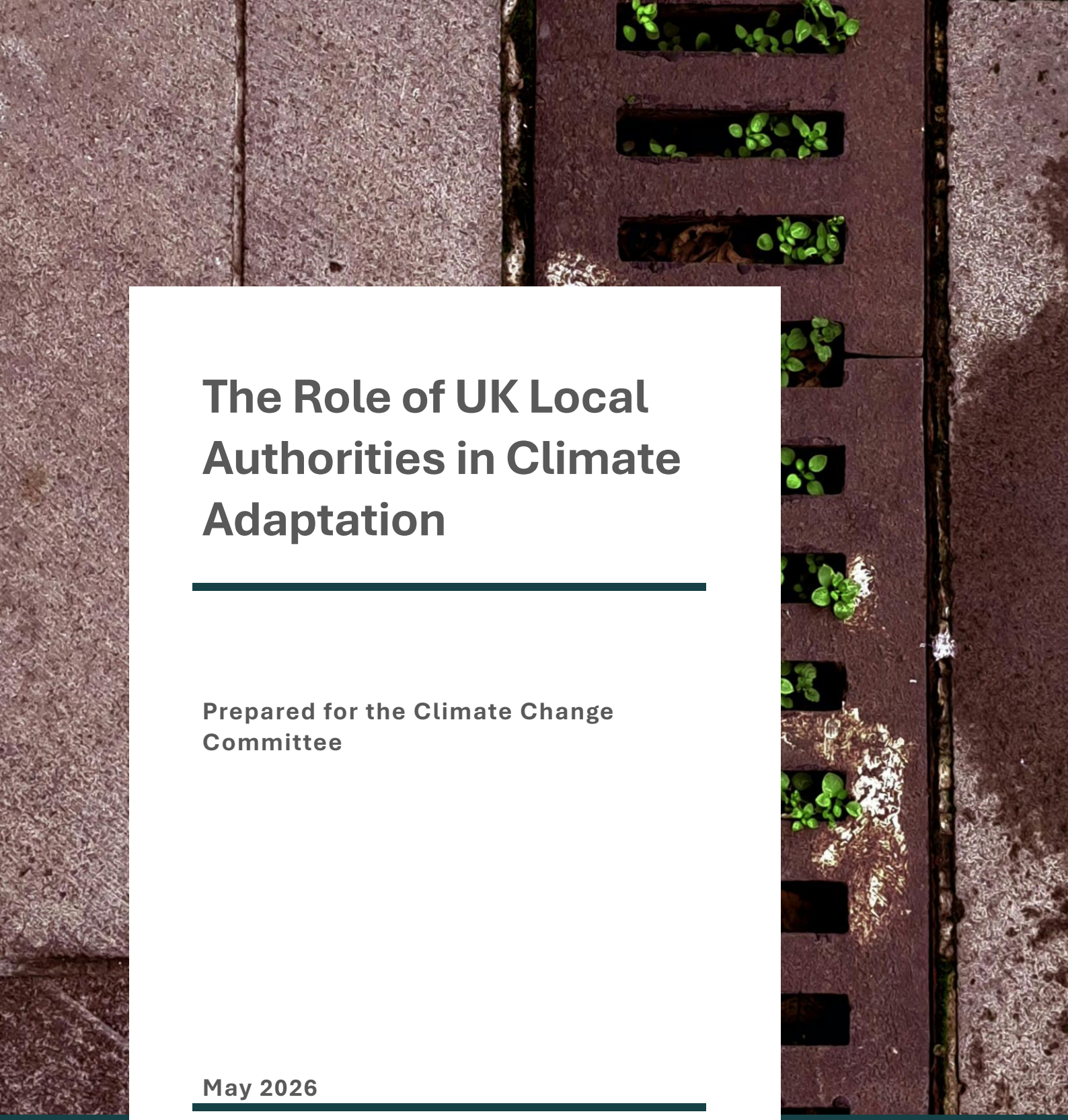

The Role of UK Local Authorities in Climate Adaptation

Prepared for the Climate Change Committee

May 2026

CAG Consultants

Client Name: Climate Change Committee
Project Title: Developing local area advice for climate change mitigation and adaptation

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Executive summary

Background

The UK is already experiencing warmer, wetter winters; hotter, drier summers; and rising sea levels, which are driving growing risks from flooding, heat stress, and drought to infrastructure, nature, and communities. The UK needs to adapt to today's extreme weather and future risks.

The UK Climate Change Committee (CCC) commissioned CAG Consultants to investigate the role of local authorities in adapting to climate change in the UK, to help inform the CCC's advice to government.

What does this report cover?

This report explores the role of local authorities in adapting to climate change in the UK. It maps their current responsibilities against the practical actions needed, identifies the key challenges they face, and proposes the changes required to help create a more effective local response. It builds on an earlier report[1] outlining the duties and powers of local authorities in relation to adaptation.

After an introduction in Chapter 1, this report is structured to answer three key questions:

- **What is the current context?** Chapter 2 gives an overview of the UK's climate response framework and the existing roles and responsibilities of local authorities.
- **What are current drivers and barriers to local adaptation?** Chapter 3 provides an analysis of current drivers and the key barriers to local authority action on adaptation, such as funding, capacity, and policy gaps.
- **What actions can local authorities take?** Chapter 4 looks at specific areas, such as transport, health, and land, and the practical steps local authorities can take to help the UK and local areas adapt effectively.

This executive summary provides a brief overview of the key takeaways from each chapter.

[1] Duties and powers of local authorities in the UK to adapt to climate change - UK Climate Risk

Chapter 2 summary: What is the current context?

Local authorities have a key role to play

Local authorities across England, Scotland, Wales and Northern Ireland play a key role across multiple aspects of the UK's adaptation to climate change impacts:

- **Local authorities own, manage or commission services and infrastructure that will need to adapt to a changing climate.** This includes, for example, council owned property, local transport infrastructure and drainage systems, as well as the management and commissioning of social care services.
- **Local authorities have local plan making and planning functions that serve as a crucial lever for ensuring the future resilience of development location and design.** Through these functions, they can help ensure that developments are sited away from high-risk areas, such as those prone to flooding, and are designed to withstand current and future extreme weather events.
- In England and Wales, **Lead Local Flood Authorities (county councils and unitary authorities) are responsible for managing flood risk from surface water, groundwater and small watercourses in their area.** They help prevent and respond to flooding by planning local strategies, maintaining drainage systems, and working with communities to keep people and property safe.
- **Local authorities are Category 1 responders** under the UK Civil Contingencies Act 2004 and are therefore required to prepare for and respond to emergencies, including extreme weather events. In their emergency planning and response, they also have a duty to identify and support vulnerable people who may be at increased risk from climate impacts.
- **Local authorities hold local knowledge** to inform national policies and funding decisions. They also provide local leadership by raising awareness, sharing information, and informing households and businesses on how to prepare for climate impacts.

National frameworks and statutory duties shape what local authorities can do

- **The Climate Change Act 2008 establishes the overarching UK framework for adaptation.** It requires the UK government to publish a Climate Change Risk Assessment (CCRA) every five years, which provides an up-to-date summary of the scientific evidence and understanding of the specific climate change risks and opportunities the UK faces. The Act requires the Climate Change Committee (CCC) to provide advice on the government's CCRA. The UK government's fourth CCRA is due to be published in 2027, informed by the CCC's independent assessment (CCRA4-IA).

- **The Climate Change Act 2008 and national equivalents also require that each nation within the UK has a National Adaptation Programme (NAP)** that sets out the government's plans and actions to address the risks and opportunities identified in the CCRA.
- While the 2008 Act sets the overarching UK framework, Scotland, Wales and Northern Ireland have also established their own specific climate change acts with distinct targets and duties.
- **Local adaptation is also influenced by national policies on planning, building standards, infrastructure, and emergency management** - areas where local authorities must comply with national rules and regulations. Because the majority of local authority adaptation funding comes from national governments, councils often act as delivery agents of national priorities, with their ability to act dependent on national funding cycles and policy direction.

Local authorities operate in a complex, multi-layered governance landscape

- **Responsibilities are distributed across different tiers of government** - county, district, unitary, combined and principal authorities - and these arrangements vary across the four nations.
- **Councils must navigate interactions and overlapping mandates** with central government departments (including Department for Environment, Food and Rural Affairs (Defra) as the lead department for adaptation), neighbouring authorities, and regional and national agencies such as the Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales, Ofgem and Local Resilience Forums.

Different national structures and powers of local government

The structure and powers of local government vary significantly across the UK and are evolving (e.g. through local government reorganisation and devolution), shaping the scope for local adaptation:

- **England** has a mix of two-tier and unitary arrangements, and no overarching statutory duty requiring local authorities to plan for climate adaptation. In England local adaptation action relies on sector specific duties (for example flood management, planning and emergency response), and voluntary reporting, rather than a single overarching adaptation mandate.
- The unitary structures in **Scotland** and **Wales** simplify responsibility. Both nations have integrated adaptation into broader statutory frameworks - the

Climate Change (Scotland) Act and the *Well-being of Future Generations (Wales) Act* - that place clear duties to act to ensure long-term resilience on local authorities. Wales also has statutory regional collaboration mechanisms (Public Service Boards and Corporate Joint Committees) that support joint planning and collaboration.

- **Northern Ireland** councils have a narrower remit, with many key adaptation related functions - such as transport, planning and housing - retained by national government departments. The Climate Change Act (Northern Ireland) 2022 has introduced statutory adaptation reporting, but the scope of local powers remains limited.

Chapter 3 summary: What are current drivers and barriers to local adaptation?

What is the current state of local authority climate adaptation preparedness in the UK?

Across the UK, formal adaptation planning remains inconsistent.

- Only a small number of English local authorities have submitted voluntary reports on their adaptation planning and activity; fewer than one-third of Scottish councils have standalone adaptation plans; in Wales, only around half have integrated adaptation into broader climate strategies; and progress varies widely in Northern Ireland.
- Adaptation is often embedded within broader climate or sustainability documents, which can help mainstream the agenda but also risks adaptation being a lesser priority.
- Nonetheless, some councils - such as Edinburgh and Cambridge - demonstrate more developed, collaborative, and risk-based approaches.

Risk assessment practices, which involve identifying local climate risks and potential impacts, show similar variability.

- Only around a quarter of English local authorities have climate risk registers, and evidence from workshops with local authority officers suggest many have yet to conduct formal risk assessments.
- Scotland reports wider use of Climate Change Risk Assessments, though these often focus only on hazards rather than vulnerability.
- Wales' Public Services Boards have committed to conducting formal risk assessments, signalling a move toward more consistent practice.

- In Northern Ireland, individual councils (e.g., Belfast and Ards and North Down Borough Council) are developing their own climate risk registers aligned with adaptation planning.

Overall, while awareness of climate risk is growing and pockets of good practice exist, local adaptation preparedness remains patchy.

What could unlock progress in local authority adaptation planning and action?

An engagement exercise with local authority officers explored barriers and drivers of effective local adaptation action.

