Briefing

Adapting to a changing climate: action to support national renewal

October 2024

Summary

Episodes of extreme weather in the UK are increasing due to climate change and are already posing a threat to security, resilience, health, the economy and infrastructure. Urgent action to cut emissions and stabilise global temperatures is needed to prevent the climate crisis from worsening, but some impacts are now inevitable.

Labour's five missions are a blueprint for national renewal. However, the impacts of climate change are barriers to progress that threaten the success of their agenda if ignored. But, as we highlight here, adapting proactively to climate change is a smart strategy to unlock the government's missions and to fulfil Labour's manifesto commitment on improving resilience.

Mission 1 – Kickstart economic growth

- **Prosperity.** The Office for Budget Responsibility (OBR) forecasts debt will increase more as a proportion of GDP in higher greenhouse gas emission scenarios. By reducing the direct (additional climate damage) and indirect (lost productivity and employment) costs of climate change, adaptation can improve financial sustainability.
- **Productivity.** An estimated 11 million hours of labour were lost in 2022 because of extreme heat. Investment in buildings to protect against extreme temperatures will be a stimulus to future work and productivity.

Mission 2 – Make Britain a clean energy superpower

- **Energy security.** The ambitious clean power mission will involve updating infrastructure. Resilience to extreme weather should be baked into new designs and retrofits to ensure security of supply and protect assets from damage.
- **Energy demand.** Reducing demand for energy will make the clean power target easier to achieve. Government commissioned research shows that passive cooling (changes to building design to reduce thermal gain) could play a significant role in cutting energy demand in coming decades and cut the cumulative costs of cooling significantly.

Mission 3 – Make Britain's streets safe

- **Crime prevention.** Violent crime is known to rise in hot weather, so the consequences of additional periods of extreme heat need to be better understood and prepared for and the additional expectations on emergency services must be anticipated.
- **Prison environments.** Seventy nine per cent of prisons and young offenders' institutions are at 'high' or 'very high' risk of overheating in the decades to 2040. Many are also at risk of flooding. Adapting prisons to cope with these effects will reduce suicide risk, aggression and aid offender rehabilitation, helping to cut crime.

Mission 4 – Breaking down barriers to opportunity

- **Reducing inequality.** The poorest fifth of English households are three times more likely to overheat than the richest fifth. Often these inequalities are split along racial lines as black and minority ethnic groups are disproportionately likely to live in cities that suffer from the urban heat island effect. Improving housing quality, with measures like ventilation and insulation, and increasing access to green spaces will help to reduce negative impacts on already disadvantaged groups.
- **Fulfilling potential**. Students taking exams in high heat achieve lower grades compared to those working in cooler temperatures. An environment that avoids overheating can help students reach their full potential.

Mission 5 - NHS fit for the future

- **Prevention.** There were 3,271 heat related deaths in summer 2022 and the Climate Change Committee (CCC) suggests the UK is experiencing an average of around 2,000 heat related deaths per year. Climate related health impacts are wide ranging including increasing the risk of dementia, PTSD and climate anxiety. Action to tackle climate threats will cut mortality and allow the NHS to concentrate resources on other illnesses.
- **Resilience against illness.** Alien invasive species like the tiger mosquito, are becoming more prevalent in Europe due to changes in temperature and moisture. Some dengue fever infections in recent years have been recorded as 'locally acquired' meaning they were bitten by mosquitos in Europe rather than imported by travel. Proactive measures are needed to guard against these risks.

Green Alliance's Adaptation Task Force is investigating the scope of adaptation required in the UK and the policy needed to support it.

Here, we propose that prioritising climate change adaptation measures will have significant co-benefits in helping the government to achieve its national renewal missions. It can unlock worker productivity (mission 1), boost energy efficiency (mission 2), ease pressure on prisons and public services (mission 3), enable communities to thrive (mission 4) and be part of a prevention first approach to healthcare (mission 5).

Terminology explained

Climate adaptation. This refers to changes in processes, practices and systems to moderate damage and benefit from any opportunities from climate change.[1] It can include national level actions including early warning systems for extreme weather events, local or community activity such as tree planting and individual actions such as installing shading devices in the home or closing shutters or curtains during the day to reduce heat gain.

Resilience. This is the ability to cope with and bounce back from climate shocks and to minimise damage to the economy, environment, society and wellbeing. Adaptation is often an important part of resilience and most measures help to build resilience.[2]

Climate adaptation and the government's missions

Below, we discuss in more detail how measures to make the UK more resilient to climate change will contribute to the government's missions.

