



House of Commons
Environmental Audit Committee

**Heatwaves: adapting
to climate change:
Government Response
to the Committee's
Ninth Report**

**Tenth Special Report of Session
2017–19**

*Ordered by the House of Commons
to be printed 23 October 2018*

Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

Current membership

[Mary Creagh MP](#) (*Labour, Wakefield*) (Chair)

[Colin Clark MP](#) (*Conservative, Gordon*)

[Dr Thérèse Coffey MP](#) (*Conservative, Suffolk Coastal*)

[Geraint Davies MP](#) (*Labour (Co-op), Swansea West*)

[Mr Philip Dunne MP](#) (*Conservative, Ludlow*)

[Zac Goldsmith MP](#) (*Conservative, Richmond Park*)

[Mr Robert Goodwill MP](#) (*Conservative, Scarborough and Whitby*)

[James Gray MP](#) (*Conservative, North Wiltshire*)

[Caroline Lucas MP](#) (*Green Party, Brighton, Pavilion*)

[Kerry McCarthy MP](#) (*Labour, Bristol East*)

[Anna McMorrin MP](#) (*Labour, Cardiff North*)

[John McNally MP](#) (*Scottish National Party, Falkirk*)

[Dr Matthew Offord MP](#) (*Conservative, Hendon*)

[Dr Dan Poulter MP](#) (*Conservative, Central Suffolk and North Ipswich*)

[Joan Ryan MP](#) (*Labour, Enfield North*)

[Alex Sobel MP](#) (*Labour (Co-op), Leeds North West*)

Powers

The constitution and powers are set out in House of Commons Standing Orders, principally in SO No 152A. These are available on the internet via www.parliament.uk.

Publications

Committee reports are published on the Committee's website at www.parliament.uk/eacom and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

Committee staff

The current staff of the Committee are Lloyd Owen (Clerk), Leoni Kurt (Second Clerk), Nicholas Davies (Committee Specialist), Laura Grant (Committee Specialist), Laura Scott (Committee Specialist), Jonathan Wright (Senior Committee Assistant), Baris Tufekci (Committee Assistant), and Anne Peacock (Media Officer).

Contacts

All correspondence should be addressed to the Clerk of the Environmental Audit Committee, House of Commons, London SW1A 0AA. The telephone number for general enquiries is 020 7219 5776; the Committee's email address is eacom@parliament.uk

Tenth Special Report

The Environmental Audit Committee published its Ninth Report of Session 2017–19, *Heatwaves: adapting to climate change* (HC 826) on 26 July 2018. The Government's response was received on 25 September 2018 and is appended to this report.

Appendix: Government Response

The developing threat of heatwaves

1. The Government should launch a Minister-led public information campaign on the developing threat of heatwaves and their significant impact on human health and activities. Public Health England should update the Heatwave Plan for England with evidence of the increasing frequency of heatwaves. The Met Office should detail this risk on its website.

During periods of hot weather, the Met Office works closely with Public Health England (PHE) to provide direct public health messaging. The Met Office also host content on the health impacts of high temperatures online.¹

In addition the Met Office Hadley Centre Climate Programme (MOHCCP) delivers world- leading scientific evidence on climate variability and change, benefitting the UK climate science base as well as serving the needs of UK Government. It is supported by the Department of Business, Energy and Industrial Strategy (BEIS) and the Department for Environment, Food and Rural Affairs (Defra). One of the areas of the new 2018–2021 work plan includes identifying the current weather and climate risks, both in the UK and globally, and outlining the latest information on trends in various extremes of weather and climate on the Met Office website. This will include a specific webpage dedicated to the changing risk of heatwaves in the UK, drawing on information from attribution studies as well as the next set of UK climate projections (UKCP18), which is due for launch later this year.

UKCP18 will include projections of temperature out to the end of the century for the UK and this data will be freely available to download on a dedicated website, which will also outline key messages from the projections. UKCP18 will ensure that decision-makers will have the most up-to-date information on the future of our climate to help plan for and mitigate against the risk of heatwaves.

As a result of the extended warm and dry weather of summer 2018 in the UK, the Met Office Hadley Centre will also be carrying out a full scientific attribution study to understand to what extent the weather has been affected by human influence on the climate. This report is expected to be completed in the autumn.

As per the Heatwave Plan for England, the Department for Health and Social Care (DHSC) has commissioned an independent evaluation of the current Heatwave Plan for England, due to report in November 2018. The findings will inform the new single adverse weather and health plan and associated resources.

1 <https://www.metoffice.gov.uk/health/yourhealth/hot-weather-and-health>

2. We support the Government's plan to create a single adverse weather plan and strongly recommend that alerting systems run throughout the year, especially targeted to those who are likely to suffer before heatwave temperature thresholds are reached.

The Government accepts this recommendation. The Government considers that the clear, targeted and consistent messages that are delivered to the public during periods of hot weather are proportionate and sufficient to protect public health. PHE, on behalf of the Secretary of State for Health and Social Care and the Chief Medical Officer, provides direct public health messaging via print, broadcast and social media at local and national level. This includes the 'Beat the Heat' materials, which provide written advice for the public, including advice on how to stay cool indoors, and a heatwave communications toolkit for National Health Service (NHS) trusts and Local Authorities. Public Health England have effectively disseminated such public health messaging across a range of channels, advising the public of risks to health during the recent period of extended hot weather this summer. In order to ensure that advice meets future public health needs, Public Health England will undertake an assessment of summer health impacts to inform the new adverse weather plan and future public health response.

The Government welcomes the Committee's support for a single adverse weather and health plan which will include evidence on the frequency of heatwaves and hot weather. This will create a year-round alerting service and bring together guidance and advice about tackling the increasing risks and health impacts of heatwaves and cold weather. DHSC has commissioned an independent evaluation of the current Heatwave Plan for England, due to report in November 2018. The findings will inform the new single adverse weather and health plan and associated resources.