Approach to workshops

Two online workshops held in April 2025 brought together more than 240 officers from councils across all four UK nations to share their experiences, priorities and challenges on climate adaptation. Insights from these sessions (including voting results and detailed written comments) form a major part of the evidence base for this section on what can unlock progress in local authority adaptation planning and action. This is then supplemented by the expertise of the authors.

How can national governments support effective local adaptation?

Local authorities consistently indicated that more effective local adaptation depends on stronger national support, and they identified several key areas where government action would make the greatest difference:

1) Visible and consistent national leadership: Officers stressed the need for strong, sustained national leadership that treats climate adaptation as a strategic priority rather than an add-on.

- This includes a **clear articulation of roles and responsibilities** between national and local government, improved cross government coordination, and explicit signals that adaptation should be mainstreamed across all public services.
- Officers also asked for a **shared national understanding of what "good" local adaptation looks like**, including clearer objectives, standards, and expectations to guide local decision-making.

2) Long-term and accessible funding: A central message from local authorities was that adaptation cannot be effectively delivered on the current funding model.

- Local authority representatives report severe resource constraints, with many relying on small teams to manage growing climate risks.

- Short-term, competitive grant funds were seen as inefficient, unpredictable, and poorly suited for long-term climate resilience work.
- Local authorities called for stable**, multi-year, ring-fenced funding streams that support the full cycle of adaptation - from risk assessment and planning to implementation, monitoring, and maintenance**. Without this, officers said adaptation continues to be deprioritised relative to statutory services and immediate crises.

3) A statutory duty for local adaptation, backed by resources: Officers were clear that a statutory duty is one of the single most important levers governments could introduce.

- They felt that the absence of such a duty (outside Scotland) makes it extremely difficult to secure political buy-in, justify officer time, or attract investment.
- Officers thought a statutory requirement to manage risks from climate change across all council activities (paired with adequate funding) would elevate adaptation across all council departments, embed it into corporate risk processes, and establish a level playing field across the UK.
- Officers said the duty should also include **mandatory adaptation reporting**, building on existing arrangements in Scotland and Northern Ireland, to support transparency, identify capacity gaps, and track progress over time.

4) Practical support, tools, data and capacity-building: Local authority representatives repeatedly emphasised the need for **practical, accessible support** from national governments. Good practice exists and is often enabled by collaboration, shared learning, and specialist expertise. Local authorities wanted national governments to expand this kind of support by:

- providing training and skills development, particularly on understanding climate projections, risk assessments, and adaptation business cases;
- establishing and maintaining high quality, localised climate data and tools;
- enabling peer-to-peer learning, mentoring, and communities of practice;
- offering clear, practical guidance, templates, and worked examples to reduce duplication of effort; and
- improving horizontal and vertical coordination, especially on cross-boundary risks and with infrastructure providers.

What can local authorities do to accelerate local climate adaptation?

Although national governments play a crucial enabling role, local authorities themselves have scope to strengthen their climate adaptation practice. The engagement with local authorities described above, supplemented by case studies, shows that local authorities can take the following steps to strengthen local climate adaptation through measures including:

1) Strengthening internal leadership and making adaptation a whole council priority: A recurring theme is the need for stronger internal leadership and clearer accountability.

- Progress improves when adaptation is treated as a corporate priority led by senior management and embedded across all services - not left solely to specialist officers.
- This means integrating climate risk into corporate risk registers, governance processes, procurement, planning, asset management and service delivery.

2) Building and participating in strong partnerships and collaborative networks: Local authorities emphasise that adaptation requires coordination beyond individual organisational boundaries.

- Strengthening internal collaboration, working with neighbouring councils, and participating in regional partnerships can help address transboundary risks such as flooding, water scarcity, coastal change and biodiversity loss.
- Effective partnerships with community groups, businesses, infrastructure providers, and academic institutions allow councils to draw on wider expertise and co-develop solutions.
- However, collaboration requires dedicated officer time, supportive governance arrangements, and improved mechanisms for data sharing - particularly with infrastructure operators, where information gaps remain a major barrier.

3) Investing in adaptation skills, knowledge, and dedicated capacity: Many authorities lack the specialist skills and staff capacity needed to manage climate risk effectively.

- Councils can make progress by investing in staff training on climate science, risk assessment, adaptation planning, cost–benefit appraisal, and risk communication.
- Creating dedicated adaptation roles or teams (where feasible) or clearly assigning adaptation responsibilities within existing roles helps ensure this work receives sustained attention.

- Regular knowledge sharing, internal communities of practice, and participation in regional or national learning networks can also raise capability.

4) Exploring diverse funding approaches and strengthening business cases: While long-term national funding remains critical, local authorities can improve their ability to deliver adaptation by exploring a wider range of local financing opportunities.

- These include public–private partnerships, philanthropic support, community investment or crowdfunding models, municipal or green bonds, targeted local levies (where permitted), and maximising developer contributions for green and resilient infrastructure.
- Examples such as the Wyre Natural Flood Management project show how innovative financial models, such as funding partnerships including private utility companies and investors, can unlock private capital for resilience.
- To take advantage of these approaches, councils need to develop stronger business cases that quantify the benefits and co-benefits of adaptation, including health, economic development and environmental gains.

5) Enhancing public engagement and communicating the co-benefits of adaptation: Local authorities can make significant progress by strengthening how they engage communities on climate risks and resilience.

- Many residents have limited awareness or "headspace" to engage with adaptation, so councils need to communicate in clear, accessible language and focus on making climate impacts and solutions relevant to everyday concerns.
- A particularly effective approach is to highlight the co-benefits of adaptation - such as improved health and wellbeing from urban greening, enhanced biodiversity, safer and more pleasant public spaces, lower energy bills, and local economic development.
- Tailored, locally led engagement that works with communities to identify their priorities and co-design solutions can build ownership and trust, and leads to more sustainable, inclusive and context appropriate outcomes.

Chapter 4 summary: What actions can local authorities take?

There are several overarching principles that can guide effective local authority action on climate adaptation, as well as actions specific to each adaptation system.

Adaptation systems are the sectors or areas that need to adapt to climate change and include land, sea, water and wastewater, energy, waste, digital and telecoms, transport,

built environment and communities, public services, health, culture and economy and finance.

This report was finalised ahead of the publication of the CCC's 2026 advice on adaptation, therefore some system descriptions and some of the assessments in relation to system resilience may differ slightly from the current CCC advice.

This summary only includes the priority actions for local authorities from across adaptation systems. Priority actions are both in areas where local authorities hold the greatest direct influence, and in those where adaptation progress depends heavily on strong local authority leadership and support. A longer list of local authority actions for each adaptation system and UK specific considerations are explored in the full report, but not included in this executive summary.

Overarching principles for local authority climate adaptation

To effectively address the complex challenges of adaptation, local authority actions should be guided by several overarching principles:

- **Integrated approach:** Local authorities should embed climate adaptation across all relevant policies, plans and decision-making processes (e.g. Local Plans, Local Nature Recovery Strategies, economic and development strategies) so that it becomes a core consideration rather than a standalone activity.
- **Evidence-based decision making:** Adaptation actions should be guided by robust scientific evidence, including UKCP climate projections, national and local risk assessments, and locally collected data and intelligence, including lived experiences.
- **Nature-based solutions (NbS):** Councils should consider nature-based solutions alongside other options and ensure their wider benefits - such as biodiversity, water management, carbon storage and health - are fully reflected in adaptation business cases.
- **Partnership working:** Effective adaptation requires collaboration with agencies, neighbouring local authorities, businesses, landowners, academic partners, voluntary organisations and community groups.
- **Community engagement and empowerment:** Local authorities should actively engage communities, raise awareness of local risks, and co-design adaptation solutions that reflect local needs and values.
- **Adaptive management:** Adaptation must be treated as an ongoing process, with monitoring, evaluation and iterative adjustment as climate information, risks and priorities evolve.

The role of local authorities in delivering large adaptation projects

Flood and coastal erosion risk management schemes are mainly funded nationally, with local contributions and investments encouraged or required depending on the size of the investment.

- In England the Environment Agency (EA) funds these major schemes and prioritises areas with greater risks and higher value for money projects, and aims to ensure that deprived communities and natural flood management receive an increased share of funding. Large adaptation schemes under £3m can be fully funded by the EA, while more expensive schemes require a 10% contribution from partners, which can include local authorities.
- In Wales, large schemes are primarily funded through Welsh Government capital grants administered via Natural Resources Wales, with local authorities contributing match funding.
- In Scotland the Scottish Government provides the majority of funding for major flood-protection schemes, while local authorities deliver and procure the schemes themselves, supported by SEPA's strategic guidance. This gives councils a larger direct delivery role than in England or Wales.
- In Northern Ireland, DfI Rivers funds and delivers most major flood-risk infrastructure, with local councils playing only a limited role in financing or scheme delivery, reflecting the more centralised governance structure.

Local authorities play a key role in major adaptation projects by contributing local knowledge, shaping priorities and helping align national programmes with community needs. Where local authorities lead schemes, they develop business cases, manage procurement and oversee design, delivery and maintenance (working closely with national agencies). Across all nations, local authorities also exercise key planning and consenting powers, secure land and permissions, and coordinate community engagement.

The role of local authorities in Local Resilience Forums (LRF)

Local authorities play a leading role in Local Resilience Forums, often through chairing or co-chairing. LRFs bring together local authorities, emergency services and other key stakeholders in emergency planning and response, such as utility companies, to plan for and respond to major incidents. They are critical for managing the immediate impacts of extreme weather and coordinating recovery, while also informing longer-term adaptation planning to protect vulnerable communities and essential services. The structure of these forums differ across the nations of the UK.

Local authority priority actions for climate adaptation

Chapter 4 outlines a list of adaptation actions local authorities can take for each adaptation system. Here we highlight only the suggested priority actions from across the different adaptation systems:

- **Adapting local authority-owned buildings and assets**: Local authorities can implement adaptation measures by retrofitting existing buildings (residential and non-residential) to increase resilience to overheating, implement property-level flood protection measures, and ensure good indoor air quality and water efficiency. Local authorities can ensure their own critical buildings are resilient to power outages and disruptions in fuel supply due to climate impacts. This involves assessing vulnerabilities and implementing measures like backup power generation for facilities crucial for emergency response or community support. They should also ensure that other assets such as waste management infrastructure or cultural assets are resilient to future extreme weather.
- **Adapting local authority operations and services:** Local authorities can ensure that council care services, waste and emergency communication services are adapted to extreme weather and there are plans in place to ensure business continuity.
    - Local authorities can develop, regularly review, and test their own specific emergency plans and departmental business continuity plans, ensuring they are informed by future climate projections and address a wide range of climate hazards and plan for potential transport, energy and telecommunication disruptions from climate impacts.
    - Where local authorities own, operate or commission care services (such as care homes), they have a direct role in ensuring safe, heat-adaptive care. This includes maintaining hydration, providing cooling and shaded spaces, identifying residents at higher risk, and adjusting care routines during heatwaves as well as ensuring staff safety.
    - Local authorities can ensure business continuity plans for adult social care and children's services explicitly cover extreme weather disruption (e.g., loss of access, staff shortages, power/telecoms outages), with arrangements for prioritising welfare checks and statutory visits, maintaining contact with high-risk individuals, and securing contingency capacity across commissioned providers (including domiciliary care and residential placements).
    - Waste services business continuity plans should explicitly address a range of climate impacts (e.g., prolonged heatwaves, widespread flooding, consecutive storms) and identify alternative collection routes, temporary waste storage locations, mutual aid agreements with neighbouring authorities, and strategies for rapid service recovery.
    - Local authorities can ensure that any emergency communication systems they directly manage or rely upon (e.g., for internal council coordination, communication with emergency responders, or community alert systems) have resilient backhaul connectivity and thoroughly tested power and data backup systems.

