



HM Government

Government response to the Committee on Climate Change

2019 Report to Parliament – Progress in preparing for climate change

October 2019



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Executive Summary

The impact of climate change is clear and demands urgent action.

The UK government is committed to leading the world in tackling climate change; being the first major economy in the world to legislate for a net zero target, whilst also taking vital steps to improve our own resilience. We are demonstrating leadership at a global level on this agenda, driving action as co-lead of the Resilience and Adaptation theme of this year's UN Climate Action Summit. Over the last year the UK has been a convening country for the Global Commission on Adaptation, which has recently launched its flagship report – 'Adapt Now'. There are further opportunities on the horizon, as the UK, in partnership with Italy, received international backing from its UN regional group to host the COP26 global climate summit in 2020. This event will be the UN's 26th climate change conference, and a milestone for ambition: for cleaner energy, a more resilient future and flourishing nature, all supported by green financial systems.

Whilst we accelerate efforts to end our contribution to climate change, we must continue to take robust action to ensure the country is well prepared to face the challenges a changing climate brings.

Here, we set out government's response to the CCC's progress report and recommendations. Government welcomes the CCC's constructive assessment, both its recognition of areas of excellence and progress that has been made, notably on public water supply and rail

infrastructure, as well as recommendations, sectoral scores, and reflections on areas for further development. There are a few areas, which we have indicated within the response, where we have queried the assessment given, or where further work with the CCC will be needed in clarifying and developing in specific areas, such as on monitoring indicators. The government's response highlights a range of important developments which will support progress on these diverse areas over the coming months and years. We acknowledge there is more to be done and government looks forward to working with the CCC and others in further strengthening our preparedness for climate risks and opportunities across sectors.

The second National Adaptation Programme (NAP) was published in July 2018, setting out our strategy for adapting to the climate change that we are already seeing, and that which we might see in the future. It builds on the first NAP, published in 2013, and shows a trajectory of significant progress in embedding consideration of climate change risks and adaptation principles across government policies and programmes.

The second NAP built on the 2018 landmark 25 Year Environment Plan, outlining how we will achieve our ambition to leave our environment in a better state than we found it. The 25 Year Environment Plan recognises that in order to achieve our goals and improve the environment for future generations, mitigating and adapting to climate change is crucial. As well as comprising one of the ten goal areas set out in the Plan, adaptation is embedded

throughout the Plan and within its other goals, such as on ‘thriving plants and wildlife’, and ‘clean and plentiful water’, amongst others. Government has committed to place the 25 Year Environment Plan on a statutory footing, and the new Environment Bill, introduced in parallel, includes ambitious legislative measures to take this commitment forward.

We know that achieving our long-term goals on adaptation will require many steps along an evolving pathway. Our approach must be responsive and informed by the latest evidence and tools. We will continue on that pathway, as we develop, invest and build capacity for adaptation. This includes building on the publication, with the Met Office, of the UK Climate Projections 2018, including new high-resolution local projections released in September 2019, which will provide a key tool to inform government planning and decision-making, as well as helping businesses and individuals to take action to improve resilience. The National Infrastructure Commission has been commissioned to produce a resilience study, to be published in spring 2020, which should support the integration of resilience approaches into infrastructure policies and plans.

Investing in resilience does not only prevent future losses, it also fosters opportunities

by increasing productivity, encouraging innovation and opening up new approaches and partnerships. Diverse examples, highlighted in this response, include:

- **Exploring and supporting the vital role of nature based solutions.** For instance, government is creating or restoring 500,000 hectares of wildlife-rich habitat in England, as part of a Nature Recovery Network. In addition, 41 new Marine Protected Areas (spanning 12,000km²) have been designated this year.
- **Continuing investment in managing floods and coastal erosion.** This includes providing £2.6 billion in flood protection over six years- and will be issuing a new national policy statement on flooding and coastal erosion later this year.
- **Greening our financial sector and strengthening approaches to managing climate-related financial risks,** as supported by the recently published Green Finance Strategy.

Climate change affects us all and adapting to it must be a shared endeavor across society. We need the engagement of all, across government and beyond – industry, local government, the public – as we all work together to strengthen the resilience of our nation in the years ahead.

Introduction

Our climate is changing. Globally each of the last three decades have been warmer than any preceding decade since 1850. Recent observed trends for the UK indicate a warmer and wetter climate, with considerable variability. The Met Office's latest State of the Climate report highlights that ten of the UK's warmest years have occurred since 2002, and six of the ten wettest years, in a record dating back to 1862, have occurred since 1998¹.

The UK is already feeling the impacts of extreme weather and changing climate², and these impacts are going to worsen over time³. The latest UK Climate Projections show an increased chance of warmer, wetter winters and hotter, drier summers in the future with an increase in the frequency and intensity of extremes⁴. For example, by the 2050s, heatwaves such as 2018 and 2003 could become much more common, happening around 50% of the time⁵.

The UK is recognised as a world leader in tackling climate change and we remain committed to meeting the UK's targets and commitments set under the Climate Change Act 2008. In June the overall 2050 target in the Climate Change Act was raised from an 80% reduction from 1990 levels to a net zero

emissions target following advice from the CCC. The UK was the first major economy in the world to set a net zero emissions target in law, to ensure we can leave the environment in a better state for the next generation.

The UK's bid to host the COP26 global climate summit, in partnership with Italy, has received international support from our UN regional group. This will be a keystone event for ambition: for cleaner energy, a more resilient future and flourishing nature, all supported by green financial systems.

The Climate Change Act 2008 provides a legally binding framework to cut UK greenhouse gas emissions as well as a framework for building the UK's ability to adapt to a changing climate. In terms of adaptation to climate change, the act requires:

- **A UK-wide assessment every five years of the risks and opportunities for the UK arising from climate change.** The second UK Climate Change Risk Assessment (CCRA) was published in January 2017 and outlines the UK and devolved governments' views on the key climate change risks and opportunities that the UK faces today⁶. HMG and

¹ Met Office -State of the UK Climate 2018 <https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2019/state-of-the-uk-climate-2018>

² For example, the 2003 heatwave were assessed to have caused 2000 deaths, and the 2015/16 winter storms in Cumbria caused £1.3bn in insurance claims. The below referenced study looked at the impacts events such as these, and calculated a percentage likelihood that events such events are attributable to climate change: <https://iopscience.iop.org/article/10.1088/1748-9326/aa9663/pdf>

³ <https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/temperature/heatwave>

⁴ UK Climate Projections 2018 (UKCP18) <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>

⁵ <https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2018/2018-uk-summer-heatwave>

⁶ UK Climate Change Risk Assessment 2017 <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2017>

the devolved administrations (DAs) are currently working with the CCC on the third CCRA, which will be published in January 2022.

- **A programme for climate change adaptation to address the risks identified in the CCRA to deliver resilience to climate change on the ground.** The second National Adaptation Programme (NAP)⁷, covering England and reserved matters, was published in July 2018 and sets out the UK government's objectives, proposals and policies for responding to the risks identified in the 2017 CCRA .
- **A strategy for use of the Act's Adaptation Reporting Power (ARP),** to invite or direct organisations such as infrastructure providers and key public bodies to report on their climate change risks and what they are doing to address them. In July 2018, alongside the NAP, government published the third Adaptation Reporting strategy. Government is working closely with reporting organisations to ensure that the current cycle of reporting contributes to, and aligns with, our national adaptation programme.

The Act also established the Adaptation Sub-Committee (ASC) of the Committee on Climate Change (CCC)⁸. Its role is to provide

independent advice on the preparation of the UK CCRA, to report biennially to Parliament on the UK government's progress in the implementation of the NAP, and to advise the devolved administrations, as required.

This document mirrors the structure of the CCC's progress report, and adopts the same set of thematic chapters to address each of the CCC's twelve recommendations. The CCC's recommendation one- on developing effective plans, actions and evidence for key areas- covers a wide range of sectors and we have therefore embedded responses within the relevant thematic chapters. The CCC's recommendations have been reproduced within chapters, including their identified departmental owner and timescale for delivery.

The CCC's 2019 assessment of progress on the NAP was published alongside the CCC's annual statutory assessment on progress towards emissions reductions targets. Government is responding in parallel to these two assessments.

The UK's statutory commitments under the Climate Change Act 2008 are unaffected by the decision to leave the EU. Leaving the EU offers a unique opportunity to shape our environment and economy for the benefit of all and government endeavours to do this in a way that promotes adaptation.

⁷ The National Adaptation Programme and the third strategy for climate adaptation reporting (2018) <https://www.gov.uk/government/publications/climate-change-second-national-adaptation-programme-2018-to-2023>

⁸ The CCC is referred to throughout this document. This includes the functions of the ASC.