Responsibility for heatwave preparation

3. The Department for Health and Social Care should provide a Ministerial lead on responsibility for climate change related health risks. The Minister should work closely with DEFRA, and across government, to ensure there is a holistic and coordinated approach to adapting to the health risks of climate change, building on the advice of the Committee on Climate Change.

The Government accepts this recommendation. DHSC has a ministerial lead on climate change related health risks; currently the Parliamentary Under Secretary of State (Public Health and Primary Care). The Minister works in close collaboration with the Parliamentary Under Secretary of State for Rural Affairs and Biosecurity, who has the responsibility in Government for climate change adaptation, and with Ministers across Whitehall to ensure that health is embedded within climate and adaptation related policy, taking into account the advice of the Committee on Climate Change.

4. The Department for Environment, Food and Rural Affairs should fulfil its adaptation responsibility by monitoring the capacity of local authorities to prioritise adaptation, and require local authorities to report on how they are adapting to climate change. DEFRA should also ensure that adaptation guidance for local authorities is updated regularly. As the risks from climate change grow, funding for Regional Climate Change Partnerships should be reinstated.

The Department for Environment, Food, and Rural Affairs (Defra) supports the Local Adaptation Advisory Panel, the forum on climate change adaptation bringing together central and local government, to promote and deliver adaptation in the local government sector. Councils recognise the risks and impact of heatwaves in their areas, in particular where overheating affects buildings, and many are taking actions to minimise these risks.

Defra is responsible for the five yearly Adaptation Reporting Power (ARP) Strategy, under the 2008 Climate Change Act. The ARP helps ensure that “persons or bodies with a function of a public nature” and “statutory undertakers” are taking action to adapt to climate change by reporting on how they are addressing current and future climate impacts. Responses to the consultation on the 2018 ARP Strategy earlier this year showed overwhelming support for the principles that reporting should be proportionate, risk-based and streamlined to minimise burdens or duplications, and should build on previous rounds of reporting to improve report quality and participation. In the consultation Government also considered whether Local Authorities should report under ARP and concluded that, as they already have a number of duties and reporting obligations on a range of climate risks, reporting was not necessary. The Local Government Association are particularly clear that councils should not be included on the basis of existing commitments. These responsibilities include:

- Lead Planning Authorities being required to take account of adaptation, by virtue of the Planning and Compulsory Purchase Act 2004 (as amended). This requires that development plans must include ‘policies designed to secure that the development and use of land in the local planning authority’s area contribute to the mitigation of, and adaptation to, climate change’. This requirement is well-covered in Planning Practice Guidance on climate change. Lead Planning Authorities are required to consult on and publish their local plans;
- under the Flood and Water Management Act 2010, Lead Local Flood Authorities (county and unitary authorities) have responsibility for local flood risk management. This ensures that flooding from surface run-off, groundwater and ordinary watercourses is identified and managed as part of an agreed local flood risk management strategy. Local authorities are asked to report focussing on outcomes (e.g. what they use their local flood risk management strategy to influence/deliver, rather than whether they have one). The data is collected annually as of 31 March;
- Lead Local Flood Authorities are also required to consult on and publish local flood risk strategies. In addition, they must produce and publish flood investigation reports where they deem it necessary and appropriate, which examine the causes of flooding incidents and how future risk of that event reoccurring will be addressed as well as the role of any relevant risk management authority;
- under the Civil Contingencies Act 2004 local councils are Category one responders and must prepare and plan for emergencies in partnership with other local responders, e.g. police, fire and ambulance services, utilities and the Environment Agency. Emergencies include those linked to climate impacts such as flooding, water scarcity, and extreme heat;

- Category one responders have a statutory duty to publish their emergency plans. Most Local Resilience Forum areas maintain multi-agency plans (including multi-agency flood plans where flooding is a significant risk). Local authorities are closely involved in planning and response phases and they usually lead multi-agency work during the recovery phase following incidents;
- upper and single tier local authorities report to central government on performance on local biodiversity annually. This includes data (in part supplied by Local Nature Partnerships) on the proportion of local sites where positive conservation management is being achieved, in order to assess effectiveness of local delivery. This gives information on the link between climate change and impacts on biodiversity.

The support mechanism for Local Authorities, also known as the Climate Ready Support Service (CRSS), was designed to deliver the objectives in the first National Adaptation Programme (2013). It was envisaged as a time-limited three year programme but was extended for a further year until March 2016. The extensive range of tools that the CRSS produced with stakeholders over its existence continues to be made available to help businesses and organisations adapt. Government is considering the recommendation to update the adaptation guidance for local authorities and will evaluate the need for further action.

Government will consider the recommendation to re-instate the Regional Climate Change Partnerships alongside other options as we develop our approach to support local adaptation.

Protecting health and wellbeing

5. It is worrying that Public Health England makes recommendations it is unable to monitor and enforce. NHS England should issue guidance on planning for summer pressures, to ensure that adequate steps are taken to prepare the healthcare system for more frequent heatwaves. NHS organisations should submit annual heatwave plans to ensure they are prepared for the sudden onset of a heatwave. In their response to this report, the Government should set out how it has accounted for the risks from climate change in its recent NHS funding settlement and how this risk is being considered in the production of the new ten year NHS plan.

The Government partially accepts the recommendation. Guidance on planning to prepare the healthcare system for more frequent heatwaves is provided in the Heatwave Plan for England. It is PHE's role to provide advice on public health risks, including heatwaves and, in collaboration with DHSC, NHS England and other stakeholders, PHE publishes the Government's Heatwave Plan for England. The plan contains recommendations for health and social care staff in all settings. These recommendations are not mandatory, however it is NHS organisations' responsibility to prepare plans and take action to adapt to climate change and to report on their preparation, including for more frequent heatwaves.