Mission 1: Kickstart economic growth

"...to secure the highest sustained growth in the G7 – with good jobs and productivity growth in every part of the country making everyone, not just a few, better off."

Flooding, heatwaves and extreme weather are already causing economic disruption, reducing productivity, affecting agriculture and harming and disrupting communities, businesses and essential services. The OBR has examined the fiscal implications of different global warming scenarios, highlighting that continued action to curb emissions is needed, for economic as well as environmental reasons.

The costs of climate change are going to mount in the coming decades. The OBR models show that debt is projected to increase by 23 per cent of gross domestic product (GDP) under a scenario where global warming stays below 2°C, but projects a 33 per cent increase in a scenario where it rises to under 3°C.[3] Debt increases would result from direct costs (additional climate damage), indirect costs (lost productivity and employment) as well as additional debt servicing to pay for these impacts.[4]

If, as these scenarios depict, direct and indirect climate costs become a significant challenge to growth, it follows that measures to head off problems through adaptation will be crucial to fulfil this mission. By reducing the direct and indirect climate impacts, the government can reduce the debt caused by climate change, improving market confidence and providing more fiscal headroom for government investment.

Investment in adaptation is an 'invest to save' strategy. Adaptation measures that can be folded into existing spending priorities, or driven by regulation, behaviour change and private sector investment, will help to sustain long term growth.

Impact on productivity

The economic case for investment in adaptation can be seen around the productivity impacts of extreme heat. An estimated 11 million hours of labour were lost in 2022 alone, due to high heat exposure, across the agricultural, construction, manufacturing and service sectors.[5]

London, the UK's biggest financial centre, is losing around £577 million a year due to extreme heat.[6] By the 2050s, it is estimated that two to three per cent of London's GDP will be lost without climate adaptation.[7] And, without

some significant investments, such as the £16.2 billion identified for London flood defences 2023-2100, those impacts could be even greater.[8] Fortunately, the Mayor commissioned and published the London Climate Resilience Review, focussing on embracing adaptation to build resilience across the city.[9] While the delivery of measures identified by the report will be the key metric for its success, its learnings should be disseminated across other cities and regions across the UK.

Embedding adaptation across policy early will reduce long term costs as many investments are already required across infrastructure, housing and the natural environment. For example, building new homes away from high flood risk areas wherever possible, and ensuring resilience measures are embedded in design, will save money compared to building to lower standards in vulnerable places which would increase pressure for flood resilience retrofits and additional flood defences. This is important when the number of protected homes is already 40 per cent lower than planned.[10] Furthermore, insulating Britain's homes and buildings to improve energy efficiency and reduce heating bills can also help to tackle extreme heat and cold. However, care needs to be taken to ensure ventilation is considered alongside energy efficiency improvements to prevent excess heat build up.

Mission 2: Make Britain a clean energy superpower

"...to cut bills, create jobs and deliver security with cheaper, zero-carbon electricity by 2030, accelerating to net zero."

Climate change is putting pressure on power systems around the world, both from the impact of extreme weather and the increasing electricity demand associated with mechanical cooling. On numerous occasions in recent years, EDF has had to reduce output from its nuclear power stations across France as river temperatures rose too high to safely cool reactors.[11,12,13] Norway had to reduce hydropower output to save water during the 2022 heatwave due to a long dry spell.[14]

Extreme weather can threaten energy system resilience leading to outages in numerous ways: from flooded substations to snow, storm and lightning damage affecting energy assets. There has been some progress in recent years. Most substations across the country are floodproofed, for example, with plans to build defences for the rest by 2026.[15] Overhead cabling, however, is often decades old. Ofgem found that the age and condition of cabling was a factor in power outages following Storm Arwen in 2021.[16] At a system level, the CCC argues that there is not yet a defined standard for resilience which is crucial to set up, operate and maintain the network to withstand threats.[17]

Electrifying the economy increases the risk of cascading failures associated with power outages, so embedding resilience at every level will mitigate this risk. The government's target of a 2030 clean power system is an opportunity to design resilience into the new infrastructure needed to fulfill the mission and replace vulnerable parts of the system more quickly, fulfilling both adaptation and mitigation priorities. This way, resilience measures, from protecting energy assets from flooding to installing higher operating temperature cabling, can be implemented cost effectively without additional disruption to residents.

Reducing energy demand

An often overlooked element of the clean power aspiration is the need for energy demand management, which can reduce load on the grid and the threat of outages. Passive cooling, which uses building design to reduce heat gain over mechanical cooling techniques, is a prime example of how a climate adaptation measure can support the clean power mission.