Chapter 1: Overall progress on adapting to climate change

1.1 Adapting to current and future changes to our climate is vital for the country and economy. Last year marked the tenth anniversary of the UK's world-leading Climate Change Act, which set out the country's climate mitigation commitments, alongside establishing a robust framework for building adaptation capacity. Climate change adaptation is a firm cross-government priority, and this year the UK has further demonstrated leadership on this area, as co-lead on resilience and adaptation at the UN Climate Action Summit (UNCAS) in September in New York.

1.2 Together with our partners at UNCAS the UK launched a global Call for Action which was endorsed by 113 countries, 14 UN agencies and International Financial Institutions (IFI) and 73 organisations⁹, with more expected to follow, focusing on three areas:

- responding to immediate climate impacts and providing support to the most vulnerable members of society;
- building resilient futures by putting climate risk at the centre of decision making;
- increasing the availability of adaptation and resilience finance.

1.3 We additionally launched, a private sector led coalition, the Coalition for Climate Resilient Investment, comprised of companies, countries and IFIs around the world¹⁰ to put

a value on climate resilience to incentivise resilient infrastructure investments.

1.4 The structure of the second NAP follows that of the second CCRA evidence report, to demonstrate a clear connection between risks and actions. It is organised around the same chapters and actions, relating to the natural environment, infrastructure, people and the built environment, business and industry, and local government. In its 2017 Progress Report the CCC recognised the benefits the first NAP had delivered and the progress that had been made through its implementation. The second NAP builds on the success of the first, and pledges further action to increase the nation's resilience to climate change.

1.5 The CCC's 2019 Progress Report provides 12 recommendations and 33 scores on progress in specific sectors or policy areas. These scores were assessed using parameters such as the degree of consideration of climate risks within government plans, and evidence showing these plans' success. The report highlights areas of excellence as well as providing several cross-cutting reflections on areas it identifies for further development, such as; expanding the coverage of CCRA risks addressed (including international risks); improving the measurability of NAP actions; and strengthening coordination and governance of adaptation measures. Government welcomes the CCC's constructive comments, and

⁹ A Call for Action: Raising Ambition for Climate Adaptation and Resilience https://www.adaptation-undp.org/sites/default/files/uploaded-images/call_for_action_on_adaptation_and_resilience_cas_230919.pdf

¹⁰ Coalition for Climate Resilient Investment (CCRI) Launch https://www.adaptation-undp.org/sites/default/files/uploaded-images/coalition_for_climate_resilient_investment_cas_launch_.pdf

recognises there is scope to do more and we will continue to reflect on areas where we can strengthen our approach.

1.6 The second NAP is a cross-departmental collaboration, bringing together government's policies on managing climate change risks. It sets out actions to address priority national climate risks, but does not seek to cover risks arising from overseas. Government has international security, humanitarian and development processes in place to respond to threats and challenges materialising overseas, including risks from climate change. These include the Government's publicly available National Risks Register of Civil Emergencies (NRR), which identifies climate change as a long-term trend likely to change the country's overall risk landscape in the coming decades. The NRR specifically refers to flooding and heatwaves, two of the priority risks identified in the CCRA, as being particularly effected by climate change, though numerous other risks included in the document could also be impacted to varying extents. In addition Government's Global Strategic Trends (GST) programme assesses the increasing disruption and cost of climate change as one of its areas of focus. The GST is a tool used by the Ministry of Defence and other departments developing long term plans, strategies and policies¹¹.

1.7 The UK is a leading provider of International Climate Finance (ICF) and has committed to providing £5.8 billion in ICF between 2016 and 2020, with at least £1.76 billion being spent in 2020/21. This has helped more than 57 million people to cope with the increased risk of droughts and floods, and other effects of climate change¹². On 23 September at UN

Climate Action Summit, the Prime Minister announced that the UK would be doubling ICF spend, to at least £11.6 billion over the period 2021-2025¹³. This will accelerate the take up of low carbon technologies, help countries and communities most vulnerable to the damaging effects of climate change to become more resilient and prepare for its impacts, and preserve vital biodiversity and ecosystems.

1.8 The second NAP sought to improve the measurability of actions, setting clearer long-term objectives for individual sectors alongside the current actions, which we continue to monitor¹⁴. The link to the 25 Year Environment Plan monitoring processes is provided in Chapter 2.

1.9 Government departments, agencies and arm's length bodies continue to work closely together to increase the nation's resilience to climate change, and to ensure a joined up approach in delivering actions in the NAP. Government is exploring opportunities to further raise the profile and strengthen the governance of cross-government action to adapt and build resilience to climate change.

1.10 As part of ensuring that adaptation is embedded in policy and programme decisions, the Green Book Supplementary Guidance on Accounting for the Effects of Climate Change is being revised to include updated information on climate evidence and assessments. This guidance will be an important tool in supporting departments to meet the Green Book requirement to fully consider climate impacts in policy and programme decisions.

¹¹ Global Strategic Trends (GST) programme https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/771309/Global_Strategic_Trends_-_The_Future_Starts_Today.pdf

¹² UK International Climate Finance funding contributes towards all delivering all four aims of the UK aid strategy: strengthening global peace, security and governance; strengthening resilience and response to crises; promoting global prosperity and tackling extreme poverty and helping the world's most vulnerable <https://www.gov.uk/guidance/international-climate-finance> Latest ICF results: <https://www.gov.uk/guidance/international-climate-finance>

¹³ <https://www.gov.uk/government/news/uk-aid-to-double-efforts-to-tackle-climate-change>

¹⁴ The CCC published government's own monitoring tool for National Adaptation Programme actions as Annex A of their adaptation progress report to parliament in July 2019. This provides the latest progress updates from owners of NAP actions (version valid as of Spring 2019). <https://www.theccc.org.uk/wp-content/uploads/2019/07/Appendix-A-NAP-action-updates-2019.xlsx>

1.11 Partnership remains essential. Government continues to engage widely – including with business, local government, research bodies and the public – as we work together to strengthen the resilience of the nation. Recent examples include:

- Working closely with local government, Defra hosts the Local Adaptation Advisory Panel (LAAP), a forum for dialogue on climate change adaptation between local authorities, central government and delivery bodies. This has recently supported the production of a guide on adaptation for local government¹⁵, produced with the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) and the LAAP.
- Engaging with the Infrastructure Operators Adaptation Forum (IOAF), a network coordinated by the Environment Agency. The Forum enables learning and the sharing of best practice on actions to reduce vulnerability and realise opportunities around interdependencies between infrastructure systems.
- Supporting and building capability of organisations reporting under the third cycle of the Adaptation Reporting Power (ARP), which opened in January 2019 and runs until Jan 2021. Over 90 organisations have confirmed their participation so far, including for the first time all four financial regulators.
- Working with external partners on the next Green GB and NI Week in early 2020, to raise awareness on local climate impacts and action as well as to highlight the opportunities and challenges of reducing our emissions to net zero. Government is also working with the Youth Steering Group as part of their review of policy priorities for environmental action, including climate change, waste and recycling, and biodiversity. The Youth Steering Group is also providing recommendations on how to engage with young people more broadly in the future on these policy areas.
- Continuing support to cutting-edge climate science. Last year Defra and BEIS, as co-sponsors of the Met Office Hadley Centre, supported the launch of an updated set of UK Climate Projections – UKCP18¹⁶. In September this year these were followed by the launch of local projections, the first national climate projections in the world to provide locally relevant climate change information on a similar resolution to that of weather forecast models (2.2km). These will provide a key tool to help government, businesses and the public understand the future climate and enable them to make climate-resilient decisions.
- Working closely with the new £18.7 million UK Research & Innovation and Met Office Strategic Priority Fund (SPF), on Climate Resilience, to ensure it achieves its aims to be multidisciplinary and addresses research gaps identified in the second CCRA.

¹⁵ ADEPT, Defra and Local Adaptation Advisory Panel (2019) Preparing for a Changing Climate: Good Practice Guidance for Local Government <https://www.adeptnet.org.uk/system/files/documents/Good%20Practice%20Guide%20ADEPT%202019f.pdf>

¹⁶ UK Climate Projections (UKCP18) www.metoffice.gov.uk/research/collaboration/ukcp

Chapter 2: Natural Environment

2.1 Our lives and livelihoods depend on our natural environment and the benefits it provides – from timber, food and clean water to pollination, carbon storage, heritage and wildlife.

2.2 Within the second National Adaptation Programme (NAP), Government set out a vision to promote a ‘natural environment with diverse and healthy ecosystems, which is resilient to climate change, able to accommodate change, and valued for the adaptation services it provides’. Alongside this, it seeks to promote ‘profitable and productive agriculture and forestry sectors that take the opportunities from climate change, are resilient to its threats and contribute to the resilience of the natural environment by helping to maintain ecosystem services and protect and enhance biodiversity’.