NHS Trusts are required to report annually on preparation for heatwaves as part of their sustainability plans. Providers are also required to report annually on thermal monitoring and overheating events in Estates Return Information Collection (ERIC) returns that are signed off by a board level senior officer, CFO or equivalent.

In June, the Prime Minister announced an additional £20bn in real terms for the NHS by 2023/24. This is a major investment in one of the country's most cherished institutions which will support the NHS to make the right decisions for the long-term. NHS leaders are producing a new ten-year plan, led by clinicians, professionals and supported by local health and care systems across the country. The plan will set a vision for the health service and ensure every penny is well spent. As part of the development of this plan, NHS England has launched a public consultation. They are seeking feedback from individuals and organisations via their website by 30th September. The long-term plan is due to be published in autumn 2018.

6. NHS England should include overheating as part of EPRR assurance, and ensure that all hospitals and NHS operated nursing homes are compliant with it. The Department of Health and Social Care should provide guidance to the Care Quality Commission on how to inspect for overheating risk, and ensure that overheating risk forms part of its inspection for safety and suitability of health and social care premises.

The Government accepts this recommendation. Planning for heatwaves is already part of the NHS Emergency Preparedness, Resilience and Response (EPRR) core standards and NHS organisations are responsible for meeting these core standards. NHS England undertake a “deep dive” each year under a process of assurance of NHS organisations' compliance against the EPRR core standards. For the year 2019/2020 it is proposed the deep dive will consider the effects of heatwave and cold weather, which will inform the development of the new single adverse weather and health plan.

The Care Quality Commission (CQC) already considers temperature and hydration in their inspections as part of ensuring a safe environment. The CQC quality assessment framework provides for this within the ‘safety’ section and contains key lines of enquiry, supplemented by more detailed prompts. The CQC quality assessment framework is reviewed periodically and CQC will include this recommendation in the scope of the next review, with input from DHSC.

7. The Committee on Climate Change has repeatedly recommended a standard or building regulation to prevent overheating in new buildings. As the 1983 Building Regulations Act was written with the protection of people's health in mind, the Government should use this enabling power to create a regulation to stop buildings being built which are prone to overheating. If the Government do not ensure that new buildings are designed to prevent overheating, housing providers or homeowners will have to pay for costly remedial works as heatwave risk intensifies.

In response to the Committee on Climate Change's Adaptation Sub-Committee's recommendation in 2015, the Ministry of Housing, Communities and Local Government (MHCLG) undertook a piece of research into overheating in new homes. The research investigated the impacts of overheating in new homes on mortality and a loss of productivity

due to sleep disruption. It was found that all new homes exceed the overheating threshold to some extent and that this overheating can be mitigated in most circumstances using passive measures such as shading and ventilation.

This research will assist the Government in addressing the issues on overheating raised by the Committee in its forthcoming review of the energy efficiency standards in Building Regulations, as committed to in the Clean Growth Strategy.

8. The Government should make the use of a dynamic thermo-modelling test, such as the Chartered Institution of Building Services Engineer's TM59 and TM52 guidance, a regulatory requirement for new buildings. Requiring the test would enable property developers to demonstrate compliance with the new overheating regulation to protect health. The Government should explore extending the Green Deal to cover heat- resilient measures.

Alongside the Government's review into the energy efficiency standards of the Building Regulations, MHCLG will consult on a method for reducing overheating risk in new homes. A range of methods will be considered to demonstrate compliance with the new requirement. The method must be practical for house builders.

It is currently possible to add new measures to the Green Deal but in practice the process can be lengthy, involving initial assessment, consultation, modelling, inclusion in the Standard Assessment Procedure (SAP) and software changes. Broadly, to be included as a measure, a technology must currently meet one of the following criteria:

- A measure which improves efficiency of gas or electricity (or any other energy, if specified in an Order) used in a property;
- microgeneration, including energy generated from: biomass, biofuels, fuel cells, PV, tidal/wave, wind, solar, geothermal, combined heat & power;
- anything else that increases electricity generation or heat production, or reduces consumption through low-emission technology.

Looking to the future, the Government is currently reviewing the Green Deal and this could open the way to a more flexible approach to the range of measures supported, and faster inclusion of new measures. The review began with a Call for Evidence last year, which included questions on whether more flexibility could be introduced into the range of measures supported, and whether the process for adding measures could be improved. There was considerable support from respondents for more flexible and efficient approaches (the Call for Evidence and a summary of responses can be found here). The Government will consult on any changes to the Green Deal in due course.

9. The Ministry of Housing, Communities and Local Government should make specific reference to the greater risk of overheating in urban areas and require local planning authorities with responsibility for dense urban areas to demonstrate how they have mitigated this in their local development plan, including the use of a well-enforced 'cooling hierarchy' to avoid the exacerbating impact of air conditioning. The Government should work with local authorities so that local plans take long term risks such as climate change into account. The Government should stop directing financial support to modular housing from its Home Building Fund.

The revised National Planning Policy Framework clarifies important aspects of climate change policy and sets out that all local development plans should take a proactive approach to mitigating and adapting to climate change and take into account the risk of overheating from rising temperatures. Local plan policies should be in line with the objectives and provisions of the Climate Change Act 2008. The revised wording includes advice that rising temperatures and resilience to climate change should be considered in local plans. National planning guidance provides further advice and information on implementing national planning policy and which:

- advises local planning authorities on integrating climate change adaptation and mitigation approaches to support sustainable development;
- provides examples of adaptation measures.

