Environment Agency, Natural England and the Marine Management Organisation to report. We will also invite the Forestry Commission to report, including on the activities of Forest Research and Forestry England (as a landowning and land managing body). We will explore the potential to invite additional environmental regulators and public bodies to report.

4.5.2 Landowners and land managers

We will invite the National Trust and the Wildlife Trusts to report. We will invite the Protected Landscapes to submit a joint report on behalf of National Parks and Areas of Outstanding Natural Beauty. We will explore the potential to invite additional major landowners and land managers of a public nature to report.

4.6 Agriculture and food supply

4.6.1 Fisheries

We will invite Seafish to report.

4.6.2 Agriculture and horticulture

We will invite appropriate bodies with a leadership role in this sector to report.

4.6.3 Drainage

We will explore the potential for the Association of Drainage Authorities to provide climate adaptation information to government on behalf of England's Internal Drainage Boards.

4.7 Heritage

4.7.1 Cultural heritage

We will invite Historic England and English Heritage to report jointly, as well as the National Trust.

4.8 Finance

4.8.1 Financial regulators

We will invite the Prudential Regulation Authority, the Financial Reporting Council, the Financial Conduct Authority, and the Pensions Regulator to report.

4.9 Health

4.9.1 Health and social care

We will invite NHS England and the UK Health Security Agency to report jointly, covering Integrated Care Systems and Trusts. We will explore the inclusion of reporting on locally commissioned public health and social care activities in a pilot of local authority reporting.