2.3 Government is taking forward actions to deliver this vision to improve our natural environment, and harness the environmental and climate benefits that nature based solutions can provide. This includes creating a Nature Recovery Network to support an expanding and increasingly connected area of wildlife-rich habitat. Government has committed to place the 25 Year Environment Plan on a statutory footing. The Environment Bill includes ambitious legislative measures to take direct action to address the biggest environmental priorities of our age, many of which are linked directly to climate change. There will be a legal duty on government to set out its plans to improve the natural

environment, and monitor and report annually to parliament on progress towards these.

Recommendation: Plans, Actions and Evidence for Farmland Species and Habitats

Recommendation 1: for action by 2021 (Owner: Defra)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] farmland species and habitats [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

2.4 Government is working in partnership with conservation organisations to recover farmland species. For instance, Natural England are working with a range of partners on ‘Back from the Brink’, a £7.7m programme which aims to put 100 threatened species on the road to recovery by 2020. Parts of this programme aim to recover and conserve arable habitats, reintroduce and manage arable species, and reconnect people with the farmed environment and wildlife.

2.5 Government is also investing in agri-environment schemes to encourage farmers to provide more and better habitat for wildlife and have simplified Countryside Stewardship to facilitate this. We continue to support the ‘Wild Pollinator and Farm Wildlife Package’, which has had notably successful uptake, to make it easier for farmers to provide

flower rich margins, seed for farmland birds, or pollen and nectar plots for insects. 'Wildlife Offers' for particular farm types were also introduced in 2018, for agreements starting in 2019.

2.6 Government is committed to enhancing understanding of predicted species range shifts and changes to habitat composition in response to a changing climate. Natural England, in partnership with the University of Gloucester, are undertaking a Monitoring and Evaluation project to improve our understanding of the impact of both gradual change and extreme events on the ability of agri-environment schemes to deliver environmental objectives.

2.7 Parallel to this, Natural England and the RSPB are publishing a revised edition of the Climate Change Adaptation Manual. This provides a synthesis of the evidence and practical guidance on adaptation for the natural environment. This evidence will better enable us to make effective plans to respond to climate change risk, including over long time frames.

2.8 Government is also reducing pressures on farmland species from other sources, so that they are less vulnerable to climate change pressures. We protect many of our most threatened native species through the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulation 2017. Tougher restrictions have been implemented on the use of three neonicotinoid pesticides based on growing scientific evidence that they are harmful to bees and other pollinators.

2.9 Government recognises that greater progress is required in implementing plans for adapting to climate change risks to farmland habitats and species. The 25 Year Environment Plan marks a step up in our ambition. In the

Plan, a commitment was made to replace Biodiversity 2020¹⁷ which sets out targets for improving and extending habitats, with a new Strategy for Nature to take forward domestic goals for wildlife and our international commitments under the Convention on Biological Diversity. Government would welcome advice from the CCC as part of the development of this strategy.

2.10 As the cornerstone of future agricultural policy, the Environmental Land Management (ELM) scheme will pay public money for public goods, including mitigation of and adaptation to climate change. A key part of this contribution will be measures to improve the condition and extent of habitats and enhance the status of species to ensure resilience or reduced vulnerability of the natural environment to climate change. Government is collating evidence and working closely with stakeholders to determine the climate change adaptation measures that ELM should pay for.

2.11 Government acknowledges the CCC's wider sectoral assessment of the UK's terrestrial and freshwater habitats, and its recommendation to extend condition targets to all priority habitats beyond Protected Areas. Work on achieving goals for habitats and species under the 25 Year Environment Plan is underway: government has begun work to create or restore 500,000 hectares of wildlife-rich habitats outside of PAs, as part of a Nature Recovery Network. Government's approach will be articulated further in the new Strategy for Nature.

2.12 Government supports the need for appropriate monitoring of soil health, function and carbon and appropriate approaches to the sustainable management of soils. For example, government will be publishing a new England Peat Strategy, which will explain how, over the next 25 years, we will improve the condition of peatlands, so that

¹⁷ Biodiversity 2020: A Strategy for England's wildlife and ecosystem services: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>

they function better for the climate, wildlife and people. We recognise the importance of ensuring mitigation and adaptation measures work in synergy, including through peatland restoration and woodland planting.

RECOMMENDATION: Plans, Actions and Evidence for Agricultural Productivity

Recommendation 1: for action by 2021 (Owner: Defra)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] agricultural productivity [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

2.13 Government is committed to further improving our understanding of the risks that climate change poses to agricultural productivity, including through working with the Met Office Hadley Centre. Insights from the UK Climate Projections (UKCP18) are offering bespoke analysis on the likely impacts on climate change on global crop yields. The Hadley Centre's recent improvements in regional scale analytical capabilities under UKCP18 will also help us better align Defra's crop breeding Research and Development (R&D) with climate change pressures.

2.14 Government is supporting research to promote agricultural resilience, such as a major, long-term research platform for the genetic improvement of arable crops and fresh produce (Genetic Improvement Networks). We are awarding £5.5 million for the period between 2018 and 2023 to help improve the productivity and resilience of the arable sector; reduce its environmental impact and increase economic potential.

2.15 Government is also striving to empower farmers. A policy statement, introduced alongside the Agriculture Bill, set out our

plans for an ambitious R&D package which will enable more farmers and agri-food businesses to engage. We also provide advice to farmers via the Farming Advisory Service, which includes advice for water abstraction and consumption in the drier extremes of the year, which are predicted to become more common.

2.16 Under the Transforming Food Production (TFP) Initiative (run by UK Research & Innovation), a public investment of £90 million will be made over four years to support rapid development and deployment of advanced precision agricultural solutions that will enable optimum use of resources (e.g. water and nutrients) and enable more effective decision making. The programme will cover Crop Production and Farmed Animal Production systems (including aquaculture) and focus on four major challenges to productivity, including resilience to climate variation, and biotic stress management. The first TFP competition for collaborative R&D had two themes:

- To drive productivity and improve environmental outcomes in crop and ruminant production systems.
- To develop new, highly efficient, high-value food production systems that maximise productivity and improve environmental performance.

RECOMMENDATION: Plans, Actions and Evidence for Commercial Fisheries and Aquaculture

Recommendation 1: for action by 2021 (Owner: Defra)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] commercial fisheries and aquaculture [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

2.17 Government has been working to mitigate the impacts of climate change by increasing the resilience of our fish stocks through fisheries management measures and understanding the impacts of potential changes in stock distributions. This has been set out in the Fisheries White Paper which contains a clear commitment for increasing the sustainability of our management practices, including on stock resilience, climate change and building on a range of research programs to inform policy.

2.18 The CCC correctly described the Fisheries Bill as a “framework Bill”, which is important as it gives us the powers to manage our own fisheries post EU exit. The Fisheries Bill also contains objectives for increasing sustainability of our fisheries and increasing resilience to climate change. These include an ecosystem approach to management and achieving and maintaining Maximum Sustainable Yield (MSY) in stocks, which are key to building resilience in our ecosystems.

2.19 Thanks to the UK’s influence and our commitment to a science-based approach, we have made substantial progress towards stocks being fished at MSY. We are pleased to see the graphic on page 98 of the CCC’s report, which demonstrates improvements made to the health of fish stocks. However, it only shows figures until 2016, whereas we continue to improve. In 2019, 29 stocks of interest to the UK were fished at or below their MSY, out of 45, compared with 25 in 2016. We recognise that further efforts are needed to ensure all stocks are rebuilt and managed at least at MSY levels.

2.20 Government, its agencies, arm’s length bodies and partners are conducting multiple research projects into climate change and potential impact on fishing and aquaculture. Under the Adaptation Reporting Power, bodies such as CEFAS and SEAFISH are reporting

on climate change impacts in the wild capture fisheries sector, and have issued yearly “watching brief”¹⁸ documents on this topic.

2.21 Government continues to adopt marine planning and use Marine Protected Areas (MPAs) to ensure the sustainable development of aquaculture within marine areas and limit fishing in vulnerable areas. The UK also has long-established disease surveillance and management measures to ensure aquaculture businesses limit the impacts of disease; an issue which may grow due to climate change, as mentioned in the CCC’s report.

2.22 Government also welcomes the CCC’s assessment on the resilience of UK coastal and marine habitats and species to climate change. The government’s Marine Plans take into account risks from climate change and include clear objectives and policies to address them. The UK Marine Strategy Part 1 reported on spatial and temporal variations of sea surface temperature, salinity and pH that effects UK waters. We have provided a projection on how these variables could be affected by climate change and the impacts on marine ecosystems. All plans are reviewed within a three-yearly cycle, and so as our understanding improves, we will use it to inform future policy and build resilience into decisions.