MHCLG planning guidance also encourages several strategies to keep people cool in hot weather through:

- maximising natural ventilation in buildings which can cool them in summer;
- avoiding solar gain in buildings which leads to high indoor temperatures;
- provision of multi-functional green infrastructure, which can reduce urban heat islands and provide shade.

There is nothing inherent in modern methods of construction (MMC) that means that MMC buildings will overheat. There is no single type of MMC - rather a spectrum of different technologies used to manufacture buildings, in part or fully, offsite and assembled onsite. The final products can be thermally heavyweight or lightweight. There is currently limited evidence that thermally lightweight construction causes overheating in homes. However, as part of MHCLG's research into overheating in new homes a range of overheating mitigation methods are being investigated, including the use of thermal mass.

As Government we are technology neutral. We want to see solutions that increase productivity and quality. That is why the Housing White Paper sets out measures to stimulate the growth of Modern Methods of Construction, including offsite and innovative building techniques. Our £3 billion Home Building Fund provides loan finance to builders using MMC in addition to custom builders and new entrants to the market. The Autumn Budget added a further £1.5bn to the fund, specifically targeted at supporting small and medium-sized builders who cannot access the finance they need to build.

10. The Government should introduce an urban green infrastructure target as part of the metrics for the 25 Year Environment Plan and in the National Planning Policy Framework to ensure towns and cities are adapted to more frequent heatwaves in the future. The Government should aim to increase urban green space to 2001 levels, and higher if possible. The importance of shaded spaces in urban areas should be included in the Framework's section on 'promoting healthy and safe communities', so that all local planning authorities have to demonstrate their provision of shaded spaces in the clearance process of their local plans.

The Government's 25 Year Environment Plan, published in January, sets out our aim to improve the environment within a generation. It pays particular attention to urban

environments in Chapter 3: ‘Connecting people with the environment to improve health and wellbeing’. The Chapter highlights the range of important environmental, health and social benefits provided by green infrastructure in urban areas, and notes that as we build more homes, preserving, improving and creating green spaces in towns is more important than ever. In line with this evidence, the Government has committed to encouraging investment in green infrastructure in urban areas. As well as planting more trees in our towns and cities and clarifying planning policy for biodiversity net gain, the Government has committed to define what “good” green infrastructure is in order to create a level playing field for investors and to help focus attention on areas where provision is insufficient. Natural England is leading the establishment of a national framework of green infrastructure standards which will be published in 2019. The project is being overseen by a Whitehall steering group, led by Defra, and with representatives from MHCLG, PHE and the Department for Transport (DfT). It has established an Advisory Group with representatives from organisations with planning, green space and health expertise, including the Parks Action Group.

We agree with the Committee’s view that shaded spaces are important and we will ensure that the project considers evidence on provision of shaded spaces in urban areas. In addition, as part of the green infrastructure standards project, we will consider how indicators could help us track progress towards our 25 YEP goal of creating more green infrastructure. With regard to the recommendation to increase urban green space to 2001 levels, we do not currently have sufficient evidence to suggest that this would be the right focus.

As part of the implementation of the new framework of standards, we will support Local Authorities to assess green infrastructure provision against the framework. Once the framework has been published, Defra and the Ministry of Housing, Communities and Local Government will work together to see how our commitments on green infrastructure can be incorporated into national planning guidance and policy, including how to incorporate them in planning and design guidance for new builds and estate regeneration. This could include asking local planning authorities in areas where the need for urban cooling is significant to demonstrate their provision of shaded spaces as part of their plan preparation.

11. A water-saving culture needs to be embedded to ensure that people understand the strain heatwaves place on the water supply and to make more water is available during a heatwave. The Government should adopt 110 litres per person per day as the mandatory standard in Part G of the building regulations for all new buildings.

Part G of the Building Regulations sets a minimum water efficiency standard of ‘125 litres per person per day’ for new homes. Part G was last reviewed in 2015, which introduced a stricter optional standard which can be adopted by local authorities in areas of water stress; this optional standard is ‘110 litres per person per day’. This approach offers flexibility.

The government’s 25 Year Environment Plan commits us to reducing consumption of water by setting an ambitious personal consumption target. MHCLG will continue to work closely with Defra, who are the lead government department on matters of water supply, to monitor the evidence base on how the existing optional standard is being implemented,

and consider options for future revisions of Part G of the Building Regulations. Any future options should take into account the evidence of current and predicted future water supply shortages.

12. Before publication of the revised National Policy Planning Framework it should be updated to require SuDS in all new developments. Guidance on how to build SuDS to an adoptable standard should also be produced.

National planning policy is clear that local planning authorities should ensure that priority is given to the use of SuDS (Sustainable Drainage Systems) in all developments in areas at risk of flooding, unless demonstrated to be inappropriate. The revised Framework now incorporates strengthened policy to ensure sustainable drainage systems are provided in all major developments, unless demonstrated to be inappropriate, and includes the requirements for such Sustainable Drainage Systems. We have made clear in the planning guidance that supports the National Planning Practice Framework that the policy applies to areas at risk from all sources of flooding, including from surface water, overwhelmed sewers and drainage systems.

The guidance also sets out the kinds of sustainable drainage systems that should be considered according to a hierarchy of drainage options. Generally, the aim should be to discharge surface water run-off as high up a hierarchy of drainage options as is reasonably practicable, with discharge into the ground being most favourable. The guidance is clear that particular types of sustainable drainage systems may not be practicable in all locations so in this context requiring SuDS in all developments could potentially encourage the deployment of SuDS components in areas where their use is inappropriate. For example, infiltration SuDS (i.e. draining rainwater by building a feature that facilitates its soaking into the ground) in particular would not be appropriate in a development on contaminated land, or in a designated groundwater source protection zone. Local planning authorities also need to be satisfied that there are clear arrangements in place for on-going maintenance of a SuDS for the lifetime of the development.