As temperatures increase, remaining cool in residential and office buildings will be increasingly important. Due to the state of the UK's built environment, the use of active cooling measures such as air conditioning (AC) are likely to rise. But this will increase long term energy demand, drawing more power during heatwaves, making system level decarbonisation more difficult and reducing resilience. A holistic plan for future cooling that takes a passive first approach can, therefore, benefit the clean power mission, as well as providing healthier and more comfortable buildings.

Government commissioned research shows that between 2020 and 2100, under a high emissions scenario, a market led approach to cooling could lead to a 12 terawatt hour (12 trillion watt hours) increase in energy demand. A passive first approach, however, could reduce that by a third under the same scenario. A passive first approach, combined with rapid action to cut emissions, would help to keep energy demand relatively flat over the rest of the century.[18]

Early investment in adaptation also reduces costs. The cumulative costs of a non-intervention approach reach £60-70 billion by 2050, whereas a proactive passive first approach would lower that cost to £20-30 billion, freeing up private and public capital for other purposes.[19]

Housebuilding

Although not an official mission, the government has been clear that housebuilding is high on its agenda. The commitment to building 1.5 million new homes by 2030 to alleviate the UK's housing crisis is an ambitious target. Changes to the National Planning Policy Framework and the Future Homes Standard should reflect the need for all new towns and homes to be

built with future needs in mind, with passive cooling measures, including shading devices, cool roofs and good ventilation, as standard.

The location of homes is also crucial. Homes continue to be built on floodplains without appropriate resilience measures.[20] The planning system ultimately needs to account for flood risk so that developers factor resilience measures into building costs and incentivise the development of lower risk sites.

Mission 3: Make Britain's streets safe

"...by halving serious violent crime and raising confidence in the police and criminal justice system to its highest levels."

Studies around the world suggest that violent crime increases in warmer temperatures.[21] This may be partly opportunity related but research does not rule out the potential psychological impacts of hot weather on decision making. While specific grievances drive major events like riots, given the higher risks of extreme heat in future, its potential consequences for public disorder should be better understood and prepared for.

A primary impact will be on policing and emergency service capacity. The working conditions of services will be directly affected, reducing their capacity to manage situations effectively, and there will be additional pressure to support resilience efforts.

Emergent 'resilience policing' models, where the police help communities prepare for and respond to climate threats, were used in the Australian state of Victoria during the 2019-20 bushfires.[22] But responding to events related to climate impacts will stretch the police's ability to focus on wider case work and crime prevention.

The state of UK prisons will further undermine the ability to deliver justice. Recent figures show that, due to the age and condition of buildings, they are vulnerable to climate impacts, particularly overheating. For the period to 2040, 79 per cent of prisons and young offenders' institutes are at 'high' or 'very high' risk of overheating in the summer. And from 2040 to 2050, all investigated institutions would be at 'high' or 'very high' risk of overheating.[23]

Many sites are also vulnerable to flooding. Forty one per cent of prisons and young offenders institutes are at 'high' or 'very high' risk of flooding between 2020 and 2039, increasing to 69 per cent a decade later.[24] A flooded or overheated prison reduces the justice system's capacity across an already stretched estate, by shutting down facilities and impacting staff working conditions. In assessing risks, the Ministry of Justice has identified the need

for an adaptation strategy to protect the public, reduce reoffending and deliver swift justice.[25]

Climate vulnerability in prisons reinforces the cycle of violence. There is a recognised associated between extreme heat and prisoner suicide.[26] Prisons also attempt to provide some levels of support to reduce reoffending, including educational opportunities, employment and vocational activities to prepare prisoners for societal reintegration.[27] However, extreme heat impacts sleep and cognitive function, undermining these interventions, and is corelated with increased aggression.[28,29] Together, these factors demonstrate that the condition of the prison estate is not conducive to rehabilitation, increasing the likelihood of reoffending and higher crime levels.

Mission 4: Breaking down barriers to opportunity

"...by reforming our childcare and education systems, to make sure there is no class ceiling on the ambitions of young people in Britain."

Climate change impacts are known to be disproportionately experienced by those in poverty around the world.[30] They are also unequal across race and class lines in the UK.