2.23 Government recognises the crucial role of nature based solutions for climate mitigation and adaptation, including MPAs designation, and protection and restoration of coastal habitats, including seagrass and saltmarsh. We have joined the Blue Charter Marine Protected Area action group. In May 2019, following a formal public consultation on new Marine Conservation Zones, 41 new sites were designated, safeguarding 12,000km² of marine habitat in England. Condition assessments of MPAs consider impacts from climate change where they influence feature attributes, but it can be difficult distinguishing

¹⁸ Seafish- Watching Brief: Climate Change adaptation <https://www.seafish.org/article/climate-change-adaptation>

this from other anthropogenic impacts. Government continues to develop methods to assess climate change impacts on MPAs.

2.24 Government agrees with the CCC's emphasis on the importance of data in areas beyond Marine Protected Zones. The updated UK Marine Strategy Part 1 assesses of all UK waters, including the extent and condition of benthic habitats outside of MPAs¹⁹ and in many cases notes the role of a changing climate in these assessments. The Intertidal Community Index²⁰ assesses intertidal species community response to changes in temperature.

2.25 The report highlights concerns about the UK's departure from the EU. Post-exit we will continue to implement the Marine Strategy Regulations and replicate further obligations under the Marine Strategy Framework Directive and ensure its continuing operability in UK law, primarily through the Marine Environment (EU Exit) (Amendment) Regulations 2018. The new Office for Environmental Protection will fulfil the function currently undertaken by the European Commission (see paragraph 2.29).

RECOMMENDATION: Developing priority indicators for adaptation

Recommendation 2: for action by the end of 2019 (Owner: Defra)

Additional priority indicators are required to guide and allow evaluation of adaptation actions and impacts, and to ensure effective use of taxpayers' money. Defra, in its response to this report, should set out where suitable data are already being collected, and a process for working with the ASC and other organisations to design and populate the indicators.

2.26 As part of its commitment to report on progress on the 25 Year Environment Plan,

this year the government has published the Plan's Outcome Indicator Framework. This consists of 66 indicators that will facilitate understanding of the outcomes of changes to our natural capital assets, their benefits and the pressures on them. The Framework is ambitious, with many indicators requiring further development. We recognise that other indicators will be helpful to address specific sector, spatial and policy needs. Work to develop these and to bring coherence to the full constellation of indicators will need to progress across government.

2.27 The CCC's progress report describes 38 indicators that it considers are needed to guide adaptation action, with 20 related to the natural environment. Several could inform the development of indicators under the Outcome Indicator Framework that government has plans to develop over the next three years, such as for 'soil carbon, erosion and condition for flood risk' and 'climate sensitive species'. Others may need to be considered as sector-level indicators, such as 'tree loss due to extreme weather', 'vulnerability of the aquaculture sector', or 'crop resilience research'. Many indicators suggested are complex and would require significant technical work and new scientific understanding.

2.28 The 25 Year Plan's Outcome Indicator framework is set out to measure overall change to the system, of which climate change will be a factor. Within the Framework government has identified a suite of indicators particularly relevant to assessing needs and progress on climate change adaptation. Further technical discussions will be necessary to determine the best way to integrate the CCC's recommendations with ongoing indicator development and reporting work related to the 25 Year Environment Plan. Development of several of the other more sector specific

¹⁹ Summary of progress towards Good Environmental Status: <https://moat.cefas.co.uk/summary-of-progress-towards-good-environmental-status/>

²⁰ Intertidal Community Index: <https://moat.cefas.co.uk/biodiversity-food-webs-and-marine-protected-areas/benthic-habitats/intertidal-community-index/>

sectoral (or non-environment) indicators suggested by the CCC will need to be progressed at policy level. Government would welcome the input of the CCC in discussions towards indicator development.

2.29 In 2018, Natural England and the British Ecological Society held a workshop at Cambridge University to develop appropriate indicators and metrics to determine the effectiveness of adaptation interventions. They are in the process of publishing a review of the different assessment approaches.

RECOMMENDATION: Integrating adaptation into 25 Year Environment Plan goals and Environmental Land Management Scheme (ELM) outcomes.

Recommendation 4: for action by 2022 (Owner: Defra)

Adaptation must be integrated systematically into the 25 Year Environment Plan goals and the Environmental Land Management scheme (ELMs) outcomes.

Actions that reduce vulnerability and exposure to climate change related to any of the environmental outcomes should be rewarded under ELMs. The Adaptation Committee will evaluate progress in adaptation related to the goals set out in the 25-year Plan, and report on this to the Office for Environmental Protection when it has been set up; including but not limited to terrestrial and freshwater habitats and species; fisheries; and soil health.

2.30 Mitigating and adapting to climate change is one of the ten goals in 25 Year Environment plan, reflecting the importance of these aims to environmental improvement as a whole. Government agrees that it is important to ensure climate change adaptation is fully embedded across the 25 Year Environment Plan goals. Having a clear understanding of the impact of climate risks is fundamental to

achieving the goals in the 25 Year Environment Plan. For example, to achieve clean and plentiful water, we will need to reform our approach to water abstraction to increase drought resilience.

2.31 The goal of mitigating and adapting to climate change has not been viewed in isolation, and adaptation measures are embedded throughout the plan. For example as part of Government's commitment to achieving a natural environment in which plants and wildlife thrive, 75% of the UK's one million hectares of terrestrial and freshwater protected sites will be restored to favourable condition by 2042. This will help build the resilience of plants and wildlife to climate change.

2.32 The 25 Year Environment Plan proposed the launch of a new Office for Environmental Protection (OEP), which will have a statutory duty to monitor progress in improving the natural environment. It will also have a discretionary duty to consider whether progress could be improved. A key milestone is the new Environment Bill, introduced in October, which will establish the OEP.

2.33 Government welcomes the offer for the CCC to send their views on progress with adaptation, as reported in the 25 Year Environment Plan annual report, to the OEP. Once the OEP is set up, the strategy will need to set out how it will avoid any overlaps with the CCC in its strategy. It is expected to do this in collaboration with the CCC and the bodies may also agree to set up a MoU. The strategy could include how the two bodies will share information; such as how the OEP will receive reports and other evidence from the CCC. These will be considered alongside the other information the OEP has gathered for its annual progress reports. The OEP will work closely with the CCC to ensure climate and environmental legislation is respected once the UK leaves the EU.

2.34 Government is also in agreement that climate change adaptation must be integrated systematically into the Environmental Land Management Scheme (ELM). The new ELM scheme will support land managers to adopt land management interventions that enhance the natural environment's resilience to climate change. This could include, for example, reduced risk of harm from hazards such as flooding and drought. Government will continue to develop this important policy, which will contribute to the delivery of the adaptation goals in the 25 Year Environment Plan and National Adaptation Programme.

Chapter 3: Infrastructure

3.1 Infrastructure for energy, water, transport and communications, underpins activities across society and the economy, yet may be directly or indirectly vulnerable to climate change risks. The second CCRA identifies the key climate risks to infrastructure, including from groundwater flooding, coastal flooding and erosion, embankment failure, high winds, lightening as well as cascading failures from infrastructure interdependencies.

3.2 In the second National Adaptation Programme (NAP), government set out a vision to develop an infrastructure network that is resilient to today's natural hazards and prepared for the future changing climate. This requires action from stakeholders across the sector. Providers need to minimise climate risks to existing assets; new infrastructure needs to account for climate change over asset lifetimes; and emergency planners need to understand vulnerabilities of infrastructure to extreme weather.

3.3 Good progress is being made across a wide range of infrastructure sectors, notably water, rail and road, but government acknowledges the need to make further progress to strengthen this resilience. The CCC's two linked recommendations on the infrastructure sector are responded to collectively below.

RECOMMENDATION: Planning for and addressing infrastructure interdependencies and data sharing arrangements

Recommendation 1: for action by 2021 (Owner: Cabinet Office, Defra, other government departments)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] infrastructure interdependencies [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

Recommendation 11: for action by the end of 2019 (Owner: Cabinet Office, Defra)

It remains unclear what action is being taken to reduce the climate risks related to infrastructure interdependencies. Cabinet Office should ensure that data sharing arrangements are in place between infrastructure providers and Local Resilience Forums, and provide evidence to the ASC that this is happening.

The Government should also ensure that the Adaptation Reporting Power is used effectively to present updated risks and adaptation actions that allows for an assessment of preparedness of all infrastructure sectors and their interdependencies.

3.4 Understanding and addressing infrastructure interdependencies and cascading risks is paramount to the critical functioning of the country. The 2017 public summary of sector security and resilience plans²¹ outlined the UK's approach to securing the UK's most essential public and private sector services against wide-ranging threats and hazards. This includes building resilience within the UK's 13 critical sectors²². Annual Sector Security and Resilience Plans (SSRPs) are produced by lead government departments for each of these sectors, assessing risks, resilience and setting out activities planned to mitigate and respond to risks. Government's approach to security and resilience focuses on resistance, reliability, redundancy, response and recovery. Specific information concerning the vulnerabilities of critical infrastructure is a matter of national security, and is strictly confidential.