Recent revisions to the National Planning Policy Framework put the onus on the applicant to provide ‘clear evidence’ that SuDS, where required by the Framework, would be inappropriate.

The revised Framework,² published on 24 July sets out that local policies to manage flood risk should consider cumulative flood risks which could result from the combined impacts of a number of new but separate developments in (or affecting) areas identified as susceptible to flooding. Local plans are now expected to use opportunities provided by new development to reduce the causes and impacts of flooding through the use of natural flood management techniques where appropriate. We have emphasised that planning applications for some minor developments and changes of use are expected to meet the flood risk policy requirements for planning applications for other developments, with the exception of the sequential and exception tests, as applicable.

This clarification recognises that in areas susceptible to flooding, even small alterations can affect flood risk within or beyond the site, and changes of use can result in occupation or use by parties who are more vulnerable to harm from flooding than the previous occupants

2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf

/ users. Furthermore, existing properties may not previously have been subject to proper flood risk assessment and appropriate mitigation measures, or the nature or severity of the flood risk may have changed over time requiring more appropriate mitigation measures.

Section 171 of the Housing and Planning Act 2016 introduced a new obligation for the Secretary of State to carry out a review of planning legislation, government planning policy and local planning policies concerning the provision of sustainable drainage in developments. This review of how national planning policies for sustainable drainage systems are reflected in local plans and the uptake of these systems across a range of housing and commercial developments in England was taken forward by MHCLG, working closely with Defra and the Environment Agency and published on 23 July this year.

The review found that:

- just over 80% of all adopted local plans included SuDS policies that went further than national policy expectations (e.g. SuDS being required for all developments regardless of location and scale). This proportion increases to 90% when only emerging local plans are considered;
- almost 90% of approved planning applications sampled explicitly stated that SuDS would feature in the proposed development.

Productivity during heatwaves

13. The Government should coordinate a study of vulnerability to heat-health risks on transport and how this contributes to economic loss during heatwaves. The study should consider how the increased demand for mechanical cooling can be offset through recovering and utilising waste heat.

Government's 2017 Climate Change Risk Assessment (CCRA) identifies risks to health, well-being and productivity from high temperatures as a top risk area where more action is needed. The recent National Adaptation Programme (NAP) has set out action across Government on this (and the other risks identified in the CCRA) and Government is working to ensure the appropriate departments, including BEIS, MHCLG and DHSC, take forward this commitment.

The first NAP outlined the vulnerability of certain parts of the transport network and set out the Department for Transport's (DfT) embedded measures to mitigate climate risks within road and rail strategies. DfT is continuing to work with the transport sector to increase climate resilience in the planning and design of transport infrastructure. DfT will keep incorporating adaptation into its major plans and strategies, thereby ensuring that infrastructure project management and appraisals take adaptation into account and ensure sustainable economic growth. Further detail on measures DfT and its operators are taking to mitigate risks to public transport and transport infrastructure and improve its resilience are set out below.

14. Only 50% of England's strategic road network is surfaced with the most heat resilient material. During the hot weather in June 2018, roads across the UK, from Cumbria to the south were at risk of melting, and the A543 in Wales had to be closed. Highways England should ensure that resurfacing of roads in at-risk areas is a priority,

as heatwaves have become increasingly common. Very few car journeys start and end on the strategic road network, however the heat resilience of local roads is unclear, and support systems for local authorities no longer exist. Previous UK heatwaves led to very costly road repairs, the costs of which will fall on local authorities. The Department for Environment, Food and Rural Affairs should review the capacity of local authorities to undertake adaptation focused maintenance of local roads.

Strategic Road Network

DfT is working with the transport sector to increase climate resilience in the planning and design of transport infrastructure and is liaising closely with Highways England (HE) on ensuring the strategic road network planning interacts well with other transport infrastructure developments, such as airports and High Speed Rail developments. HE are embedding resilience to climate change across business activities to maintain a fit for purpose SRN and increase safety.

Highways England is responsible for the operation, maintenance and modernisation of England’s strategic road network—the 4,800 miles of motorways and major A-roads that span the country. The strategic road network is highly resilient to all forms of extreme weather, including high temperatures and heatwaves.

Climate change resilience is a key part of ensuring that Highways England meets the vision and ambitions of its Sustainable Development Strategy.³ This strategy states that:

“In order to become more resilient to future changes in climate, which may result in more frequent and severe weather events, it is important that we adapt our network and make effective investment decisions. Climate adaptation today is tomorrow’s resilience”.

The summer of 2018 has highlighted that heatwaves are a key challenge and Highways England will continue to work with DfT to address this. Highways England’s Climate Change Risk Assessment⁴ highlights a number of risks from extreme heat, including to pavements, structures and user groups. In their assessment, Highways England provide additional context on the effects of extreme heat on road surfaces and approaches for ensuring resilience, and a summary of how Highways England communicate with road users about hot weather conditions. Highways England are also a member of the UK Climate Projections 18 (UKCP18) Government User Group and are preparing to review risk assessments and associated work to align with the latest UKCP18 data when available.

Road surface material

Highways England typically uses two types of surface materials—hot rolled asphalt (HRA) and thin surfacing course systems (TSCS). Both types of surface are resilient to high temperatures and are fit for use in a changing climate. The TSCS is deployed primarily for its low noise properties. These two surface types make up nearly all of the strategic road network, with a small amount of residual concrete surfacing (RCS) remaining in limited locations. RCS is resilient to high temperature, but it is not typically a preferred choice of resurfacing. The TSCS is deployed primarily for its low noise properties. All

3 <https://www.gov.uk/government/publications/highways-england-sustainable-development-strategy>

4 <https://www.gov.uk/government/publications/climate-adaptation-reporting-second-round-highways-england>

of Highways England's roads and structures comply with the Design Manual for Roads and Bridges (DMRB), which is internationally recognised as best in class. Highways England routinely inspects and maintains its assets to ensure they are in good condition and able to operate safely now and in the future.