Annex 5: Acronyms and glossary

5.1 List of acronyms

ADEPT: Association of Directors of Environment, Economy, Planning and Transport

AONB: Area of Outstanding Natural Beauty

ARP: Adaptation Reporting Power

AWHP: Adverse Weather and Health Plan

BDOUK: Building Digital UK

BREEAM: Building Research Establishment Environmental Assessment Method

CCA 2008: Climate Change Act 2008

CCC: Climate Change Committee

CCF: Continuous Cover Forestry

CCRA: Climate Change Risk Assessment

CNI: Critical National Infrastructure

CO: Cabinet Office

COACCH: CO-designing the Assessment of Climate Change costs

CP: Communication Provider

CS-NOW: Climate Services for a Net Zero Resilient World

DBT: Department for Business and Trade

DCMS: Department for Digital, Culture, Media and Sport

Defra: Department for Environment, Food and Rural Affairs

DESNZ: Department for Energy Security and Net Zero

DfE: Department for Education

DfT: Department for Transport

DHSC: Department of Health and Social Care

DLUHC: Department for Levelling Up, Housing and Communities

DNO: Distribution Network Operator

DSIT: Department for Science, Innovation and Technology

DWI: Drinking Water Inspectorate

EA: Environment Agency

EC-RRG: Electronic Communications Resilience and Response Group

EFIG: Epidemiology of Foodborne Infections Group

EFUS: Energy Follow Up Survey

EIP: Environmental Improvement Plan

ELMs: Environmental Land Management Schemes

EPC: Energy Performance Certificate

EPR: Environmental Permitting Regulations

ESOS: Energy Savings Opportunity Scheme

FC: Forestry Commission

FCA: Financial Conduct Authority

FCDO: Foreign, Commonwealth and Development Office

FCERM: Flood and Coastal Erosion Risk Management

FCP: Farming and Countryside Programme

FRC: Financial Reporting Council

FSA: Food Standards Agency

GCB: Green Construction Board

GDP: Gross Domestic Product

GEOGLAM: Group on Earth Observations Global Agricultural Monitoring Initiative

GFS: Green Finance Strategy

GIN: Genetic Improvement Network

HECC: Health Effects of Climate Change

HUG: Home Upgrade Grant

HSE: Health and Safety Executive

ICF: International Climate Finance

IFS: Imported Fever Service

IFRS: International Financial Reporting Standards

INNS: Invasive Non-Native Species

IR: Integrated Review

IWG: Infrastructure Working Group

LA: Local Authority

LAAP: Local Adaptation Advisory Panel

LARA toolkit: Local Authority Risk and Adaptation toolkit

LG: Local Government

LGA: Local Government Association

LINC: Local Investment in Natural Capital

LNRS: Local Nature Recovery Strategies

LRF: Local Resilience Forum

LTP: Local Transport Plan

M&E: Monitoring and Evaluation

MGN: Marine Guidance Notes

MoJ: Ministry of Justice

MPA: Marine Protected Area

MaRePo: Marine Restoration Potential mapping

NAP: National Adaptation Programme

NARM: Network Asset Risk Metric

NCA: National Character Area

NFM: Natural Flood Management

NHS: National Health Service

NI: Northern Ireland

NICCAP: Northern Ireland Climate Change Adaptation Programmes

NMDC: National Model Design Code

NPA: National Park Authority

NPPF: National Planning Policy Framework

NRN: Nature Recovery Network

NRP: Nature Recovery Project

NSRA: National Security Risk Assessment

NTS: National Transmission System

NUAR: National Underground Asset Register

OECD: Organisation for Economic Co-operation and Development

Ofcom: The Office of Communications

Ofgem: The Office of Gas and Electricity Markets

Oflog: Office for Local Government

Ofwat: Water Services Regulation Authority

ONS: The Office for National Statistics

ORR: Office of Rail and Road

PAS: Publicly Available Specifications

PPG: Planning Practice Guidance

PR: Price Review

PRA: Prudential Regulation Authority

PSTN: Public Switched Telephone Network

RBMP: River Basin Management Plan

ReMEDIES: Reducing and Mitigating Erosion and Disturbance Impacts Affecting the Seabed

ReMeMaRe: Restoring Meadows Marsh and Reef

RIS: Road Investment Strategy

RMA: Risk Management Authority

RSPB: Royal Society for the Protection of Birds

RSSB: Railway Safety and Standards Board

SAP: Standard Assessment Procedure

SCCAP: Scottish Climate Change Adaptation Programme

SDR: Sustainable Disclosure Requirement

SFI: Sustainable Farming Incentive

SHDF: Social Housing Decarbonisation Fund

SMP: Shoreline Management Plan

SPS: Special Purpose Ships

SR: Spending Review

SRN: Strategic Road Network

SSSI: Sites of Special Scientific Interest

TCFD: Task Force on Climate-related Financial Disclosures

TNFD: Taskforce for Nature-related Financial Disclosures

TPT: Transition Plan Taskforce

UK: United Kingdom

UKHSA: UK Health Security Agency

UKRI: UK Research and Innovation

UKRLG: UK Roads Leadership Group

UN: United Nations

VBD: Vector-Borne Disease

VoIP: Voice over IP technology

WRMP: Water Resource Management Plan

5.2 Glossary of terms

Adaptation Research Alliance – promotes action-orientated research to inform effective adaptation to reduce the risks from climate change, particularly for countries and communities that are most vulnerable, at the scale and urgency demanded by the science. The Adaptation Research Alliance is a global, collaborative, multi-stakeholder effort, including funders and researchers, to increase investment and opportunities for action research and develop effective adaptation solutions.

Adaptive capacity – the ability of systems, institutions, humans and other organisms to adjust to potential damage, take advantage of opportunities, or respond to consequences.

Adaptive management – a process of iteratively planning, implementing and modifying strategies for managing resources in the face of uncertainty and change. Adaptive management involves adjusting approaches in response to observations of their effect on, and changes in, the system brought on by resulting feedback effects and other variables.

Carbon sequestration and storage – the process by which carbon dioxide is removed from the atmosphere and stored in such a way that it is unable to affect the atmosphere, with the aim of mitigating the effects of global warming.

Cascading impacts – these occur when impacts in one or more parts of an interconnected system may trigger impacts in other parts of the system. For example, a flood can cause direct damages to buildings, but also have knock-on effects on people's mental health, business continuity and supply chains.

Climate change – a change in the climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods.

Climate impacts – effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health status, ecosystems, economic, social, and cultural assets, services (including environmental), and infrastructure. They are due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes.

Climate risk – the potential for adverse consequences of a climate-related hazard, or of adaptation or mitigation responses to such a hazard, on lives, livelihoods, health and

wellbeing, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure.