- **Adapting the local road network and associated infrastructure:** Local highways authorities can implement enhanced and proactive maintenance regimes for drainage systems (gullies, culverts, ditches) on local roads and pavements to reduce surface water flood risk. They can strengthen roads and pavements against extreme heat and water damage by using more heat and water-resilient asphalt mixes, improving surface treatments, and adjusting maintenance schedules to repair early signs of rutting or softening. Local highways authorities are responsible for designing and managing their local road networks to enhance overall resilience. This involves identifying critical routes that need to be kept open during emergencies, planning and signing robust diversion routes, and implementing traffic management measures that can also incorporate green infrastructure elements (e.g., tree planting for shade, rain gardens in verges).
- **Adaptive use and management of local authority-owned land:** Local authorities can use their own land to provide adaptation solutions and manage it in a way that supports climate adaptation.
    - Coastal land can be managed proactively to implement projects and measures that enhance natural coastal defences and protect coastal margins.
    - Agricultural land (e.g. county farms) can be managed to restore wetlands, floodplain meadows, species-rich grassland or agroforestry systems to support adaptation to flooding and droughts.
    - Local authorities can implement and showcase climate-resilient management practices in council-owned woodlands and create new climate-resilient woodlands on council-owned land.
    - Local authorities can restore peatlands and manage upland areas by blocking drainage ditches to keep soil wet. This helps prevent wildfires and slows water flow to reduce downstream flooding.
    - Local authorities can plant trees along riverbanks to cool water temperature and support habitats and reconnect rivers, streams, wetlands and ponds to slow waterflow, reduce flood risk and improve resilience.
    - Local authorities can introduce green and blue infrastructure (e.g. trees, parks or ponds) and adjust maintenance regimes on council-owned land to help manage heat and flooding, especially in urban areas, and increase water efficiency.
- **Climate resilience in local plans, planning policies and local strategies:** Local plans, strategies and planning policies can support resilience by:
    - When assessing appropriate locations for new developments, including new homes, energy, water, waste and telecommunication infrastructure, road and rail infrastructure, business developments and public services,

ensuring that developments of homes and critical infrastructure is steered away from high-risk areas - such as floodplains, eroding coasts or landslide-prone zones. Spatial planning should also consider the impact of developments on different freshwater systems and habitats.
    - Requiring new developments to incorporate adaptation measures such as Sustainable Drainage Systems, green and blue infrastructure, heat or flood resilient material, homes designed to avoid overheating, and raising developments above projected flood levels.
    - Allocating land for land use that supports adaptation, such as the creation of woodlands and fresh water systems or new water reservoirs where needed.
    - Embedding objectives for climate resilient management of for example farmed land, woodland, and peatland.
- **Lead Local Flood Authority responsibilities:** In many areas, local authorities act as Lead Local Flood Authorities and are responsible for managing the risk of flooding from surface water, groundwater, and ordinary watercourses. This gives local authorities direct control over local flood risk planning. This role includes:
    - mapping and monitoring flood risks and flood hotspots and producing local flood risk management strategies,
    - designing and funding small-scale flood defence schemes such as culverts or ditches,
    - responding to flood events and investigating causes,
    - coordinating partners in flood prevention and response (e.g. Environment Agency, water companies, highways authorities).
- **Emergency response role:** Local authorities have a direct role as emergency responders during extreme weather events or climate related transport, water, telecoms or energy disruptions. They run or support community hubs, rest centres, and welfare checks that provide practical support to residents, especially during extreme weather. This includes keeping key buildings ready to open as safe, warm or cool spaces, ensuring they have backup power where needed, and coordinating local emergency support with partners. Collaboration with Local Resilience Forums (LRFs) is important for effective emergency planning, response, and recovery related to disruptions. Local authorities can establish clear, pre-agreed communication protocols for informing the public during extreme weather events or climate-related disruptions.
- **Environmental and public health:** Environmental health teams can identify and respond to risks linked to overheating, damp and mould, poor ventilation, and indoor air quality, particularly in private rented housing. These powers are especially important for protecting vulnerable residents during heatwaves or periods of prolonged damp weather. Local authorities also have direct responsibilities for food safety. As temperatures rise, these powers can be used

to ensure food providers have appropriate measures in place to prevent food spoilage and bacterial growth during warm weather. Local authorities further have a statutory role in local public health preparedness, including contributing to monitoring, preventing and managing of climate-related health risks such as vector-borne diseases.

- **Supporting vulnerable residents:** Local authorities have a responsibility to identify and support vulnerable residents who are disproportionately affected by extreme weather and climate related disruptions. They should work with utility companies to ensure eligible residents are registered on Priority Services Registers (PSRs), which offer additional support during outages. They should also proactively raise awareness of the assistance that telecoms providers must offer to people who rely solely on landlines or telecare services during power cuts.
- **Raising awareness amongst the public and businesses**: Local authorities can play an important role in increasing awareness and preparedness of the public and businesses to climate impacts. This can include:
    - Advice on how individuals and businesses can prepare for transport disruptions (e.g., planning alternative routes, having emergency travel kits, considering flexible working arrangements).
    - Advice on preparing homes and business buildings for flooding and heat.
    - Advice on how to stay cool and guidance on food hygiene during heatwaves.
    - Information about measures to increase neighbourhood resilience (e.g. permeable surfaces, green and blue infrastructure) and the importance of adequate insurance.
    - Information on less familiar climate-related health risks, such as ticks and insect bites, including how to reduce exposure, recognise symptoms, and when to seek medical advice.
    - Advice on how to reduce water consumption.
- **Climate-resilient local authority financial planning and budgeting:** Local authorities must systematically integrate the cost of climate impacts and the costs of adaptation into their core financial management processes. This includes medium-term financial strategies, annual budget setting, capital investment programmes, and asset management plans. Local authorities should engage with their insurers to receive tailored advice and ensure that insurance policies provide adequate and cost-effective cover for climate-related risks to their diverse assets (buildings, infrastructure, vehicle fleets) and operations.

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Acronyms

Acronym	Full Name
ADEPT	Association of Directors of Environment, Economy, Planning & Transport
ARP	Adaptation Reporting Power
BE	Built Environment
BNG	Biodiversity Net Gain
CA	Combined Authority
CCC	Climate Change Committee
CCRA	Climate Change Risk Assessment
CIL	Community Infrastructure Levy
CJC	Corporate Joint Committee
COSLA	Convention of Scottish Local Authorities
DAERA	Department of Agriculture, Environment and Rural Affairs (Northern Ireland)
DfC	Department for Communities (Northern Ireland)
DfE	Department for the Economy (Northern Ireland)
DfI	Department for Infrastructure (Northern Ireland)
DfT	Department for Transport
DHSC	Department of Health and Social Care
DNO	Distribution Network Operator
DWI	Drinking Water Inspectorate
DWMP	Drainage and Wastewater Management Plan
DWQR	Drinking Water Quality Regulator for Scotland
EA	Environment Agency
EIP	Environmental Improvement Plan
FCERM	Flood and Coastal Erosion Risk Management
GB	Great Britain
GDN	Gas Distribution Network
GHG	Greenhouse Gas
GI	Green Infrastructure
GISI	Green Infrastructure Strategic Intervention
GLA	Greater London Authority
GPC	General Power of Competence
HIA	Health Impact Assessment
HSC	Health and Social Care
HSCP	Health and Social Care Partnership
ICB	Integrated Care Board
ICP	Integrated Care Partnership
ICS	Integrated Care System
IMD	Index of Multiple Deprivation
IPCC	Intergovernmental Panel on Climate Change
JSNA	Joint Strategic Needs Assessment
LA	Local Authority
LACS	Local Authority Climate Service
LCAT	Local Climate Adaptation Tool
LDP	Local Development Plan
LEP	Local Enterprise Partnership
LGA	Local Government Association
LGR	Local Government Reorganisation
LNRS	Local Nature Recovery Strategy
LOIP	Local Outcomes Improvement Plan

Acronym	Full Name
LRF	Local Resilience Forum
MMO	Marine Management Organisation
MPA	Marine Protected Area
MHCLG	Ministry of Housing, Communities and Local Government
NAO	National Audit Office
NAP	National Adaptation Programme
NBS	Nature-Based Solution
NESO	National Energy System Operator
NICCAP	Northern Ireland Climate Change Adaptation Programme
NICCF	Northern Ireland Civil Contingencies Framework
NIEA	Northern Ireland Environment Agency
NILGA	Northern Ireland Local Government Association
NPF4	National Planning Framework 4 (Scotland)
NPPF	National Planning Policy Framework
NRW	Natural Resources Wales
OHID	Office for Health Improvement and Disparities
PfACCW	Prosperity for All: A Climate Conscious Wales
PHA	Public Health Agency (Northern Ireland)
PHE	Public Health England
PHS	Public Health Scotland
PHW	Public Health Wales
PM2.5	Fine Particulate Matter
PPN	Procurement Policy Note
PPP	Public-Private Partnership
PPW	Planning Policy Wales
PSB	Public Service Board
PSCAN	Public Sector Climate Adaptation Network
RRP	Regional Resilience Partnership
RSF	Regional Strategic Framework
SAB	SuDS Approving Body
SEPA	Scottish Environment Protection Agency
SMNR	Sustainable Management of Natural Resources
SMP	Shoreline Management Plan
SNAP	Scottish National Adaptation Plan
SONI	System Operator for Northern Ireland
SPPS	Strategic Planning Policy Statement
SuDS	Sustainable Drainage Systems
TAN	Technical Advice Note
UAH	Ulster Architectural Heritage
UHI	Urban Heat Island
UKCIP	UK Climate Impacts Programme
UKHSA	UK Health Security Agency
WANE Act	Wildlife and Natural Environment Act (Northern Ireland)
WFG Act	Well-being of Future Generations (Wales) Act
WICS	Water Industry Commission for Scotland
WLGA	Welsh Local Government Association
WRMP	Water Resources Management Plan
YOT	Youth Offending Team

Chapter 1: Introduction

The United Kingdom's climate is changing. The country now faces warmer, wetter winters and hotter, drier summers, leading to increased flood risk, heat stress, and drought. With sea levels also rising, these changes present a significant and growing threat to the UK's infrastructure, economy, natural environment, and the well-being of its people[2] [3].