The DfT and Highways England consider there have been no issues with melting on the strategic road network this summer. All surfacing materials are rigorously tested to ensure they remain effective up to temperatures of 60°C before they are permitted to be laid anywhere on HE network. Highways England routinely inspects and maintains its assets to ensure they are in good condition and able to operate safely now and in the future.

Strategic Road Network–Background

Highways England recognises that climate resilience is not just about physical infrastructure. People travel and work on the strategic road network and their safety and wellbeing in extreme weather, including heatwaves is of high priority. Highways England has robust plans in place to work with civil contingency partners in periods of severe weather, including sharing timely information with customers to help them plan their journeys.

Highways England have adopted a number of approaches to address risks from heat, many of which are set out in the written evidence Highways England submitted to the Heatwaves: Adapting to Climate Change enquiry.⁵

Additional details on road surfacing and information that helps illustrate Highways England's approach to extreme heat include:

- good practice has been shared through the conference of European Directors of Roads, notably via a report on 'Adaptation to Climate Change' (CEDR, 2012) which included consideration a range of international research case studies including on the effects of hotter temperatures on bituminous pavements as well as the additional costs of maintenance;
- HE service providers are required to put in place severe weather plans to ensure resilience to adverse weather, including heatwaves. When there is a risk of the road surface temperature exceeding and sustaining temperatures over 50C for a period of time HE service providers would monitor conditions, utilising tools such as our network of road sensors, and respond as needed;
- within severe weather plans HE identify sections of network where heat could cause an issue such as structures, bridge joints, previous history of failure, and sections of concrete road surfaces. Some of these locations are recorded as 'vulnerable locations' as a result, and would be subject to close monitoring in such conditions;
- Highways England ensure that customers are informed about conditions so that they can adequately prepare for their journey. For example, Highways England advises road users when travelling during high temperatures to take a bottle of water with them before setting out to ensure they stay hydrated, to plan and

5 <http://data.parliament.uk/WrittenEvidence/CommitteeEvidence.svc/EvidenceDocument/Environmental%20Audit/Heatwaves%20Adapting%20to%20Climate%20Change/written/83054.html>

leave plenty of time for their journeys, to check the weather forecast for their destination and travel conditions before setting out and, where it is safe to do so, during journeys

- Highways England offer seasonal advice, including through public campaigns and through social media. Two recent campaigns include advice on vehicle checks before travelling in hot weather⁶ and a campaign to stop littering in order to reduce fire risk in hot weather⁷

Local Roads

Local roads are managed and maintained by local highway authorities who have statutory responsibility under the Highways Act 1980. It is for each highway authority to determine what maintenance service and regime, including materials, they undertake based on local knowledge, need and priorities. The Department for Transport provides funding and tools to help authorities undertake their statutory duties to maintain the roads for which they are responsible.

During the recent prolonged spell of hot weather in 2018, the heat caused bitumen to soften on a number of local roads in a few locations across the country. Several local highway authorities deployed their winter gritter fleets to spread granite rock dust on a few of their roads to create a non-stick layer between roads and vehicles and to stop them melting and to make them safe. By mitigating against the risk of melting roads there was little permanent damage caused to the network. If there is damage, however, the local highway authority would need to wait until the weather cools down to assess the locations for any repairs which may be needed. Asphalt melts and softens when it is hot, and goes hard and brittle when it is cold and due to this does not maintain the same strength all year round. However, not all road surfaces are made of the same type of asphalt, or tarmac, so the temperature at which roads melt varies. Most roads in the UK that experience a reasonable amount of traffic will start softening at 50C. Following a heatwave experienced in 1995, the highway sector introduced a new asphalt specification allowing asphalt surfacing to be made using polymer modified binders - which raises the softening point of the asphalt to around 80C. At present this type of tarmac is used on heavy-traffic roads.

The DfT also endorses the UK Road Liaison Group Code of Practice on Well Managed Highway Infrastructure-⁸ The Code is intended to apply throughout the United Kingdom. Whilst it is not statutory, it is designed to promote the adoption of an integrated asset management approach to local highway infrastructure for those authorities who are managing and maintaining road networks. The Code makes a number of recommendations which includes sections on climate change adaptation and recommends authorities undertake a risk assessment of the effects of extreme weather events on highway infrastructure assets to mitigate the impacts of the highest risks identified. It advises highway authorities to consider how various climate change variables such as intense or prolonged rainfall; hotter temperatures and higher wind speed will impact on the type of highway assets that they manage and the likelihood of these events occurring, such as

6 <https://www.gov.uk/government/news/hitting-the-road-for-the-holidays-check-before-you-travel>

7 <https://www.gov.uk/government/news/highways-england-warns-of-litter-risk-in-soaring-temperatures>

8 <http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=4F93BA10-D3B0-4222-827A8C48401B26AC>

carriageway heat damage. The majority of highway authorities are already implementing strategies to help ensure they maintain their highway assets so they are resilient in future climates, thus reducing the impact of extreme weather events, and where applicable, planning for future demands and risks that could be encountered.

DfT and UK Roads Liaison Group has published some key documents on climate change and highways including:

- **Maintaining Pavements in a Changing Climate.**⁹ This reports helps to improve understanding among local authority highways engineers, and those working on their behalf, of the effects and implications of changes in rainfall, temperature and wind speeds on the infrastructure of the highway network and its structures and how these might best be mitigated.
- **The Effects of Climate Change on highway pavements and how to minimise them** which provides the technical report which forms the basis of the above report.¹⁰

In addition, DfT is helping fund a project through the local highways maintenance Challenge Fund to repair 65.61km of drought-damaged fen roads across Cambridgeshire and in Peterborough. This investment is enabling the authorities to use innovative methods to maintain fen roads and enhance the resilience of the rural road network against future weather events.