Climate proofing – ensuring that all actions have been considered for climate adaptation and that relevant actions are done in the right place, in such a way that they are resilient to future climate change.

Critical National Infrastructure – Critical National Infrastructure includes facilities, systems, sites, information, people, networks and processes which are necessary for a country to function and upon which daily life depends. It also includes some functions, sites and organisations which are not critical to the maintenance of essential services, but which need protection due to the potential danger to the public (civil nuclear and chemical sites for example). Critical National Infrastructure is a subset of National Infrastructure which, if damaged, would have major impacts on a national scale.

Criticalities process – the methodology through which the government collects data on Critical National Infrastructure to understand and manage the risks it faces.

Electricity distribution – in England and Wales, this is the wires, cables and other network infrastructure that typically operate at 132kV and below, while in Scotland it is the infrastructure that operates below 132kV. Distribution networks carry electricity from the transmission system and distributed generation to industrial, commercial and domestic users.

Delivery mechanism – a programme or strategy through which adaptation actions are carried out.

Electricity generation – electricity generated from fossil fuels, nuclear power plants, hydro power plants (excluding pumped storage), geothermal systems, solar panels, biofuels, and wind.

Electricity transmission – the system consisting of high-voltage electric wires owned or operated by organisations that are granted permission to transmit electricity within Great Britain and offshore. Electricity is transmitted from power stations to sub-stations, or between sub-stations, or to or from external interconnection.

Environmental goods and services – areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources.

Goods and services – the output of an economic system. Goods are tangible items sold to customers, while services are tasks performed for the benefit of the recipients.

Infrastructure operators – all those owning and operating infrastructure services, systems or assets.

Infrastructure resilience – the capacity of infrastructure assets and networks to cope with a hazardous event (such as high rainfall) or trend (such as climate change), responding or reorganizing in ways that maintain their essential function and services while also maintaining the capacity for adaptation, learning and transformation.

Monitoring and evaluation – mechanisms put in place to respectively monitor and evaluate efforts to adapt to the impacts of climate change with the aim of systematically identifying, characterising and assessing progress over time.

Monopoly – a market with a dominant supplier who sets price and determines other characteristics of a good.

Natural monopoly – a monopoly which arises for various desirable reasons. For example, in markets with high fixed costs, a single big company can be most efficient.

Nature-based solutions – actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human wellbeing and biodiversity benefits.

Net zero – the 'net zero target' refers to a government commitment to reduce the UK's greenhouse gas emissions by 100% from 1990 levels by 2050.

Paludiculture – farming wetland crops, such as reed or sphagnum moss, on rewetted peatland.

Precision breeding – developing plants and animals using modern biotechnology, such as gene editing. This applies only to genetic changes which could have occurred naturally or through traditional breeding methods.

Price control – the price and service package that is defined through the Price Review process.

Price control deliverable – a mechanism to capture a water company's outputs that are directly funded through the price control and where the funding provided is not transferrable to a different output. The purpose of a price control deliverable is to ensure the conditions attached to the funding are clear upfront.

Price Review – the process of setting the price, investment and service package that customers receive from infrastructure service providers. It includes controlling prices that companies can charge customers.

Protected Landscape – a location that have been designated as either an Area of Outstanding Natural Beauty or a National Park.

Small- and medium-sized enterprises – companies with under 250 staff, and either an annual turnover below £36 million or a balance sheet total below £18 million.

Spatial prioritisation – a process that compares 2 or more actions to identify which action would deliver the optimum environmental benefits.

Spatial targeting – a process that enables a system to indicate to customers which actions are likely to be particularly environmentally beneficial for a given piece of land. It considers one action or ecosystem service at a time and does not compare one action against another.

Statutory protected site – a site of nature conservation importance that receives protection by means of certain legislation in recognition of its biodiversity or geological value.

Systemic risk – a source of risk which, if it materialised in the period ahead, would cause significant loss of confidence in UK financial markets and institutions or disruption to the financial system.

Taskforce on Climate-related Financial Disclosures – consists of types of information that companies should disclose to support investors, lenders and insurance underwriters in appropriately assessing and pricing a specific set of risks related to climate change.