Recently, the primary focus of climate action in the UK has been on mitigation[4], the important work of reducing greenhouse gas (GHG) emissions to prevent the worst effects of climate change. While mitigation remains essential, it is now clear that we must also adapt to the impacts of today's extreme weather and increasing future risks. Planning for a changed climate is no longer a future concern; it is an urgent priority here and now.

While responding to climate is a key national challenge, and requires action from all sectors and all geographies, local authorities are fundamental to the UK's ability to build resilience. Due to their specific roles and knowledge, they are uniquely positioned to plan and put into place effective responses to these climate impacts.

Local authorities are essential for climate adaptation for several key reasons:

- **Management of services and infrastructure:** They run hundreds of essential local services, including public health, social care, schools, and transport. They also manage the local infrastructure that underpins them, such as roads, drainage systems, and public buildings, which are often directly exposed to hazards like flooding and extreme heat[5].
- **Emergency response and flood management:** Local authorities have some responsibilities for managing flooding (e.g. Lead Local Flood Authorities are responsible for managing risks from surface water and groundwater in England and Wales). They also play a critical role in civil contingencies, coordinating the immediate emergency response to extreme weather events like storms and heatwaves to keep communities safe and help them recover.
- **Protecting vulnerable people:** Climate change has a greater effect on some groups, such as older people, people on low incomes, or people with existing health conditions. Local authorities use their local knowledge and networks to

[2] The Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting
[3] Progress in adapting to climate change: 2025 report to Parliament - Climate Change Committee
[4] Adapting to climate change - The Institute for Government
[5] Accelerating adaptation action: Councils preparing for climate change | LGA

identify these residents and provide direct support, such as prioritising contact during floods or helping to cool homes during heatwaves[6].

- **Addressing inequality:** Climate impacts often fall hardest on those with the fewest resources and on marginalised communities. Local authorities play a key role in ensuring adaptation plans are fair, and that local investments are climate proofed, directing investment and support to disadvantaged communities to prevent existing inequalities from widening.
- **Local knowledge:** The risks from climate change vary significantly across the country. Coastal towns face different challenges to inland cities, just as areas with older populations require different support than younger demographics, and agricultural economies face distinct risks compared to urban business districts. Local authorities understand their area's specific geography, society, and economy, which is vital for designing tailored and effective solutions that work for that 'place'[7 8 9].
- **Shaping future resilience:** Through their planning functions, local authorities make decisions every day that affect long-term resilience. By ensuring new developments are built in the right way and in the right place, they can prevent future problems and avoid locking in designs that are not suited for a future climate. Acting now is far more cost-effective than reacting to climate impacts later[10].
- **Community leadership:** Local authorities are a vital link between national policy and the public. They can bring residents, businesses, and community groups together to build a shared understanding of climate risks and encourage the collective action needed to create a truly resilient society[11 12].

Progress on adaptation across the UK has not kept pace with escalating climate risks. This adaptation gap has been highlighted in successive progress reports from the Climate Change Committee (CCC)[13] and other research reports[4, 14, 5]. Local authorities, alongside other actors, play an important role in closing this gap.

1.1 What does this report cover?

This report explores the role of local authorities in adapting to climate change in the UK. It maps their current responsibilities against the practical actions needed, identifies the

[6] Community based climate change approaches
[7] Going down the local: the challenges of place-based net zero governance - Bedford et al 2023
[8] LSE PCAN Enabling Place-based Climate Action in the UK: The PCAN Experience
[9] Climate Resilience in Local Plans – Sandy Forsyth
[10] Adaptation and decarbonisation CCC 2023
[11] Climate action: place-based leadership and communication | LGA
[12] Understanding climate adaptation and the third National Adaptation Programme (NAP3)
[13] Progress reports (Adaptation) - Climate Change Committee
[14] Government resilience: extreme weather - NAO

key challenges they face, and proposes the changes required to help create a more effective local response.

It is structured to answer four key questions:

- **What is the current context?** Chapter 2 gives an overview of the UK's climate response framework and the existing roles and responsibilities of local authorities.
- **What are current drivers and barriers to local adaptation?** Chapter 3 provides an analysis of current drivers and the key barriers facing local authorities, such as funding, capacity, and policy gaps.
- **What actions can local authorities take?** Chapter 4 takes a look at specific areas, such as transport, health, and land, and the practical steps local authorities can take to adapt effectively.

This report was finalised ahead of the publication of the CCC's 2026 advice on adaptation, therefore some system descriptions and some of the assessments in relation to system resilience may differ slightly from the current CCC advice. Detailed descriptions of the different adaptation systems can be found in the Well-Adapted UK report.

1.2 How to read this report

You do not need to read this report from start to finish. Different sections may be useful for different readers:

- **For understanding the wider UK adaptation context:** If you want to understand the wider regulatory, institutional and legal context that local authority adaptation action is situated in, see Chapter 2.
- **For barriers to progress:** If you want to understand why progress has been slow and what the main obstacles for local authorities are, see Chapter 3.
- **For sector-specific actions:** If you are looking for practical steps for specific areas, such as Transport, Health, or Land, you can go straight to the relevant section in Chapter 4.

Chapter 2: What is the current context?

This chapter explores the UK's current systems and processes for climate adaptation, and the role local authorities play. It summarises essential processes such as the Climate Change Risk Assessments (CCRAs), National Adaptation Programmes (NAPs), and the UK Climate Change Committee's monitoring framework, which collectively guide the nation's response. It also outlines the roles and responsibilities of local authorities (in collaboration with regional governance structures) in contributing to effective climate adaptation in the UK.

Policy, legislation, and regulations are evolving rapidly across the UK. The content of this report reflects the position at the time of writing in early 2026, but some policies and programmes may change.

2.1 How are we coordinating climate adaptation in the UK?

Under the 2008 Climate Change Act[15], the UK Government must publish a Climate Change Risk Assessment (CCRA) every five years. Every CCRA provides an up-to-date summary of the scientific evidence and understanding of the specific climate change risks and opportunities the UK faces. The Climate Change Act 2008 and national equivalents also require that each nation within the UK has a National Adaptation Programme (NAP) that sets out their government's plans and actions to address the risks and opportunities identified in the CCRA. While the 2008 Act sets the overarching UK framework, Scotland, Wales and Northern Ireland have also established their own specific climate change acts with distinct targets and duties.

The Climate Change Committee (CCC)[16], an independent body established by the 2008 Act, has a statutory role to provide independent advice on climate change risk to government for the CCRA. The CCC publishes its independent climate change risk assessment (CCRA4-IA) evidence and advice in 2026, which will feed into the forthcoming government fourth assessment (CCRA4), due to be laid before Parliament in 2027.

The CCC also has a statutory role to report to Parliament every two years on the UK's progress on adapting to the risks identified in the CCRA. These are known as progress reports[13], the most recent (as of February 2026) was published in May 2025[17]. The CCRA, NAPs and the CCC's statutory role help to provide a regular policy cycle for tracking climate risks and opportunities, setting out adaptation plans and actions and monitoring adaptation progress across all nations in the UK.

[15] Climate Change Act 2008
[16] Climate Change Committee
[17] Progress in adapting to climate change: 2025 report to Parliament - Climate Change Committee

2.1.1 What is in the CCRA?

The CCRA framework provides a scientifically credible, nationally recognised evidence base for adaptation. Adopting this common framework enables local authorities to identify and articulate their specific local risks in a consistent manner, facilitating comparison and collaboration across the UK.

However, national risks must be translated into place-based action. While the CCRA identifies broad trends (such as coastal erosion or agricultural shifts) local authorities have the detailed local knowledge and statutory levers (planning, housing, infrastructure) and contacts, networks and partnerships required to respond.

To be effective, local authorities should therefore systematically map their local vulnerabilities against the CCRA framework. This ensures local plans are grounded in national evidence while addressing specific community needs. Additional area- specific vulnerabilities or opportunities can be added to the framework if required.

To support this alignment, the fourth round of the Adaptation Reporting Power (ARP4) includes a pilot, inviting local authorities to report on adaptation planning and activities on a voluntary basis. This initiative encourages councils to assess their climate risks against the national framework, helping to bridge the gap between national strategy and local delivery.

2.1.2 What are the NAPs?

In response to the risks identified in the CCRA, the Climate Change Act 2008 and national equivalent acts mandate the UK Government, the Scottish Government, the Welsh Government and the Northern Ireland Executive to publish plans outlining how they will adapt to these risks. While the CCRA provides a UK-wide evidence base, the responsibility for developing specific adaptation strategies and actions is primarily a devolved policy area. This means that Scotland, Wales, and Northern Ireland each have the authority to develop and put into place their own adaptation plans, tailored to their specific circumstances, priorities, and legislative contexts. The current adaptation plans across the UK are summarised in *Table 1*.

Table 1: Summary of National Adaptation Plan (NAPs) in the UK

Nation	NAP
England	The third National Adaptation Programme (NAP3)[18] was published in July 2023. It sets out the UK Government's plan for England over five years, outlining objectives, policies, and proposals to address the priority climate change risks identified in CCRA3[19].
Scotland	The third Scottish National Adaptation Plan (SNAP3)[20] was published in September 2024. Climate Ready Scotland: climate change adaptation programme 2024-2029, details how Scotland aims to build resilience to

[18] Third National Adaptation Programme (NAP3)
[19] Technical report (CCRA3-IA) - UK Climate Risk
[20] Climate change: Scottish National Adaptation Plan 2024-2029

Nation	NAP
	the impacts of climate change across society, the economy, and the environment.
Wales	The Climate Adaptation Strategy for Wales 2024[21] sets out the Welsh Government's approach and actions for the current adaptation cycle, responding to the risks identified in CCRA3.
Northern Ireland	The third Northern Ireland Climate Change Adaptation Programme (NICCAP3) has been published in March 2026 and covers the period until 2029, setting out the strategic direction for adapting to climate change within the region[22].

These national programmes establish the strategic direction and priorities for adaptation within each respective nation. They form the policy context within which local authorities operate, guiding their efforts to translate the risks identified in the CCRA into tangible actions appropriate for their specific areas.

2.1.3 What is the CCC Adaptation Monitoring Framework?

The CCC has a statutory duty under the Climate Change Act 2008 to independently assess and report on the UK's progress in adapting to the impacts of climate change. To carry out this role consistently and systematically across the whole country, the CCC uses an Adaptation Monitoring Framework, which is being updated for the CCRA4-IA[23]. This framework provides a structured approach for the CCC to evaluate how effectively adaptation measures are being planned and put into place across all nations of the UK and track progress in adaptation.

The evidence gathered and assessed using this framework directly informs the CCC's regular statutory progress reports on adaptation. These reports, submitted to the UK Parliament and national governments, provide an independent evaluation of national adaptation efforts and often include recommendations for further action needed to improve the UK's climate resilience. The CCC organises its reporting around 14 systems. These systems cover the range of risks and opportunities identified in the CCRA4-IA Technical report (*Table 2*).