3.5 The National Infrastructure Commission (NIC) have been commissioned to produce a resilience study, due to be published in spring 2020. Following consultation a scoping report has been produced, with a key outcome of the study expected to be a framework to consider resilience across economic infrastructure, including how to identify and address infrastructure interdependencies at a national level²³.

3.6 Infrastructure providers and utility companies are key stakeholders in adaptation reporting. The government's Adaptation Reporting Power (ARP) plays a key role in helping reporting organisations understand and take action to address climate related risks.

3.7 The third round of adaptation reporting, as set out in the third Adaptation Reporting Strategy, published alongside the NAP in

2018, builds on the previous two, to help infrastructure providers, utility companies and other reporting bodies to assess, prioritise and take action on climate change risks. The sectoral approach taken in the third reporting round is supporting reporting organisations to consider and address interacting risks and interdependencies. Government is actively engaging with sectoral ARP groups to promote dialogue on these issues.

3.8 Further to ARP, many reporting organisations participate in the Infrastructure Operators Adaptation Forum (IOAF). This is an important forum for discussion across infrastructure sectors on climate change risk planning and management. Through this forum and the ARP, we are promoting use of the updated UK climate change projections (UKCP18). These are a key tool to help organisations understand and make decisions on future climate risks.

Local Resilience Forums

3.9 Government supports data sharing among its infrastructure operators to ensure risks, including through interdependencies between infrastructure networks, are understood and managed effectively to minimise disruption to users.

3.10 Across government, action is being undertaken in a range of sectors to understand vulnerabilities, strengthen resilience and plan for emergencies. Government works extensively with local authorities, who play a pivotal role in ensuring that the areas they are responsible for are secure and resilient to risks posed by extreme weather events. Local Resilience Forums (LRFs) are a key part of the framework established by the Civil

²¹ Public Summary of Sector Security and Resilience Plans, 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/678927/Public_Summary_of_Sector_Security_and_Resilience_Plans_2017_FINAL_pdf_002.pdf

²² Chemicals, Civil Nuclear, Communications, Defence, Emergency Services, Energy, Finance, Food, Government, Health, Space, Transport and Water.

²³ National Infrastructure Commission – Resilience Study Scoping Report, 2019 https://www.nic.org.uk/wp-content/uploads/NIC_Resilience_Scoping_Report_September_2019-Final.pdf

Contingencies Act 2004 to ensure collaborative delivery of emergency preparedness locally.

3.11 The Infrastructure and Projects Authority (IPA) has promoted data sharing to bridge the efforts of infrastructure providers and local authorities. The IPA are creating a sector-led forum consisting of water companies and local authorities to define and develop a standardised methodology for benchmarking embankments.

Transport

3.12 Government works with industry partners to manage multiple risks to the transport sector including those caused by extreme weather. A well-established risk assessment process covers all risks to transport, including natural hazards and extreme weather. The process is based on reasonable weather-related scenarios assessing multiple risks and allows us to work with our stakeholders to assess the likelihood and impacts from these risks across the transport sector. Work is being scoped to incorporate UKCP18 projections into this risk assessment.

3.13 Over £6.6 billion has been made available to local highway authorities (outside London) for local highway maintenance for the period between 2015 and 2021. Planning for the impacts of climate change is a vital part of this.

3.14 Many local authorities collaborate closely with highway alliances sharing information and best practice on climate change adaptation, with reports regularly published. The government is engaging the Local Government Technical Advisors Group and external academics to look at how we can bolster local resilience and recovery in local highways. Findings will be published in due course and will include how we can improve competency and training for local

government personnel at all levels to ensure climate resilience is embedded in local highway authorities' day to day business.

Water

3.15 Under the Water Industry Act 1991 and the Security and Emergency Measures Direction 1998 (SEMD), water companies are obliged to provide sufficient wholesome water to customers and maintain plans to ensure the provision of essential water supply at all times. This includes preparing for supply disruptions caused by malicious threats and/or natural hazards.

3.16 Water companies are also required to work with key LRF stakeholders including the Environment Agency, local authorities, health authorities and the police to develop these plans. Government maintains assurance of SEMD compliance by water companies through annual external certifications. In incidents where water companies are involved, government keeps close contact with them to ensure they are engaging appropriately with the LRF and other key stakeholders.

3.17 Government made clear in the 2019 Price Review (PR19- looking at investment between 2020 and 2025) that Ofwat, the water regulator, should challenge water companies to ensure they assess the resilience of their system and infrastructure against all potential hazards and take proportionate steps to improve resilience²⁴. This includes consideration of the impact of other infrastructure failures. Government continue to work with Ofwat throughout the PR19 process to ensure water companies have properly considered this objective in their business plans.

Telecommunications

3.18 There is a significant amount of activity across the telecoms sector to strengthen

²⁴ The government's strategic priorities and objectives for Ofwat, 2017 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/661803/sps-ofwat-2017.pdf

resilience, including beyond what is captured in the CCC's assessment. The industry-run Electronic Communications Resilience and Response Group (EC-RRG) considers risks to the telecoms sector, leads on resilience activity in the sector and also owns and manages the national emergency plan. Telecoms operators have risk management strategies in place which take account of a wide range of risks, including weather and climate change related risks, which are likely to impact on their operations. These strategies are updated regularly.

3.19 The ongoing and rapid evolution of telecoms technology and short infrastructure lives means that strategies tend to focus on the short to medium term. However work is in process to understand the impacts of climate change and to put plans in place to adapt where appropriate. Investment in new flood protection measures and trained personnel is substantial, and in February, government hosted an industry workshop in partnership with the Environment Agency (EA) to discuss surface water flooding and mapping.

Gas and Electricity

3.20 The gas and electricity sectors have undertaken a significant amount of work to identify assets potentially at risk from flooding and extreme weather. The electricity sector has a particularly strong understanding of flooding risks and a well-developed approach to strengthen resilience. Electricity network companies spent £130 million on flood defence work from 2010-15, with a further £100 million due to be spent on flood defence by networks before 2021. Work is based around revised design guidelines (ETR138), which state that primary substations with over 10,000 connections should be defended against 1/1000-year flood events.

3.21 These works are coordinated with the EA and in some cases are incorporated into wider EA flood defence schemes including alternative flood defence options using natural solutions i.e. increasing stream size, catchment management plans, and similar approaches.

Chapter 4: People and the Built Environment

4.1 In the People and the Built Environment chapter of the second National Adaptation Programme (NAP), government set out a broad ambition structured around four resilient elements: population, health systems, buildings and emergency services. The chapter is underpinned by a long-term vision for the development of a healthy, equitable and resilient population, well placed to reduce the harmful health impacts of climate change, and able to capitalise on the potential health gains associated with tackling it. This includes developing a health and social care system which is resilient and adapting to a changing climate.

4.2 The People and Built Environment theme covers a diverse range of areas crucial to the functioning of everyday life and to community wellbeing. The CCC's recommendations focus on water availability, flooding, surface water, sustainable drainage systems and temperature and health. Responses to recommendations have been grouped and ordered according to these sub-themes, to aid understanding and flow.

RECOMMENDATION: Ensuring water availability and reducing usage

Recommendation 5: for action by 2021 (Owner: Defra with EA)

Additional action and coordination are required to ensure water continues to be available to people, industry, agriculture and the environment. Targets should be set and options developed to achieve greater progress in reducing water use by households and businesses and reducing the amount of water lost to leakage. Greater assurance about the level of resilience being planned for and how trade-offs with other outcomes, like keeping customer bills low, needs to be considered.

4.3 Continuance of water supply is essential for all sectors. Government has a range of plans to ensure clean and plentiful water continues to be available to people, industry, agriculture and the environment; a key part of our 25 Year Environment Plan. Government's 'twin-track' approach includes reducing leakage whilst reducing water demand to ensure a resilient water supply now and in the future.

4.4 Government welcomes the CCC's high scoring of water demand in the built environment, and is working with industry to improve plans to reduce water use by business through abstraction reform and targets. There is a real opportunity for the retail market to create incentives for business efficiency.

4.5 In 2017, government published its Abstraction Plan, which sets out a collaborative approach to improve access to water and protect the environment. The Environment Agency, who are leading implementation and reviewing licences, are already working in four priority catchments to trial a catchment based approach, with another six recently agreed in the pipeline. In May 2019, Government laid a report in Parliament²⁵ detailing progress made on abstraction reform since 2014, showing the Environment Agency as on track to meet water abstraction plan targets.