Simple forms of community adaptation, such as access to green spaces, are a good example. Only 46 per cent of households with an annual income under £15,000 live close to a green space, which is important for shade and outdoor space in hot weather, compared to 70 per cent of people whose annual household income is over £35,000.[31]

Moreover, the impacts of extreme heat are amplified by the 'urban heat island effect'. The overwhelming majority of black and minority ethnic groups living in urban areas are disproportionately affected by this.[32] Those on low incomes in urban areas struggle with extreme heat, largely due to bad quality housing and inadequate infrastructure, resulting in the poorest fifth of English households being three times more likely to overheat than the richest fifth.[33]

The Resolution Foundation has found that the poorest UK houses are most exposed to the financial consequences of flooding, in part due to lower insurance cover in the lowest income brackets.[34] This risk is likely to grow without concerted action as the demand for homes is leading to further building in flood risk areas, increasing insurance premiums.

Climate change is a 'threat multiplier' as its impacts increase pre-existing vulnerabilities. Poorer households are far less able to effectively prepare for, or bounce back from, extreme weather impacts. Private renters, for example,

have less ability than homeowners to install the technologies and measures that could help them cope with extreme heat or cold.

Breaking down barriers to opportunity cannot just be about education reform. School, community and home environments also influence outcomes for children and young people and must be tackled too, alongside alleviating poverty. For example, students taking an exam in 32°C heat could be ten per cent less likely to pass than those taking the exam in 22°C.[35] Adaptation measures can help to level the playing field, allowing wider reforms to fulfil their potential and improve people's life chances but, too often, high temperatures are being registered in classrooms, disrupting learning.[36]

Mission 5: Build an NHS fit for the future

"...that is there when people need it; with fewer lives lost to the biggest killers; in a fairer Britain, where everyone lives well for longer."

The health impacts of climate change are often underappreciated. In the UK, wildfires, storms and floods have not yet resulted in significant numbers of deaths or harm, but these threats are predicted to increase. More serious events are starting to occur. In 2021, almost 200 people died in central Europe in one flooding episode.[37] Extreme heat already more regularly and directly affects people in the UK. On average, there are around 2,000 heat related deaths a year.[38] During especially hot summers, this number can be much higher. In the summer of 2022, when temperatures over 40°C were recorded for the first time, there were 3,271 heat related deaths.[39] In healthcare settings, a temperature of 26°C and above is classed as overheating and 90 per cent of hospitals in England have been assessed as vulnerable to these high temperatures.

While not comparable to the UK's biggest killers, these impacts are not trivial and cannot be ignored. Most deaths are in vulnerable groups and so climate impacts intersect with other major health conditions.

In 2019, the Environmental Audit Committee highlighted that threats from alien invasive species are increasing, with potential harm to biodiversity and human health.[40] Europe has reported significant dengue fever cases in recent years, some of which are now locally acquired infections from the Asian tiger mosquito, showing its habitat spread as temperature and moisture levels change across the continent.[41]

Mental health is central to "living well for longer". But, in periods of high heat for instance, mental health problems can be exacerbated. In some circumstances, mental health related hospital admissions have risen by almost ten per cent during heatwaves.[42] Suicide risk also rises, as do dementia related hospital admissions.[43, 44] Sleep and cognitive function are

impaired. Floods can cause PTSD and depression if people are displaced from their homes.[45] And chronic anxiety about the future is rising, as people increasingly fear the effects of climate change.[46]

Recognising and addressing these issues through effective adaptation can help to reduce demands on the NHS. One highly effective climate adaptation solution, among many that can support health outcomes, is providing people with greater access to nature. Urban green spaces are known to help boost mental health while also supporting urban drainage and providing shade and a cooling effect in high temperatures.[47,48,49]

The NHS is aware of the need to adapt to climate change. It published its third health and care adaptation report in 2021 and has asked NHS Trusts to produce Green Plans which align with net zero and incorporate adaptation measures.[50,51]

Recommendations

Climate change impacts are being widely felt and are increasing, from heat related mortality to instances of extreme weather and falling productivity. But how we experience these future impacts will depend on the action taken by government now. Investment in adaptation will decrease climate costs, create a healthier population, break down inequalities, secure the UK's position as a clean energy superpower and create a safer country to live in.

To fulfil this potential, the government should first:

- Develop an 'adaptation test' to scrutinise the compatibility of all major government policy with future climate change scenarios and ensure the test is embedded across government departments.
- Embed climate adaptation into the terms of reference of all government mission boards and hold these bodies accountable for delivery.
- Introduce a minister for adaptation within the Cabinet Office responsible for delivery of the National Adaptation Programme.
- Review and update the National Adaptation Programme with a focus on developing clear metrics and deliverable targets.

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Endnotes

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