Table 2: CCC systems and corresponding risks

System	Risks and opportunities
Health	H1: Risks to people from heat H2: Risks to people from extreme weather, excluding heat H3: Risks to people from changes in air quality H4: Risks to people from climate sensitive diseases H5: Risks to food safety and nutrition H6: Risks to health and social care delivery

[21] Climate Adaptation Strategy for Wales 2024
[22] The third Northern Ireland Climate Change Adaptation Programme (NICCAP3) | Department of Agriculture, Environment and Rural Affairs
[23] Climate Change Risk Assessment Independent Assessment (CCRA4-IA) Technical Report - Met Office

System	Risks and opportunities
Built environment and communities	BE1: Risks to buildings and communities from heat BE2: Risks to buildings and communities from flooding BE3: Risks to buildings and communities from coastal change BE4: Risks to buildings and communities, excluding from heat, flooding and coastal change BE5: Risks to indoor environmental quality BE9: Risks to households from changing energy demand
Public services	BE7: Risks to facilities delivering public services, excluding health and social care BE8: Risks to local resilience planning and emergency service response capabilities
Cultural heritage	BE6: Risks to cultural heritage and landscapes
Water and wastewater	I1: Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems I9: Risks to water supply and wastewater systems
Waste	I1: Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems I10: Risks to waste management systems, excluding wastewater systems
Digital and telecoms	I1: Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems I8: Risks to digital and communications systems
Transport	I1: Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems I5: Risks to road transport systems I6: Risks to rail transport systems I7: Risks to aviation, shipping and other transport systems
Energy	I1: Risks to the delivery of infrastructure services from interdependencies with other infrastructure systems I2: Risks to electricity generation assets I3: Risks to electricity transmission and distribution I4: Risks to fuel supply systems
Land	N1: Risks to terrestrial and coastal ecosystems N2: Risks to freshwater ecosystems N4: Risks to soil ecosystems N5: Risks to natural carbon stores and sequestration N6: Risks to agriculture N8: Risks to forestry N9: Opportunities for agriculture, fisheries, aquaculture and forestry
Sea	N3: Risks to marine ecosystems N5: Risks to natural carbon stores and sequestration N7: Risks to fisheries and aquaculture

System	Risks and opportunities
	N9: Opportunities for agriculture, fisheries, aquaculture and forestry
Food security	N10: Risks to food security
Economy and finance	E1: Risks to UK macroeconomic performance and stability E2: Risks to domestic and overseas physical assets of UK businesses E3: Risks to domestic and international supply chains and resource inputs of UK businesses E4: Risks to Productivity and Availability of Labour in the UK E5: Risks to financial institutions and the financial system E6: Risks to public finances E7: Risks to household finances E8: Opportunities to UK businesses and financial institutions from delivering adaptation goods and services
National security and international engagement	*International risks are spread across the CCRA4-IA technical report.*

2.2 How does national, regional & local governance fit together in the UK?

While the national frameworks provided by the CCRA, NAPs, and the CCC's monitoring framework set the overall direction for climate adaptation in the UK, translating these high-level plans and assessments into effective, place-based action depends on the roles and responsibilities within the UK's multi-level governance system. This section explores the different components of local governance in the UK and how it fits together, with a particular focus on roles and responsibilities related to climate adaptation.

2.2.1 How are local authorities structured in different UK nations?

The structure of local government varies significantly across the four nations of the UK, impacting how responsibilities, including those relevant to climate adaptation, are distributed and coordinated.

2.2.1.1 England

England has the most complex and varied local government structure[24].

- **Two-tier areas:** Many parts of England operate a two-tier system comprising County Councils and District (or Borough/City) Councils. County Councils typically handle strategic services covering the entire county, such as education, adult

[24] Local government in England: Structures

social care, transport planning, highways, waste disposal, strategic land-use planning, minerals and waste planning, emergency planning, public health, and libraries. District Councils deliver more local services, including housing, local planning, building control, waste and recycling collection, environmental health, and leisure facilities. This division of responsibilities requires coordination between tiers for effective adaptation, particularly where strategic planning (county) needs to align with local planning and implementation (district)[25].

- **Unitary Authorities:** In other areas in England, a single Unitary Authority is responsible for all local government services, combining the functions of county and district councils. This includes 36 Metropolitan District Councils covering large urban areas (primarily in the North and Midlands), 32 London Boroughs, and numerous other unitary authorities covering specific counties (e.g., Cornwall), cities (e.g., Nottingham), or large towns[26]. Devolution means more two-tier authorities are becoming unitaries.
- **Greater London Authority (GLA):** The GLA is a unique strategic authority for London, comprising a directly elected Mayor and Assembly, with responsibilities for transport (Transport for London), policing, fire and rescue, strategic planning (the London Plan), and housing. It operates alongside the 32 London Boroughs[26].
- **Combined Authorities (CAs):** CAs are groups of two or more councils that collaborate on strategic functions, particularly economic development, strategic planning, skills, and transport. Many CAs have directly elected mayors and receive devolved powers and funding from central government[25]. Their regional scope makes them potential vehicles for strategic adaptation planning, although this role is still evolving. Combined Authorities and Combined County Authorities will be known as Strategic Authorities under the English Devolution and Community Empowerment Bill[27].
- **Parish and Town Councils:** These are the most local tier of local governance, with 10,000 existing in some parts of England but not others. They have limited powers, typically focused on local amenities (parks, community halls, allotments and community buses), and act as statutory consultees on planning applications within their area[25]. They operate under a principal authority (a district council in two-tier areas or a unitary authority in single-tier areas).
- **Local Government Association (LGA):** The LGA is the national membership body for local authorities in England and Wales (via the Welsh Local Government Association). This voluntary association aims to support, promote, and improve local government. It plays an important role in engaging with government, for

[25] How is local government organised? | LGA
[26] What are the different types of local government in England? – Electoral Reform Society
[27] English Devolution and Community Empowerment Act 2026 - Parliamentary Bills - UK Parliament

example, co-chairing the Local Net Zero Delivery Group with the government minister.

2.2.1.2 Scotland

Scotland employs a uniform, single-tier structure across the country.

- **Unitary Councils:** There are 32 unitary councils[28], each responsible for the full range of local government services within its geographical area, including education, social care, waste management, planning, roads, environmental protection, and libraries[29]. These unitary councils operate independently of the Scottish Government and are accountable to their local electorates. Despite identical functions and powers, they vary considerably in geographical size and population density[30].
- **Community Councils:** Approximately 1,200 community councils operate below the unitary authorities. Composed of elected local volunteers, they act as a representative voice for their communities and have a statutory right to be consulted on local planning applications, bridging the gap between the local authority and residents[31].
- **COSLA (Convention of Scottish Local Authorities):** The representative body for all 32 Scottish councils, engaging with the Scottish Government and other national bodies[32].

2.2.1.3 Wales

Wales primarily operates a unitary system, supplemented by statutory regional bodies and community councils.

- **Principal Councils:** There are 22 unitary principal councils responsible for delivering the full range of local government services, including education, social work, environmental protection, most highway maintenance, planning, and housing[33].
- **Community and Town Councils:** Similar in function to English parish councils, these exist in most, but not all, communities. They manage local amenities and are consulted on planning matters[34].
- **Corporate Joint Committees (CJCs):** Four statutory regional bodies established under the Local. Government and Elections (Wales) Act 2021[35], covering North, Mid, South West, and South East Wales. They comprise representatives from the

[28] Councils | COSLA
[29] Scottish Local Authority
[30] Demographic Change in Scotland
[31] Local government facts and figures: Scotland - LGiU
[32] COSLA | COSLA
[33] Councils and Councillors - An Introduction - WLGA
[34] Town and Community Councils - WLGA
[35] Local Government and Elections (Wales) Act 2021

principal councils within their region and hold powers relating to regional economic well-being, strategic development planning, and regional transport planning. These offer a formal structure for regional-scale collaboration, potentially including an adaptation strategy[36].

- **Public Service Boards (PSBs):** Mandated by the Well-being of Future Generations (Wales) Act 2015[37], a PSB exists for each principal council area (though some have merged). PSBs bring together key public bodies (such as the local authority, the local health board, Natural Resources Wales, and the fire and rescue authority) with the primary purpose of improving collaboration to enhance the well-being of the area[38]. They assess local well-being, set local objectives aligned with national well-being goals (including resilience), and publish local well-being plans. This structure provides a mechanism for integrating climate adaptation into broader well-being and service delivery planning at a local level.
- **WLGA (Welsh Local Government Association):** The representative body for the 22 principal councils in Wales[39]. Like the LGA and COSLA, membership is voluntary, though currently all 22 councils are members.

2.2.1.4 Northern Ireland

Northern Ireland has a single tier of local government with a more limited range of functions compared to Great Britain (GB) nations.

- **District Councils:** There are 11 district councils in Northern Ireland[40]. Their responsibilities primarily cover operational services such as waste collection and disposal, recycling, leisure and recreation services, building control, local planning functions (including Local Development Plans and development management), environmental health, and community planning[41]. However, major services like education, strategic planning, roads and transport, housing strategy and provision (largely via the NI Housing Executive), and health and social care are delivered by central Northern Ireland Government Departments and associated bodies, not councils[42].
- **No lower tier:** There are no parish or community councils in Northern Ireland.
- **NILGA (Northern Ireland Local Government Association):** The representative body for the 11 district councils[43].

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[36] Corporate Joint Committees: Statutory Guidance
[37] Well-being of Future Generations (Wales) Act 2015
[38] Public Services Boards - Future Generations Wales
[39] Cymdeithas Llywodraeth Leol Cymru | Welsh Local Government Association
[40] Overview of government in Northern Ireland
[41] Climate Action Plan Northern Ireland Councils 2020
[42] Local government facts and figures: Northern Ireland
[43] Home | NILGA

Regional collaboration mechanisms also differ between nations:

- Wales's statutory regional bodies (Corporate Joint Committees and Public Service Boards) are designed to foster cross-boundary collaboration on strategic planning, economic development, transport, and public service integration[44]. These provide formal platforms for addressing adaptation challenges that transcend individual local authority boundaries, such as river catchment management, coastal resilience, or regional infrastructure planning.
- England's Combined Authorities offer a similar coordination potential and several have started successful adaptation partnership working across local authority boundaries under this model[25].
- Scotland relies more on voluntary partnerships and networks supported by national bodies like the Scottish Environment Protection Agency (SEPA) and Adaptation Scotland[45].
- Northern Ireland utilises Community Planning Partnerships (CPPs)[46], statutory partnerships that bring together key public service providers to develop long-term plans for local well-being, offering a platform to integrate climate adaptation across services.