4.6 The Environment Agency is developing a national framework that will use evidence to illustrate the regional and national challenge of water availability. It will set government expectations of regional groups before they prepare their regional plans. It will also identify the scale and likely growth in demand for water from a range of sectors.

4.7 Government's Strategic Policy Statement in 2017 asked Ofwat to challenge water companies to go further on customer affordability and long term resilience. Ofwat will shortly complete the current price review process (PR19). Through this, Ofwat will challenge water companies on customer bills, efficiency and resilience outcomes.

4.8 Responsibility is not just organisational. In July 2019, government launched a consultation on reducing personal water consumption to help set ambitious and appropriate targets, and understand the measures needed to achieve them. Government also endorses the water industry's commitment to halve leakage by 2050. Government will review progress on this target every five years, in line with the regulatory process.

4.9 To reduce business water use, Ofwat and government are closely monitoring the effects of the retail market, including impacts on water efficiency. Ofwat are working with

Market Operator Services Limited to remove barriers to water efficiency and to unlock market potential.

4.10 Government is reviewing its own estate's water consumption, developing updated targets. The new Greening Government Commitments (GGCs) for 2020-2025 offer a great opportunity to review current GGCs and consider how they might better reflect Government's current policy priorities. Discussions have begun across government to review targets and will continue to do so over the coming months.

RECOMMENDATION: Transitioning to the withdrawal of Flood Re

Recommendation 6: for action by 2023 (Owner: Defra)

Near-term milestones are required for transitioning to the withdrawal of Flood Re in 2039, including joint strategies and targets to accelerate the implementation of property-level flood resilience measures in England.

4.11 Flood Re has a duty to ensure that by 2039 the UK has transitioned to a risk reflective flood insurance market. Flood Re published their second Transition Plan in July 2018, setting out 12 areas where it believes change is needed. These include: limiting flood risks; reducing flooding costs; promoting a competitive insurance market; and understanding the limits of affordability.

4.12 In July 2019, Flood Re published their Quinquennial Review and made recommendations to government on how to make the Flood Re scheme more efficient and how to progress the transition to risk-reflective pricing. This included proposals designed to give Flood Re greater powers to encourage the uptake of flood resilience and resistance

²⁵ Abstraction Reform Report 2019 <https://www.gov.uk/government/publications/abstraction-reform-report-2019>

in homes. Government is carefully considering its recommendations.

4.13 Government is acting to address challenges to Property Flood Resilience (PFR), and promote householder behavioural change in householders, industry and the commercial sector. Since 2009, Defra and the Environment Agency have funded installation of a range of PFR measures in around 20,000 properties. 11,000 homes (about 60% of those eligible) took up the offer of a PFR recovery grant following the 2015/16 floods in Northern England. There will be further PFR schemes delivered up to 2021 and beyond, as part of the Flood Defence Grant in Aid programme.

4.14 In July 2019, government announced that £2.9 million extra funding will be used to support three regional pathfinder projects that will boost research into, and uptake of, property-level measures which can better protect homes and businesses from flooding.

4.15 Defra's business-led PFR Roundtable has been developing implementation pathways to improve PFR delivery through the commercial and construction sectors. They expect to publish a Code of Practice for PFR in early 2020, which sets out standards on supply and installation of PFR and should improve consumer experience. The British Standards Institute published a new "British Standard" of flood resistant products (BS851188) on 24 September and launched formally on 1 October. Government's flood research programmes continue to explore communication and understanding of flood risk.

RECOMMENDATION: Progress on the draft Flood and Coastal Erosion Risk Management strategy

Recommendation 7: for action by 2020 (Owner: Defra)

The Environment Agency's draft Flood and Coastal Erosion Risk Management (FCERM) strategy is a significant improvement over previous versions in that it sets long-term objectives to improve resilience to flooding and coastal change and is aligned with the adaptation gaps identified in CCRA2. Defra should approve the strategy and align its upcoming FCERM Policy Statement with the strategy.

4.16 By the end of 2019, the government will set out its policies to better prepare the country for flooding and coastal erosion in a government policy statement on flooding and coastal erosion, and in the national infrastructure strategy. Informed by this government policy, the Environment Agency will update its draft national strategy for FCERM, which will help to inform future policy decisions.

4.17 Taken together, these documents will ensure the country is on the right footing to better manage and adapt to the risks of flooding and coastal erosion – which are increasing as a result of climate change and population growth. Improving our resilience to these risks will have benefits for our economy, environment, communities and wellbeing.

4.18 Government is already investing £2.6 billion to better protect 300,000 homes by 2021. In September 2019 government announced over £60 million of additional funding to support capital projects and better protect communities which are vulnerable to flooding, particularly across parts of northern England.

RECOMMENDATION: Planning for and addressing surface water flooding

Recommendation 1: for action by 2021 (Owner: MHCLG and Defra)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] development in areas of surface water flooding [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

4.19 Government recognises the importance of managing development in areas of surface water flooding risks. In July 2018, government published a Surface Water Management Action Plan (SWMAP), setting out steps to tackle the associated risks (completing a commitment set out in the NAP). The 2018 Budget allocated £4.7 million over two years to improve management of the surface water flood risk, bringing surface water flood risk assessment more closely into line with what we have for rivers and the sea, and boosting implementation of the Surface Water Management Action Plan (SWMAP).

4.20 Government welcomes the CCC's recognition that improving understanding and capacity are integral to adaptation. Enhancing understanding of data issues and other barriers to managing surface water risks effectively is an essential step in determining future priorities and potential actions. Government agrees that there is room for better understanding of surface water roles and responsibilities and for improving partnership working between key parties. The SWMAP includes a commitment to clarify the roles of Risk Management Authorities, and other key players.

4.21 Government does not agree that climate change is missing from surface water plans. Local Flood Risk Management Strategies are

the most important plan for strategic planning and management of local flood risks, including surface water risks. The Environment Agency has produced tools to help Lead Local Flood Authorities (LLFAs) consider the impacts of climate change on sources of local flood risk to inform local flood risk management strategies. The National Planning Policy Framework (NPPF) is clear that new development plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk. All new private drainage systems proposed as part of new surface water drainage systems development must comply with the Environment Agency's climate change allowances for rainfall intensity (20% and 40% increases in intensity by 2115). The Environment Agency are going to review the peak rainfall allowances following publication of UKCP18 local (2.2km) data²⁶.

4.22 The Environment Agency undertake many activities to support this, including publishing surface water maps which show the risk flood risk. These maps are planned to be upgraded significantly.

4.23 Investment in retrofitting sustainable drainage systems (SuDS) by water and sewerage companies, local authorities and others will mitigate the impacts of future climate change and is expected to result in a net benefit for surface water flood risk. Further detail on SuDS is contained in response to the next recommendation. The SWMAP committed to review funding available for surface water risk management. We will continue to work with the Environment Agency and HM Treasury to consider future investment needs and government's role in supporting the resilience of communities.

²⁶ <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/high-res-projections>

RECOMMENDATION: Maximising the impact of Sustainable Drainage Systems (SuDS)

Recommendation 8: for action by 2021 (Owner: MHCLG)

The National Planning Policy Framework (NPPF) and planning practice guidance (PPG) should be updated to ensure that Sustainable Drainage Systems (SuDS) installations maximise their impact in terms of flood risk reduction and their co-benefits. This could be done by aligning the NPPF and PPG with the aims of Schedule 3 of the Flood and Water Management Act (2010).

4.24 Government recognises the importance of encouraging natural flood management approaches, such as green sustainable drainage systems (SuDS), to ensure flood risk is managed effectively locally and nationally.

4.25 The revised NPPF published in July 2018 (and updated in February 2019) sets out that SuDS should be given priority in new developments in flood risk areas. The revised framework incorporates strengthened policy that was introduced in April 2015 to make clear the expectation that SuDS are to be provided in all new major developments, unless demonstrated to be inappropriate. When determining planning applications, local planning authorities should conserve and enhance biodiversity, and adopt strategies to mitigate and adapt to climate change.

4.26 Government's review of the application and effectiveness of planning policy for SuDS, published in August 2018, found that almost 90% of the sampled approved planning applications explicitly stated that SuDS would feature in the proposed development. Development plans are expected to use opportunities provided by new development to reduce flooding causes and impacts through natural flood management techniques where appropriate. Lead Local Flood Authorities

(LLFAs) must be consulted on surface water drainage considerations in applications for all major new developments. Assessment on the effectiveness of the strengthened NPPF will need robust up-to-date evidence, allowing sufficient time for the policy to be fully implemented and embedded through the planning process.

4.27 Government will shortly publish the revised Planning Practice Guidance clarifying how SuDS can be part of a comprehensive drainage approach that can present opportunities for net reductions in the causes and impacts of flooding and deliver additional benefits, such as using SuDS for delivery of biodiversity/ environmental net gain.