DfT has also introduced an incentive element into the funding allocated to local highway authorities for local highways maintenance. This includes a self-assessment questionnaire¹¹ consisting of 22 questions that authorities have to complete that includes a section on resilience. The DfT is committed to continue to work closely with local highway authorities to ensure they develop a resilient local road network and are able to mitigate against climatic changes that maybe encountered now and in the future. As part of this the Department will continue to work with authorities to make sure they continue to regularly update and review their asset maintenance strategies/plans. This will guarantee that authorities are able to adapt the management and maintenance of the transport assets for which they are responsible to reflect the potential impacts of climate change and ensure highway networks are resilient.

DfT is aware that through the Association of Directors of Economy, Environment, Planning and Transport (ADEPT) has produced guidance on climate change, including heatwaves. For example, Milton Keynes Council undertook a first assessment of the possible vulnerabilities and risks faced by the council services due to climate change advice¹² and Climate UK have produced a resource for “Creating and Managing Resilient Local Highways”.¹³

9 <http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=77CBE77B-93A4-4D1D-B9782B47987990C1>

10 <http://www.ukroadsliaisongroup.org/en/utilities/document-summary.cfm?docid=6FBEB827-8EB0-4B15-A3B9B389E81796F3>

11 <https://www.gov.uk/government/publications/highways-maintenance-funding-incentive-element>

12 <http://ukclimateprojections.metoffice.gov.uk/23092>

13 http://www.climate-em.org.uk/images/uploads/5_Supporting_doc_resilient_local_highways_FINAL.pdf

Local bus and light rail network

It is in the best interests of **bus operators** to improve the conditions for passengers on their services. Operators are now purchasing buses with the maximum number of opening windows, tinted windows and forced air ventilation to help reduce the temperature in the bus during hot weather events. The report acknowledges that mechanical cooling systems on buses increase emissions, adding to both air pollution and greenhouse gases. However, as battery technology advances and ranges increase, some operators are now installing air conditioning on their electric buses. For example, new electric buses in Harrogate will have air conditioning installed.

Operators of light rail systems in the United Kingdom have procedures in place to manage severe weather events effectively, such as high temperatures, and will continue to undertake routine improvements where required. Operators ensure their infrastructure asset management plans are updated to help mitigate the risk of climate change for their operations. As part of any refurbishment works they are also ensuring their light rail tracks are up to a standard which can cope with extreme heat conditions. There are temperature variations across the UK which means operators have different measures in place that are appropriate for the localities they operate in. Some operators endorse public messaging during hot periods to ensure water is carried with passengers to avoid medical emergencies. Drivers and operational staff are encouraged to be extra vigilant to rail buckling and sagging overhead lines. Operators ensure more frequent track patrols by maintenance teams are undertaken. Speed restrictions are also implemented as a precaution at times either on a system-wide or location-specific basis depending on temperatures. Some operators have specific arrangements with weather monitoring and other advisory services in place to ensure they can plan ahead. One operator monitors potential track temperature by means of having a “dummy” rail at their engineering offices. This means that if critical rail temperatures are being reached they deploy watchmen at the locations identified as vulnerable. Overall operators reported few issues during the recent hot weather and that these issues were resolved quickly and did not cause major service disruptions in cities.

Network Rail

The resilience and operation of rail network infrastructure in the face of extreme environmental conditions including heatwaves is increasingly important. The Department for Transport’s High Level Output Specification for both 2014 to 2019 and 2019 to 2024 (Control Periods 5 and 6 respectively) contains specific requirements on Network Rail to “manage the resilience of the network to severe weather, taking account of the impacts of climate change, and to other potential threats”. The Government has set out a funding envelope for the rail network for Control Period 6 of £47.9 billion including a major increase in the allowance for renewals of the physical infrastructure and asset management to ensure the resilience of the network. This is a very significant investment which should ensure that the rail infrastructure is able to withstand increasingly extreme forms of weather. Improved asset management is a key part of Control Period 6 planning. Network Rail has developed guidelines for the management of hot (and cold) weather events to mitigate variations in temperature. These guidelines are followed by all train operating companies.

Overheating of equipment: The impact of severe weather events on the physical infrastructure and rolling stock can be significant. During extremely hot weather the physical track infrastructure has historically experienced significant levels of buckling of the physical rails. During the comparable high temperatures of 2003 (April to August) there were 137 instances of buckled rails. During the recent heatwave (April to mid-August 2018) the number of rails buckling has been far lower, a total of 23 reported on the network (out of a total of over 20,000 miles of track). The comparatively low instances of rail buckling indicates that Network Rail's improved asset management and preventative measures have resulted in less disruption to the operation of the network and the need for fewer remedial measures such as rerouting or train rescheduling.

Where equipment overheating mitigation measures such as speed restrictions or rerouting are implemented, in order to reduce the need for these measures, Network Rail has proactively been using thermal imagery to identify hotspots where electrical equipment is overheating. Early identification and targeted maintenance enables issues to be identified and fixed before they become severe enough to cause disruption. The impact of using thermal imagery has led to real benefits in reducing the need for mitigation measures particularly on routes which are operated at or near capacity.