The following table summarises the key structural features across the four nations:

Table 3: Summary of local government structures and tiers across UK nations

Feature	England	Scotland	Wales	Northern Ireland
Primary structure type(s)	Mixed Two-Tier (County/District), Unitary (Metropolitan Districts, London Boroughs, other Unitaries)	Unitary	Unitary	Unitary
Key tiers / bodies	**Two-Tier System:** County Councils (21) District, Borough, or City Councils (164) **Single-Tier System:**	**Unitary System:** 32 Unitary Councils	**Unitary System:** 22 Principal Councils **Regional / Collaborative:** 4 Corporate Joint	**Unitary System:** 11 District Councils **Central Government:** NI Government Departments

[44] Local democracy in Wales: introduction to local government
[45] Regional Partnerships - Adaptation Scotland
[46] Community Planning | Department for Communities

Feature	England	Scotland	Wales	Northern Ireland
	Unitary Authorities (including 32 London Boroughs & 36 Metropolitan Districts) **Strategic / Regional:** Greater London Authority (GLA) Combined Authorities (CAs) **Local:** Parish and Town Councils (10,000, variable coverage)	**Local:** Community Councils (c.1200)	Committees (CJCs) Public Service Boards (PSBs) **Local:** Community and Town Councils (variable)	(deliver many key services) **Local:** None (no parish or community councils)
General remit relevant to adaptation	Two-Tier: Strategic (County - transport, waste disposal, strategic planning, emergency planning, public health) vs. Local (District - housing, local planning, waste collection, env. health). Unitary: All functions combined	All local services (education, social care, planning, roads, waste, env. protection, etc.).	All local services, plus regional collaboration via CJCs (strategic planning, transport, economy) and PSBs (well-being integration, cross-service collaboration).	More limited range: Waste, leisure, local planning, building control, env. health, community planning, and local economic development. Strategic planning, roads, housing, and social care are largely handled by NI Depts.
Representative body[47]	Local Government Association (LGA)	Convention of Scottish LAs (COSLA)	Welsh Local Government Association (WLGA)	Northern Ireland Local Government Association (NILGA)

[47]Other membership bodies also play a vital role in coordinating local authority views and supporting local authorities (including on aspects of adaptation).

2.2.2 What is the role of central UK and National Government?

While local authorities deliver adaptation policies and measures in local places, they operate within a framework set by central Government. Key departments play a decisive role in enabling (or constraining) local action through legislation, policy, and funding.

- **Setting direction and regulation:** Central UK and national governments set national policy frameworks (e.g., National Planning Policy Framework (NPPF)[48] and National Planning Practice Guidance (NPPG) in England, National Planning Framework 4 (NPF4)[49] in Scotland, Planning Policy Wales (PPW)[50] in Wales), statutory duties, environmental regulations. Local authorities must have regard to national planning frameworks and guidance when setting Local Plans and take them into consideration in the planning balance when determining planning applications, alongside their Local Plans and locally developed plans and policies. Separately, building standards are a standard set nationally that local authorities must adhere to and enforce outside of planning, through their building regulations officers.
- **Sector leadership:** Specific departments drive adaptation in their sectors. Defra leads on overall adaptation policy and flood funding; the Department for Transport (DfT) sets standards for road and rail resilience; and the Department of Health and Social Care (DHSC) guides the health system's response to risks like heatwaves and diseases.
- **Funding:** Central government provides the bulk of local authority funding, often via competitive grants or ring-fenced pots for specific national priorities. This means local authorities often act as delivery agents for national policies, with their ability to act locally heavily dependent on the resources and strategic direction provided by Whitehall and the Devolved Administrations.

2.2.3 How do regional organisations fit into the adaptation picture?

Local authorities do not operate in isolation when addressing climate adaptation. They interact with, rely on, and are sometimes directed by a range of national and regional bodies with specific environmental, health, infrastructure, and regulatory functions. The nature and effectiveness of these interactions are critical determinants of local adaptation capacity.

[48] National Planning Policy Framework
[49] Part 2 – National Planning Policy - National Planning Framework 4
[50] Planning Policy Wales - Edition 12

2.2.3.1 Environmental regulators and agencies

These bodies are key players in providing data, expertise, strategic direction, and sometimes funding related to environmental aspects of adaptation, particularly water management and biodiversity (see *Table 4*).

Table 4: Environmental regulators and agencies across different nations in the UK

Nation	Bodies
England	The **Environment Agency (EA)**, an executive non-departmental public body sponsored by Defra[51], holds significant responsibilities for flood and coastal erosion risk management (FCERM), water resources management, and broader environmental protection. It acts as a strategic overview authority for flood risk from main rivers, the sea, and reservoirs[52]. Under the Flood and Water Management Act 2010 and associated Flood Risk Regulations, the EA works with Lead Local Flood Authorities and other risk management authorities to support the preparation and delivery of local flood risk management strategies and Flood Risk Management Plans. The EA supports local authorities by providing climate projections (UKCP data access), flood risk mapping, technical guidance (e.g., climate change allowances for flood risk assessments used in planning[53]), and flood warnings[52]. It also works in partnership with local authorities during flood events as a Category 1 responder and provides guidance to support the recovery phase.
Scotland	The **Scottish Environment Protection Agency (SEPA)** is Scotland's principal environmental regulator and also the national flood forecasting, flood warning, and strategic flood risk management authority[54]. SEPA produces national flood hazard and risk maps[55], provides flood warnings, and works closely with local authorities, which are responsible for producing Local Flood Risk Management Plans under the Flood Risk Management (Scotland) Act 2009[56].
Wales	**Natural Resources Wales (NRW)** is a Welsh Government sponsored body with the purpose of the sustainable management of natural resources (SMNR)[57]. NRW's remit covers flood risk management, water resources, land management (including the Welsh Government woodland estate), biodiversity conservation, and environmental regulation[58]. NRW works collaboratively with local authorities and other partners through mechanisms like statutory Area Statements (which identify local SMNR priorities, risks, and opportunities,

[51] Living better with a changing climate
[52] Adapting to a changing climate: The Environment Agency's second adaptation report under the Climate Change Act
[53] Environment Agency and climate change adaptation
[54] Flood Warning Development Framework | SEPA
[55] Flood maps | Beta | SEPA | SEPA
[56] Flood Risk Management (Scotland) Act 2009
[57] Natural Resources Wales
[58] Natural Resources Wales / Our work on climate change

Nation	Bodies
	including climate adaptation[59]) and Public Service Boards. It provides evidence and data to support local planning and decision-making[60].
Northern Ireland	The **Northern Ireland Environment Agency (NIEA)[61]** is an agency within the Department of Agriculture, Environment and Rural Affairs (DAERA). Its role is focused on environmental regulation (pollution control, waste management, water quality) and providing statutory advice on planning applications concerning the natural environment. Unlike its GB counterparts, its direct operational role in flood risk management (which sits with the Department for Infrastructure - Rivers) or proactive adaptation support is less prominent. DAERA leads on climate change policy coordination and NICCAP development. The DAERA-funded network, Climate Northern Ireland[62], plays a significant role in providing adaptation information, support, and facilitating collaboration for LAs and other sectors.

2.2.3.2 Public health bodies

These organisations play a vital role in assessing and communicating the health risks associated with climate change (e.g., heat stress, vector-borne diseases, mental health impacts of flooding) and supporting the resilience of health and social care systems, often working closely with local authorities which hold statutory public health and social care responsibilities (see *Table 5*).

Table 5: Public health bodies across different nations in the UK

Nation	Bodies
England	The **UK Health Security Agency (UKHSA)** leads on health protection, including emergency preparedness for extreme weather events. It manages the national Adverse Weather and Health Plan[63] and associated alerting systems[64]. UKHSA works with Department of Health and Social Care (DHSC), NHS England, and local partners, including local authority Directors of Public Health, to build health system resilience and provide guidance[64]. The Office for Health Improvement and Disparities (OHID) also plays a role in addressing underlying health inequalities relevant to climate vulnerability[65].
Scotland	**Public Health Scotland (PHS)** works to protect and improve population health. It collaborates with NHS Scotland, local authorities (often through Health and Social Care Partnerships)[66], and others. PHS contributes to national guidance, such as the Ready Scotland advice

[59] Natural Resources Wales / Climate and environment emergency – adaptation and mitigation
[60] Natural Resources Wales / Connecting people with nature
[61] Northern Ireland Environment Agency | DAERA
[62] Climate Northern Ireland | Awareness of the NI Climate Challenge
[63] Adverse Weather and Health Plan
[64] NHS England » 4th Health and climate adaptation report
[65] Office for Health Improvement and Disparities
[66] People supported through Social Care Services - Public Health Scotland

Nation	Bodies
	for emergencies, and researches climate-related health impacts, such as the benefits of green space.
Wales	**Public Health Wales (PHW)** is proactive in climate adaptation. It has produced a comprehensive Health Impact Assessment (HIA) of climate change in Wales[67] and developed a specific Health and Social Care Climate Adaptation Toolkit designed for use by health organisations and LAs[68]. PHW operates within the Well-being of Future Generations (Wales) (WFG) Act framework and supports Public Service Boards.
Northern Ireland	**The Public Health Agency (PHA)** has statutory responsibility for health protection, including emergency preparedness and response[69]. It works with Health and Social Care (HSC) Trusts and other multi-agency partners in the civil contingencies framework. While it provides public advice during weather emergencies and focuses on health improvement and inequalities[70], its specific focus on proactive climate adaptation planning appears less developed in available documentation compared to PHW or UKHSA.

2.2.3.3 Transport authorities

National and regional transport bodies responsible for strategic networks (motorways, major A roads, rail) interact with local authorities regarding planning, local network integration, recovery work and resilience (see *Table 6*).

Table 6: Transport authorities across different nations in the UK

Nation	Bodies
England	**National Highways**[71], **Network Rail**, and major port/airport operators are key infrastructure providers, many subject to the Adaptation Reporting Power (ARP)[72]. They engage with local authorities as planning consultees regarding impacts on local road networks and may collaborate with local authorities on adaptation measures (e.g. managing cross-network drainage or heat resilient verges) and extreme weather incident responses.
Scotland	**Transport Scotland**, the national agency, works with local authorities and Regional Transport Partnerships on strategic planning and investment, including adaptation considerations within SNAP3.

[67] Health and social care climate emergency national programme
[68] Health and social care climate adaptation toolkit
[69] Emergency preparedness and environmental hazards | HSC Public Health Agency
[70] PHA Corporate Plan 2025 2030
[71] National Highways is responsible for maintaining and improving the Strategic Road Network (motorways and major A-roads), while Local Authorities are responsible for the Local Road Network (all other roads)
[72] Understanding climate risks to UK infrastructure Evaluation of the third round of the Adaptation Reporting Power - 2022

Nation	Bodies
Wales	The Welsh Government's transport division oversees national policy. The four Corporate Joint Committees have statutory responsibility for developing Regional Transport Plans, requiring collaboration between local authorities in each region[73]. Local authorities also act as agents for trunk road management.
Northern Ireland	The **Department for Infrastructure** (DfI) is responsible for the road network and strategic transport policy. Councils interact primarily through the planning process and local traffic management.

2.2.3.4 Water and energy utility providers

Local authorities must coordinate closely with utility providers to ensure that essential services (water supply, wastewater treatment, and energy) are resilient to climate impacts. These interactions are critical for local planning, flood risk management, and emergency response.