4.28 Water and sewerage companies (via WaterUK) are developing adoption standards for SuDS, currently expected to be introduced in April 2020. The pre-implementation version of these standards has been published and it will enable Water and Sewerage Companies to adopt and use SuDS, as well as providing clarity and certainty for developers on design principles.

RECOMMENDATION: Planning for and addressing health impacts from heat and cold

Recommendation 1: for action by 2021 (Owner: DHSC and PHE)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] health impacts from heat and cold [...]. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

4.29 Planning for and addressing key climate risks to health, such as heat and cold, is crucial. Government is taking forward initiatives to address these risks, including by Public Health England, who are sponsored

by the Department of Health and Social Care (DHSC) to carry out some of the functions in this report on behalf of the department.

4.30 All National Health Service (NHS) providers are required through the standard contract to have a Sustainable Development Management Plan in place, and updated guidance now includes a section relating to adaptation planning. NHS England and NHS Improvement are encouraging providers to consider adaptation alongside their sustainability commitments in the NHS Long Term Plan.

Cold

4.31 Cold related deaths dominate the burden of ill health related to adverse weather in England, and this will continue despite a warming climate²⁷. The forthcoming adverse weather and health plan, which will be developed by 2022, will continue to focus efforts on reducing the burden of mortality and morbidity from cold.

4.32 Public Health England (PHE) has worked closely with BEIS in developing the new Fuel Poverty Strategy (out for consultation until September 2019)²⁸. This focuses on the needs of the most vulnerable and improving the energy efficiency of as many fuel poor households as possible.

4.33 Each year as part of a process of assurance of NHS organisation's compliance against the Emergency Preparedness, Resilience and Response (EPRR) core standards, NHS England undertake a "deep dive". The 2019/20 survey will focus on the effects of adverse weather (including heatwaves, cold and flooding).

Heat

4.34 PHE provided public health input to the development of the primary guidance on energy efficiency in healthcare facilities in England²⁹, both new and existing. This includes recommendations for climate resilient building design, such as to increasing temperatures, and provides thermal comfort and temperatures advice for ensuring patient and staff wellbeing in clinical and non-clinical areas within hospitals.

4.35 An independent evaluation of the Heatwave plan for England, commissioned by DHSC, has been undertaken, including a survey of the public and nursing staff. The findings will provide useful intelligence to support sector engagement on planning to reduce risks to patients and the public, and to support health service delivery in heatwave.

Research

4.36 PHE is currently updating its five-year research strategy on climate change and health. This will consider a wide range of risks and opportunities of climate change impacts on health as identified by the second CCRA. Updated estimates of direct and indirect climate-related health impacts using the recently published UKCP18 climate projections will be included. Findings will be published in a comprehensive report: "Health Effects of Climate Change in the UK" (due 2023).

²⁷ As detailed in the second National Adaptation Programme <https://www.gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme>

²⁸ Fuel Poverty Strategy for England <https://www.gov.uk/government/consultations/fuel-poverty-strategy-for-england>

²⁹ 'Health Technical Memorandum 07-02: EnCO2de 2015 – making energy work in healthcare' DH (2015) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416635/HTM_07-02_Part_A_FINAL.pdf

RECOMMENDATION HEADING: Planning for and addressing overheating in care homes and care facilities

Recommendation 10: for action by 2021 (Owner: DHSC with CQC)

A plan is needed to address the risks of overheating in care homes and care facilities, including consideration of home-based care.

4.37 Severe heat is harmful to everyone, especially vulnerable groups such as older and disabled people. Government's health bodies are making sure their dedicated social care staff have the guidance and advice they need to respond to severe heat. The Heatwave Plan for England helps local authorities prepare for heatwaves and during such events social workers, community wardens and maintenance staff on the ground will be looking out for those who might be struggling in the heat and making calls and extra visits to vulnerable people³⁰.

4.38 Recently the NHS Sustainable Development Unit (SDU) has undertaken a survey of primary and social care providers, residential and home care to identify the types of risks, impacts and mitigation options. Findings from this survey will help inform the health and care sector voluntary report, invited under the government's Adaptation Reporting Power. Third round adaptation reports are due by 2021.

4.39 The Care Providers Alliance brings together the main national associations that represent independent and voluntary adult social care providers in England. In 2018 it published contingency planning guidance to help providers in social care with contingency planning in a variety of scenarios, including severe heatwaves³¹.

4.40 As part of their inspections, the Care Quality Commission (CQC) consider whether care providers ensure a safe environment for residents, including temperature, and that they meet people's nutrition and hydration needs.

4.41 PHE, with academic partners, are undertaking a qualitative study to assess the impact of hot weather and overheating in healthcare estates. PHE also sit on the Project Advisory Board of the NERC-funded ClimaCare project, a research initiative addressing the challenge of adapting UK care settings to climate change. The project seeks to develop better understanding of the factors that contribute to summertime overheating in care homes and the subsequent negative health impacts.

RECOMMENDATION: Planning for and addressing overheating risk in existing and new homes

Recommendation 9: for action as soon as possible (Owner: MHCLG)

The Government still needs to publish an integrated plan to reduce overheating risk in existing and new homes, alongside decarbonising domestic heating, and planning for at least a 2°C increase in global temperature, with consideration of 4°C.

Building Regulations and Overheating

4.42 In the response to the Environmental Audit Committee's enquiry into heatwaves (September 2018) government set out an intention to consult on a method for reducing overheating risk in new homes. This is planned for consultation in the coming months.

4.43 In the Clean Growth Strategy, government committed to reviewing the Part L standards of the Building Regulations, including improving

³⁰ Government Heatwave Plan for England including 'Advice for health and social care professionals: supporting vulnerable people before and during a heatwave' and 'Advice for care home managers and staff: supporting vulnerable people before and during a heatwave': <https://www.gov.uk/government/publications/heatwave-plan-for-england>

³¹ CPA guidance to support contingency planning <https://www.careprovideralliance.org.uk/contingency-planning.html>

energy efficiency requirements in new homes where the evidence suggests it is cost effective, affordable, practical and safe to do so. Alongside this review of Part L government is also reviewing Part F of the Building Regulations, which sets minimum ventilation standards for buildings. Government launched on 1 October a consultation on the Future Homes Standard, including Part L and Part F, for new domestic buildings³². As referenced above, there is a further consultation planned on overheating in new homes in the coming months. Reviewing these standards and the new method for reducing overheating risk in an integrated way will ensure the interdependencies between energy efficiency, ventilation and overheating will be managed.

4.44 For existing homes, local authorities have powers under the Housing Act 2004 to inspect any residential property and require landlords/owners to make improvements or remove hazards, including excess heat, where necessary. The Housing Health and Safety Rating System (HHSRS) is a standard methodology used to identify potential hazards and assess the potential for harm that may result from exposure to the hazard.

4.45 In October 2018 Government launched a scoping review, which is now complete, to consider whether the HHSRS should be updated and, if so, to what extent. Earlier this year, the then Minister for

Housing and Homelessness announced a comprehensive overhaul of the HHSRS would be undertaken. This is intended to make it simpler and quicker for local authorities to assess health and safety standards in rented homes, helping them to improve conditions for tenants and better tackle rogue landlords.

Research into overheating

4.46 Government is undertaking research to understand the prevalence and magnitude of overheating in existing homes in England. This includes:

- The annual English Housing Survey (EHS), in which occupants are asked for their subjective view of overheating.
- The current Energy Follow-Up Survey (EFUS) to EHS research, in which temperature data has been collected in homes in half-hourly intervals over an 18 month period from autumn 2017 to spring 2019. Reports are expected to be published in summer 2020.
- PHE has undertaken a systematic literature review on indoor overheating thresholds, which has been accepted for publication. PHE has also joint-funded a PhD project which will investigate the relationship between ventilation and air quality, noise and overheating risk to health in new homes.

³² The Future Homes Standard: changes to Part L and Part F of the Building Regulations for new dwellings <https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings>

Chapter 5: Business

5.1 Private sector commitment in considering and responding to climate change impacts is growing significantly. The decision of the four financial regulators to report under the third cycle of Adaptation Reporting Power (ARP) is testament to this.

5.2 On 2 July 2019, government published its Green Finance Strategy (GFS) with the objective to align private sector financial flows with clean, environmentally sustainable and resilient growth, and strengthen the competitiveness of the UK financial sector. The strategy outlines how we will drive the greening of the global financial system; help mobilise private sector finance to meet our environmental objectives; and support industry in capturing the domestic and international opportunities arising from climate change.