Passenger welfare: The welfare of passengers is a key priority during extreme weather occurrences. DfT has taken several steps to improve the performance of all rail rolling stock from the point of view of the comfort of the passenger. In particular train manufacturers and operators are required to improve the resilience and operation of their rolling stock through their whole in service life. For the first time the Department has stipulated that industry must set out requirements on the fitment and performance of train HVAC systems (Heating Ventilation and Air Conditioning) to ensure that acceptable passenger environments can be provided during both normal and exceptional weather events. New rolling stock coming into service both on the national rail network and for Transport for London also utilises new ways of harnessing energy previously lost through braking and to reuse the energy for heating and cooling systems. The physical environment of the rail station is also being addressed. There have been new air conditioning systems at high use stations such as Kings Cross, which harness solar energy. Network Rail have also started to introduce free drinking water facilities and will continue to install these facilities in stations they are responsible for. The Rail Delivery Group has also issued industry wide guidance on behalf of the industry on passenger welfare including during exceptional weather events. To further improve the performance of the network and the passenger experience during exceptional weather events the Department will allocate innovation funding during 2019 via its Innovate UK rail innovations competitions.

Network Rail's climate change and adaptation policy has been developed for all its assets to tackle the impact of adverse weather including increased temperatures, wind and rain. This includes a number of Research Development & Technology (RD&T) initiatives proposed for the years ahead which will focus on developing improved measures to tackle extreme weather and climate change. Network Rail also have a train energy strategy which aligns with its sustainable energy strategy.

15. The Government should make businesses aware of the developing threat of heatwaves and the economic consequences. Public Health England should also issue formal guidance to employers to relax dress codes and allow flexible working when heatwave alerts are issued. The Government should consult on introducing maximum

workplace temperatures, especially for work that involves significant physical effort. Procurement rules should be updated so that schools and the NHS do not spend public money on infrastructure which is not resilient to heatwaves. The Department for Education should issue guidance for head teachers about safe temperatures in schools and relaxing the school uniform policy as appropriate during hot weather.

Adaptation and businesses

As mentioned above, Government's 2017 Climate Change Risk Assessment identifies risks to health, well-being and productivity from high temperatures as a top risk area where more action is needed. Government has acknowledged this risk and is working to ensure the appropriate departments, including BEIS, MHCLG and DH, take forward this commitment. The recent National Adaptation Programme has set out action across Government on the risks identified in the Climate Change Risk Assessment which includes severe weather events such as heatwaves.

The Adaptation Reporting Power, introduced under the Climate Change Act in 2008, is a useful tool to ensure that “persons or bodies with a function of a public nature” and “statutory undertaker” are taking action to adapt to climate change by reporting on how they are addressing current and future climate impacts. These reports also provide vital intelligence on the resilience of key sections of society.

Heatwave and the workplace

The Health and Safety Executive (HSE) is the regulator with responsibility for workplace health and safety, including thermal comfort in the workplace.

The Government has no plans to bring forward proposals to set a maximum permitted working temperature as there is an existing legal obligation on employers under the [Workplace \(Health, Safety and Welfare\) Regulations 1992](#) to provide a ‘reasonable’ temperature in the workplace.

In 2009, an independent review of workplace temperatures completed on behalf of HSE concluded that there is little evidence of significant numbers of cases of illnesses (long or short term, physical or psychological) caused or exacerbated by exposure to high temperatures at work and concludes that this is not an issue that justifies active regulatory intervention.

The scientific evidence supports this position, since air temperature is only one indicator of potential thermal discomfort in the upper range (e.g. a temperature above 25°C). Simple temperature limits would not prevent the more serious condition of heat stress from occurring and could be counterproductive from a health and safety perspective if inaction occurred below the upper limit. Other important factors, such as humidity, air velocity and radiant temperature, become more significant (and the interplay between them more complex) as the temperature rises. It is the employer's duty to determine, in consultation with their workforce, what is ‘reasonable comfort’ and to take action accordingly.

It is not possible to set a meaningful maximum figure due to factors, other than air temperature, which determine thermal comfort (for example, the radiant temperature, humidity and air velocity). These factors become more significant and the interplay

between them more complex as the temperature rises. It is the employer's duty to determine, in consultation with their workforce, what is 'reasonable comfort' and to take action accordingly.

The Approved Code of Practice (ACOP) on the regulations was reviewed in 2013 to make it easier for employers to understand and meet their legal obligations. In anticipation of the call for a maximum temperature, HSE produced improved information and advice alongside the revised ACOP.

Detailed guidance and advice on workplace temperature, thermal comfort and heat stress is available in the ACOP at <http://www.hse.gov.uk/pubns/books/l24.htm> and on the HSE website at <http://www.hse.gov.uk/temperature>. The guidance provides clear, user friendly information on common sense solutions and advice for employers and employees who may work in high temperature environments, for example, glass works, foundries, or during heatwaves. It includes how to carry out a thermal comfort assessment and measures that can be taken to improve thermal comfort. Appropriate controls covered in the guidance include relaxing staff dress codes so that workers can match their clothing to the temperature, shading windows, sitting workstations away from radiant heat, insulating plant or hot pipes and providing air-cooling where necessary. Where relaxing dress code may be less practical, for example when work involves wearing personal protective equipment (PPE), employers should consider rescheduling work to cooler times of the day, rotating tasks, providing more frequent breaks and ensuring that workers have access to plenty of cool drinking water. Employers should also periodically consider newer types of PPE that may improve the level of thermal comfort.

During the recent heatwave, HSE publicised this guidance on the home page of their website and on Twitter https://twitter.com/h_s_e/status/1012061775586648065?s=11.

Procurement rules and the NHS

The Government accepts this recommendation. DHSC can support the committee's desire to improve the resilience of NHS infrastructure through influencing the construction supply chain and is working with NHS Improvement on the most effective way to consider such issues at planning stages in the business case process.

Heatwave and schools

The Department for Education will work with Public Health England with a view to publishing guidance about safe temperatures in schools and relaxing school uniform policy during hot weather.