Table 7: Water and Energy Bodies across different nations in the UK

Sector	Bodies and Local Authorities Interaction
Water	Water Companies and Water and Sewerage Companies (WaSCs) (private in England/Wales, public 'Scottish Water' in Scotland, government-owned 'NI Water' in Northern Ireland) are responsible for supply and drainage. They are statutory consultees in the Local Plan process, advising local authorities on infrastructure capacity. Crucially, they work with local authorities to manage flood risk from sewers and surface water. Regulators like Ofwat (England/Wales) and the Water Industry Commission for Scotland set the investment frameworks that determine how much funding is available for adaptation measures.
Energy	Distribution Network Operators (DNOs) manage the local electricity distribution system (e.g. lines, cables, poles, towers and primary and secondary substations), while Gas Distribution Networks (GDNs) manage gas main and pipes and district gas governors (that manage gas pressure in the local network). Local authorities interact primarily with these regional operators regarding the resilience of local infrastructure to floods, storms and heat, and to plan grid capacity for new developments. Electricity and gas Transmission Operators own and maintain the high-voltage electricity and high-pressure gas transmission networks that transport energy over long distances and connect generation and supply sources to regional distribution networks, interfacing with DNOs and GDNs at grid supply and offtake points. In Great Britain, the National Energy System Operator (NESO) plans and operates the electricity network. While NESO's interaction is often at a national level, their strategic planning for resilience increasingly requires coordination with regional and local energy planning with input from local authorities. In

[73] Llwybr Newydd: the Wales transport strategy 2021

Sector	Bodies and Local Authorities Interaction
	Northern Ireland, the System Operator for Northern Ireland (SONI) plans and operates the electricity transmission system.

Local authorities may be dependent on these larger bodies for the specialised data, technical expertise, and strategic guidance needed to underpin effective adaptation planning, particularly in complex areas like flood risk modelling, coastal change, and public health impact assessment. The capacity of local authorities to act can therefore be directly influenced by the quality, accessibility, and timeliness of the support provided by these agencies. Furthermore, the sheer number of agencies involved across different sectors (environment, health, transport, energy, water) creates a complex governance landscape for local authorities to navigate, and the number of local authorities within regional or national agency geographies gives them a challenging in engaging and supporting each local authority effectively. Achieving integrated, holistic local adaptation strategies requires significant effort from local authorities to coordinate with multiple partners, manage potentially overlapping remits, and reconcile differing priorities or guidance. The mechanisms for coordinating action (both between neighbouring local authorities and between local authorities and national bodies) differ across the UK. Wales uses statutory Public Service Boards to mandate collaboration between councils and key bodies like Natural Resources Wales. England relies more on partnership frameworks, such as Local Resilience Forums (which include the Environment Agency), and the statutory planning system set by Central Government, and the convening powers of Combined Authorities. Scotland uses statutory duties that compel all public bodies, including regulators, to work together. Northern Ireland uses the Regional Community Resilience Group and local community resilience groups[74]. These forums bring together government, utilities, and voluntary partners to prepare for emergencies. The different national models affect how effectively Central Government policy is translated into local delivery and likely result in variations in the consistency of adaptation planning.

2.3 What are local authorities' powers and duties for adapting to climate change?

Given the key role of local authorities within the UK's governance structure, as outlined in the previous section, it is important to understand the specific legal roles and responsibilities they hold in adapting to climate change. These duties and powers provide the framework that allows, and sometimes requires, local authorities to plan for and respond to the impacts of climate change within their communities and across their areas.

[74] Regional Community Resilience Group | Department for Infrastructure

2.3.1 What are the adaptation duties and powers for local authorities in different nations?

Local authorities across the UK have a range of statutory duties and powers that enable them to influence and implement climate change adaptation measures. However, the specific legal frameworks, the strength of mandates, and the scope of powers vary significantly between the four nations.

A detailed report outlining the Duties and Powers of Local Authorities for Climate Change Adaptation has been developed as a separate resource to this report[75]. The section below provides a summary of this more detailed report.

2.3.1.1 England

A summary of the duties and powers of Local Government in England to adapt to climate change is provided in Table 8.

Table 8: Summary of local authority climate adaptation duties and powers in England

Type	Enabler	Scope	Description
Duty	Planning and Compulsory Purchase Act 2004	England and Wales	Local plan-making must include policies designed to ensure that the development and use of land contribute to climate change adaptation. Every local development plan must contain policies addressing climate adaptation.
Duty	Town and Country Planning Act 1990 (via National Planning Policy Framework)	England	Local planning authorities must consider material considerations like flood risk and coastal change in development control. Planning decisions must align with plan policies and have regard to national policies on climate resilience.
Duty	Flood and Water Management Act 2010	England and Wales	Lead Local Flood Authorities (LLFAs) must develop, maintain, apply, and monitor a Local Flood Risk Management Strategy. LLFAs must investigate significant flood incidents and publish reports. LLFAs must establish and maintain a public register of structures or features that significantly affect flood risk. Flood risk management authorities must aim to contribute to sustainable development.
Duty	Environment Act 2021 (amending Natural Environment	England	Public authorities must consider action to further the "general biodiversity objective," integrating biodiversity into service delivery. Local Authorities must report on actions taken to comply with this duty.

[75] Duties and powers of local authorities in the UK to adapt to climate change

Type	Enabler	Scope	Description
	and Rural Communities Act 2006)		
Duty	Environment Act 2021	England	Mandates the creation of Local Nature Recovery Strategies (LNRS) to identify priorities and map proposals for nature's recovery. Responsible authorities lead the preparation of these strategies and report on their delivery every five years.
Duty	Environment Act 2021	England	Introduces a mandatory Biodiversity Net Gain (BNG) requirement (at least 10%) for developments under the Town and Country Planning Act 1990.
Duty	Environment Act 2021	England	Local authorities are required to take measures to reduce fine particulate matter (PM2.5). District councils are responsible for local Air Quality Action Plans.
Duty	Civil Contingencies Act 2004	UK-wide	Category 1 responders (including local authorities) must assess the risk of emergencies (including natural hazards like flooding, drought, storms, heatwaves) and maintain up-to-date emergency plans. Councils must regularly produce Community Risk Registers and prepare contingency plans.
Duty	Highways Act 1980	England and Wales	Local highways authorities must maintain roads in a safe and usable condition for ordinary traffic.
Power	Town and Country Planning Act 1990	England and Wales	Local authorities can: • Attach planning conditions or obligations requiring climate resilience measures (e.g., SuDS, green roofs). • Negotiate Section 106 agreements for developer contributions to adaptation projects. • Designate Conservation Areas or Tree Preservation Orders. • Refuse proposals which are unsafe or exacerbating climate risks.
Power	Flood and Water Management Act 2010	England and Wales	Grants powers to Lead Local Flood Authorities (LLFAs) and other Risk Management Authorities (RMAs) to designate structures affecting flood risk and to consent to or carry out works on ordinary watercourses. Local

Type	Enabler	Scope	Description
			authorities can proactively create flood storage ponds or install SuDS on their land.
Power	Land Drainage Act 1991	England and Wales	District councils and internal drainage boards have permissive powers to maintain watercourses and mitigate flooding.
Power	Coast Protection Act 1949	Great Britain	Maritime district councils as designated as Coast Protection Authorities have powers to carry out coastal protection works to prevent erosion by the sea, relevant for sea-level rise and coastal erosion adaptation.
Power	Environmental Protection Act 1990	Great Britain	Councils can deal with statutory nuisances, which can include issues exacerbated by climate change.
Power	Countryside Act 1968	England and Wales	Councils can manage country parks and public rights of way, which can be used to enhance resilience (e.g. shading routes, improving upland catchments).
Power	Localism Act 2011	England	General Power of Competence (GPC) allows principal local authorities to do anything that individuals generally may do, unless specifically prohibited by law, enabling them to undertake climate adaptation initiatives.
Power	Local Government Act 1972	England and Wales	Councils without GPC (e.g. town and parish councils) may incur expenditure for the benefit of their area or residents up to a financial limit, supporting small-scale adaptation.
Power	Housing Act 2004 (Housing Health and Safety Rating System)	England	Councils can enforce remedies for health hazards exacerbated by climate change in dwellings, including excess cold or heat, requiring improvements like insulation or ventilation.
Power	Public Health (Control of Disease) Act 1984	England and Wales	Gives councils certain powers in health protection, e.g. setting up emergency shelters or closing premises in extreme events.
Power	Procurement Act 2023	England, Wales, and Northern Ireland	Local authorities can embed climate adaptation criteria into procurement processes, influencing supply chains and encouraging resilient products/services, supported by an emphasis on public benefit and social value.

England has no overarching statutory duty, compelling local authorities to integrate climate adaptation across all their functions in the way seen in Scotland or Wales. Duties are primarily tied to specific service areas like planning, emergency response,

and flood management. The two-tier structure also means responsibilities are split, requiring coordination.

Text Box 1: Environmental Targets (Public Authorities) Bill

Environmental Targets (Public Authorities) Bill[76]

The Environmental Targets (Public Authorities) Bill, a Private Members' Bill introduced in the House of Lords in September 2024, aims to impose a statutory duty on a wide range of public bodies, including local councils. The Bill is currently progressing through the Lords. This duty would compel public bodies to actively consider and contribute to the achievement of environmental targets set under the Environment Act 2021 and the Climate Change Act 2008. Crucially for adaptation, the Bill explicitly includes a requirement to contribute to the delivery of the UK's national adaptation programme, effectively making local action on climate resilience a statutory obligation rather than a voluntary choice.

2.3.1.2 Scotland

A summary of the duties and powers of Local Government in Scotland to adapt to climate change is provided in *Table 9*.