5.3 Government is also supporting industry by working with the British Standards Institute (BSI) to develop a rigorous and consistent approach to adaptation decision making. Through BSI and the International Organisation for Standardisation (ISO) we are exploring the role of standards in climate change adaptation. Standardisation offers organisations and businesses improved confidence and transparency in order to leverage investment in adaptation activities. The first international adaptation standard, ISO 14090: Adaptation to climate change – Principles, requirements and guidelines³³, was published earlier this

year with further standards in the process of being developed.

5.4 The second CCRA outlines key climate change risks to business and industry, including damage to assets and disruption to business operations from extreme weather such as flooding, and international risks to food production, trade and supply chains. As set out in the second NAP, our vision is for businesses to be resilient to extreme weather and prepared for future risks and opportunities from climate change.

RECOMMENDATION: Risks to the UK from climate change impacts overseas (food production, supply chains and trade)

Recommendation 3: for action by 2021

Adaptation plans are needed to address the scale of climate risk that the UK faces from climate change impacts overseas. Cross-government working is required to develop and implement these plans.

5.5 Government recognises the importance of considering and addressing climate change risks to food supply chains, production and trade. The UK Food Security Assessment is a comprehensive analysis of all aspects of food security. It covers six themes: Global Food Security; Global Resource Sustainability; UK Availability and Access; UK Supply Chain Resilience; Household Food Security;

³³ BS EN ISO 14090:2019, Adaptation to climate change. Principles, requirements and guidelines <https://shop.bsigroup.com/ProductDetail?pid=000000000030351696>

Consumer Safety and Confidence. The assessment looks in depth at key indicators, which are subject to change in the short term. Statistical data is updated publicly, usually on an annual basis. Government is now working towards providing a light-touch update against the headline indicators by the end of 2019.

5.6 Government has also commissioned Defra's Non-Executive Director to lead an independent review to develop recommendations to help shape a national food strategy. This will help ensure that our food system delivers healthy and affordable food and is built on a resilient and sustainable agriculture sector. The review, which will look across the issues of food security, climate change and health, was launched in June 2019, including a Call for Evidence, open until October. It will publish its final report in summer 2020. Government has committed to publishing a White Paper within 6 months of the review being published.

5.7 Internationally, the UK is establishing itself as a leader on supply chain sustainability through the Global Resource Initiative (GRI)³⁴. GRI seeks to ensure that the UK's global commodity supply chain footprint on natural resources and ecosystems is sustainable; avoids deforestation and other environmental degradation; and supports jobs, livelihoods and investment in resilient, sustainable food systems. It will identify opportunities to galvanise wider international impact on nature and climate change.

5.8 Through international trade, we have long promoted our values globally, including ambitious action on climate change. This will continue, as we explore all options in the design of future trade policy, including how best to tackle climate change. Through the UK's independent trade policy, export promotion and investment activities we will support initiatives that promote our leadership

on climate change, and seek to incorporate action supporting climate change into free trade agreements.

RECOMMENDATION: Planning for and addressing climate risk and opportunity to business

Recommendation 1: for action by 2021 (Owner: BEIS)

Little progress is being made in planning for and addressing climate change risk in key areas. These areas include [...] risks and opportunities to businesses. Effective plans, actions and evidence of risk reduction for adaptation are needed over the rest of this NAP period and beyond.

Recommendation 12: for action by 2021 (Owner: BEIS with UKRI)

Further research is needed to understand the size of climate-related business opportunities. BEIS should also set clear deadlines for ensuring listed companies and large asset owners report on climate-related risks and opportunities, as recommended by the Green Finance Taskforce and Environmental Audit Committee. This should include committing to new legislation if reviews find that the quality of reporting does not improve. Both transition and physical risks need to be addressed, supported by appropriate climate scenarios and data.

5.9 The 2018 UK climate projections, UKCP18, are already helping to inform businesses of future climate risks and strengthen business preparedness to climate change risks. Through Met Office business contacts under ARP, government are supporting businesses to interpret UKCP18, and consider how to integrate climate informed measures into planning and operations. At the 2019 European Climate Change Adaptation

³⁴ Global Resource Initiative Taskforce <https://www.gov.uk/government/publications/global-resource-initiative-taskforce>

(ECCA) conference, the Environment Agency, together with private sector partners, delivered a workshop on lessons learned on corporate reporting for physical risks.

5.10 On 1 October the Environment Agency introduced changes to the Environmental Permitting Regulations (EPR) to require organisations to consider potential climate risks as part of the permit application, alongside other types of environmental risk. New bespoke installations and waste permit applications will be first to have climate change risk explicitly considered. The new process is intended to help operators understand how changes in climate and weather may affect their operations and infrastructure in future – and how they may mitigate against potential impacts to avoid incidents which will cause environmental harm³⁵.

5.11 The climate change resilience market is a rapidly growing one, and is an area with significant UK expertise and capability. In June the International Trade Secretary announced government support for the export of climate resilient infrastructure³⁶. Under this agreement, UK Export Finance and the Environment Agency will work together, and with a private sector partner AECOM, to help UK suppliers with expertise in climate change adaptation to deliver infrastructure projects and services across the globe. As part of the Department for International Trade's green initiative, the partnership demonstrates the growing potential business opportunities of climate adaptation as well as the expertise of UK suppliers in the sector.

5.12 Government supports the CCC's recommendation calling for further research on risks and opportunities to business and industry. Work is ongoing to develop a stronger evidence base through the newly announced

Green Finance Institute, and through the UK Climate Resilience programme, under the £18.7 million UK Research & Innovation (UKRI) and Met Office Strategic Priorities Fund (SPF). This aims to draw together climate research and expertise to deliver robust, multi and inter-disciplinary climate risk and adaptation solutions research. This will ensure the UK is resilient and powerfully positioned to exploit the opportunities of adaptation and green growth.

5.13 The Green Finance Strategy outlines measures to ensure risks and opportunities from climate and environmental factors are integrated into mainstream financial decision making. This includes the expectation for all listed companies and large asset owners to disclose by 2022 their exposure to climate change, in line with recommendations from the Task Force on Climate-related Financial Disclosures (TCFD). Government agrees that it should set clear deadlines for such disclosures, and explore further actions depending on the quality of reporting. Government has also established a joint taskforce with UK regulators, to examine the most effective way to approach climate-related financial disclosures, including exploring mandatory reporting.

5.14 Government will continue to explore actions we can take to advance progress on the greening of the UK financial system and will publish an interim report by the end of 2020, including progress on TCFD implementation. Government will also conduct a formal review of progress against the ambitions and plans set out in the Green Finance Strategy in 2022.

³⁵ Adapting to climate change: risk assessment for your environmental permit <https://www.gov.uk/guidance/adapting-to-climate-change-risk-assessment-for-your-environmental-permit>

³⁶ International Trade Secretary announces export support for UK's climate resilience sector: <https://www.gov.uk/government/news/liam-fox-announces-export-support-for-uks-climate-resilience-sector>

Glossary

Acronym	Definition
25 YEP	25 Year Environment Plan
ALBs	Arm's Length Bodies
ARP	Adaptation Reporting Power
ASC	Adaptation Sub-Committee of the Committee on Climate Change
CBD	Convention on Biological Diversity
CCA	Climate Change Act 2008
CCC	Committee on Climate Change
COP	Conference of the Parties i.e., under the United Nations Framework Convention on Climate Change (UNFCCC).
CQC	Care Quality Commission
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CGS	Clean Growth Strategy
CCRA	Climate Change Risk Assessment
DAs	Devolved Administrations (DAs)
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EC-RRG	Electronic Communications Resilience and Response Group
ELM	Environmental Land Management
EU	European Union
FAS	Farming Advisory Service
HMG	Her Majesty's Government
IOAF	Infrastructure Operators Adaptation Form
IPA	Infrastructure and Projects Authority
LAs	Local Authorities
LAAP	Local Adaptation Advisory Panel
LGTAG	Local Government Technical Advisors Group
LLFA	Lead Local Flood Authorities
LRFs	Local Resilience Forums
MPAs	Marine Protected Areas

Acronym	Definition
MSY	Maximum Sustainable Yield
NAP	National Adaptation Programme
NE	Natural England
NERC	Natural Environment Research Council
NFRR	National Flood Resilience Review
NHS	National Health Service
NIC	National Infrastructure Commission
NPPF	National Planning Policy Framework
NRN	Nature Recovery Network
OEP	Office for Environmental Protection
Ofwat	Water Services Regulation Authority
PAs	Protected Areas
R&D	Research and Development
SEAFISH	Sea Fish Industry Authority
SEMD	Security and Emergency Measures Direction 1998
SSRP	Sector Security and Resilience Plan
SuDS	Sustainable Drainage Systems
SWMAP	Surface Water Management Action Plan
TFP	Transforming Food Production Initiative
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UNCAS	United Nations Climate Action Summit
UKRI	UK Research and Innovation