Table 9: Summary of climate adaptation duties and powers of local authorities in Scotland

Type	Enabler	Scope	Description
Duty	Climate Change (Scotland) Act 2009	Scotland	Public bodies, including councils, must act in the way best calculated to help deliver Scotland's statutory climate change adaptation programme. Councils must report annually on how they are meeting these duties, including their contributions to the programme.
Duty	Town and Country Planning (Scotland) Act 1997 (as amended) & Planning (Scotland) Act 2019	Scotland	Councils have a duty to prepare development plans that address climate change. They have a legal duty to follow the policies in the National Planning Framework 4 (NPF4). This requires them to include policies that guide development away from vulnerable areas and enable places to adapt.
Duty	Flood Risk Management (Scotland) Act 2009	Scotland	Local authorities must work proactively to reduce flood risk. This includes preparing maps of water bodies and sustainable drainage systems (SuDS),

[76] Environmental Targets (Public Authorities) Bill [HL] - Parliamentary Bills - UK Parliament

Type	Enabler	Scope	Description
			developing Local Flood Risk Management Plans with partners, assisting with national flood risk assessment, acting to reduce overall flood risk sustainably, and raising public awareness.
Duty	Nature Conservation (Scotland) Act 2004	Scotland	Every public body must further the conservation of biodiversity in carrying out its functions. The Wildlife and Natural Environment (Scotland) Act 2011 strengthened this by requiring councils to report every three years on how they have met this duty.
Duty	Civil Contingencies Act 2004 & Contingency Planning (Scotland) Regulations 2005	UK-wide Scotland	Councils are Category 1 responders with mandatory duties to prepare for emergencies, including climate-related ones. They must assess risks, publish them in a Community Risk Register, maintain emergency plans, warn and inform the public, and coordinate with other responders.
Duty	Roads (Scotland) Act 1984	Scotland	Councils have a general duty to manage and maintain public roads. This includes a specific legal duty to take reasonable steps to prevent surface water from flowing off a road onto surrounding land.
Duty	Procurement Reform (Scotland) Act 2014	Scotland	This places a Sustainable Procurement Duty on councils. It requires them to consider how they can improve the environmental well-being of their area through their purchasing decisions.
Power	Planning Legislation (Scotland)	Scotland	Councils can use plan-making powers to write Local Development Plans with policies for climate resilience. They can use development management powers to impose conditions on planning applications, such as requiring sustainable drainage systems (SuDS) or setting minimum floor levels to avoid flooding.
Power	Flood Risk Management (Scotland) Act 2009	Scotland	The Act gives local authorities a general power to do anything they consider appropriate to manage flood risk. This includes designing and building flood

Type	Enabler	Scope	Description
			defence works through "flood protection schemes".
Power	Water Environment and Water Services (Scotland) Act 2003	Scotland	Provides a framework for councils to partner with agencies like the Scottish Environment Protection Agency (SEPA). They can implement measures like natural flood management schemes or wetland restoration from River Basin Management Plans.
Power	Coast Protection Act 1949	Great Britain	Maritime councils as designated as Coast Protection Authorities have powers to carry out coastal protection works to prevent erosion by the sea, relevant for sea-level rise and coastal erosion adaptation.
Power	Community Empowerment (Scotland) Act 2015	Scotland	Requires councils and other public bodies to produce Local Outcomes Improvement Plans (LOIPs). These plans can include goals for environmental resilience and adapting to climate impacts.
Power	Local Government in Scotland Act 2003	Scotland	This provides a "power to advance well-being". It allows a council to do anything it considers likely to promote or improve the economic, social, or environmental well-being of its area, which can be used for climate adaptation projects.
Power	Local Government (Scotland) Act 1973	Scotland	Provides councils with core powers to acquire and manage land. These can be used for adaptation projects like creating parks for urban cooling or moving assets away from at-risk areas.
Power	Public Health Etc. (Scotland) Act 2008	Scotland	Provides a framework for councils to work in partnership with NHS Health Boards to respond to health risks relevant to heatwaves, flooding, or disease vectors.
Power	Housing (Scotland) Acts	Scotland	Councils have powers to improve housing. This can support adaptation by funding measures such as improved insulation or better ventilation in homes.
Power	Transport Legislation (Scotland)	Scotland	Councils are empowered to manage local transport infrastructure. This allows them to make assets more resilient to climate change, for example by improving road drainage or strengthening bridges.

The explicit, overarching statutory adaptation duty for Scottish local authorities under the Climate Change Act (Scotland) is a key differentiator[77]. The unitary structure avoids the split responsibilities seen in two-tier areas of England.

2.3.1.3 Wales

A summary of the duties and powers of local government in Wales to adapt to climate change is provided in *Table 10*.

Table 10: Summary of climate adaptation duties and powers of local authorities in Wales

Type	Enabler	Scope	Description
Potential Duty	Climate Change Act 2008	UK-wide	Welsh Ministers must produce periodic reports on objectives, actions, and future priorities regarding climate change impacts. Local authorities are key implementing bodies and are expected to take account of these reports. Welsh councils can be directed or invited to prepare Adaptation Progress Reports. A legal duty for a council to report only exists if and when they receive a formal direction.
Duty	Well-being of Future Generations (Wales) Act 2015 (WFG Act)	Wales	Local authorities must carry out sustainable development and pursue seven statutory national well-being goals, including "A Resilient Wales". This requires them to set and meet objectives contributing to these goals, taking climate risks into account in decision-making and service delivery. Each local authority leads a Public Services Board (PSB) to prepare a Local Well-being Plan addressing local risks like climate change.
Duty	Flood and Water Management Act 2010	England and Wales	Unitary authorities are Lead Local Flood Authorities (LLFAs) with duties to manage and reduce local flood risks, including risk assessments, strategic planning, incident investigations, asset maintenance, and promoting sustainable drainage.
Duty	Environment (Wales) Act 2016	Wales	Section 6 imposes an enhanced biodiversity and resilience of ecosystems duty on public authorities to maintain and enhance biodiversity and promote

[77] Adapting to climate change - Progress in Scotland

			ecosystem resilience. Local authorities must publish a report on actions taken to comply. They are also expected to consider Natural Resources Wales' State of Natural Resources Report and "area statements".
Duty	Civil Contingencies Act 2004	UK-wide	Councils are Category 1 responders and must assess the risk of emergencies (including extreme weather events) and maintain up-to-date emergency and business continuity plans.
Duty	Social Services and Well-being (Wales) Act 2014	Wales	Local authorities have a statutory duty to promote the well-being of their communities, including protecting vulnerable people from public health risks associated with climate change, such as heatwaves.
Duty	Highways Act 1980	England and Wales	Highway authorities have a statutory duty to maintain public highways, including managing highway drainage.
Power	Local Government and Elections (Wales) Act 2021	Wales	Section 24 provides qualifying local authorities with a General Power of Competence (GPC) "to do anything that individuals generally may do" for the benefit of their area. This supersedes earlier well-being powers.
Power	Town and Country Planning Act 1990 & Planning (Wales) Act 2015	England and Wales	Local Planning Authorities have discretionary authority to shape climate-resilient communities. They can adopt stringent local planning policies (in LDPs or supplementary guidance) exceeding national standards for flood risk avoidance, green space, or sustainable drainage.
Power	Flood and Water Management Act 2010	England and Wales	Grants local authorities permissive powers to undertake works to manage flood and coastal erosion risk.
Power	Coast Protection Act 1949	Great Britain	Empowers maritime local authorities to conduct coast protection works (e.g. sea walls, beach nourishment) as climate adaptation measures, with Welsh Government approval and funding.
Power	Land Drainage Act 1991	England and Wales	Local authorities (in areas without internal drainage boards) have powers to maintain or improve ordinary watercourses and

			enforce against obstructions to reduce local flood risk on a permissive basis.
Power	Environment (Wales) Act 2016	Wales	Councils can go further than the Section 6 duty, e.g. by entering into management agreements with landowners to restore wetlands or plant woodlands for flood attenuation. The Sustainable Management of Natural Resources (SMNR) framework encourages innovative and collaborative projects.
Power	Countryside Act 1968	England and Wales	Councils can manage country parks and public rights of way, which can be used to enhance resilience (e.g. shading routes, improving upland catchments).
Power	Procurement Act 2023	England, Wales, and Northern Ireland	Local authorities can embed climate adaptation criteria into procurement processes, using the Act's flexibility to award contracts that contribute to the statutory Well-being Goals, including building a 'Resilient Wales'.

The Well-being of Future Generations Act provides a unique and powerful legislative driver, embedding long-term resilience thinking, including climate adaptation, across all local authority functions and decision-making processes. Combined with the Environment (Wales) Act's focus on ecosystem resilience, this creates a strong, integrated framework for sustainable development and adaptation. The formal regional structures (PSBs, CJCs) also facilitate collaborative approaches.

2.3.1.4 Northern Ireland

A summary of the duties and powers of local government in Northern Ireland to adapt to climate change is provided in *Table 11*.

Table 11: Summary of climate adaptation duties and powers of local authorities in Northern Ireland

Type	Enabler	Scope	Description
Duty	Climate Change Act (Northern Ireland) 2022 & Climate Change (Reporting Bodies) Regulations (Northern Ireland) 2024	Northern Ireland	The Act empowers DAERA to impose climate change reporting duties on specified public bodies, including district councils. Under the 2024 Regulations, these bodies must prepare adaptation reports assessing current and predicted climate change impacts on their functions, outlining adaptation proposals/policies, specifying implementation timescales, and evaluating progress. The first report

Type	Enabler	Scope	Description
			is due by 31 March 2026. Reporting bodies must regard the latest UK CCRA and NI's Climate Change Adaptation Programme.
Duty	Planning Act (Northern Ireland) 2011	Northern Ireland	District councils must prepare a Local Development Plan (LDP) and review the potential impact of climate change on their district's development. Councils must exercise planning functions to further sustainable development and consider central government policies, including those on climate adaptation. The Strategic Planning Policy Statement (SPPS) 2015 directs that planning should mitigate and adapt to climate change.
Duty	Wildlife and Natural Environment Act (Northern Ireland) 2011 (WANE Act)	Northern Ireland	Public bodies, including district councils, must further the conservation of biodiversity so far as is consistent with the proper exercise of their functions. This requires considering climate threats to local species and habitats.
Duty	Civil Contingencies Act 2004	UK-wide	District councils are Category 1 responders and have a legal duty to assess risks and prepare emergency plans for events threatening human welfare, including extreme weather. Councils collaborate through the Northern Ireland Civil Contingencies Framework (NICCF).
Duty	Northern Ireland (Miscellaneous Provisions) Act 2006	Northern Ireland	Imposed a duty on NI departments and district councils to carry out their functions in a way that contributes to sustainable development, which indirectly encompasses climate adaptation.
Power	Local Government Act Northern Ireland 2014	Northern Ireland	Part 11 gives councils a general power of competence to "do anything that individuals generally may do" for the benefit of their area, enabling discretionary climate adaptation initiatives.

Type	Enabler	Scope	Description
Power	Local Government Act Northern Ireland 2014	Northern Ireland	Introduced Community Planning, which councils lead to improve social, economic, and environmental well-being and contribute to sustainable development. This allows councils to shape local policy on adaptation through Community Plans.
Power	Health and Safety at Work (Northern Ireland) Order 1978	Northern Ireland	Councils can promote public health measures for people at work, for example during periods of heatwaves (e.g. opening cooling centres).
Power	Clean Neighbourhoods and Environment Act (Northern Ireland) 2011	Northern Ireland	Section 65 empowers councils to act against statutory nuisances, which can include issues exacerbated by climate change.
Power	Local Government Act (Northern Ireland) 1972	Northern Ireland	Section 90 gives councils powers to make local by-laws or undertake works on their property (e.g. investing in dune restoration or coastal defences on council-owned land).
Power	Procurement Act 2023	England, Wales, and Northern Ireland	Councils have the power to include climate adaptation criteria in their purchasing decisions. The Act allows them to give weight to wider public benefits, such as environmental resilience, when awarding contracts.

NI district councils now have explicit statutory duties compelling adaptation reporting under the Climate Change Act (Northern Ireland) 2022. However, their overall range of functions and associated powers is significantly narrower. The community planning duty offers a framework for integration but is less prescriptive than the WFG Act in Wales.

2.3.1.5 Implications of differing legal frameworks

As seen in the previous summary tables, the strength of the legal requirement for local authorities to prioritise and resource climate adaptation varies considerably across the UK. The broad, cross-cutting duties in Wales (WFG Act) and Scotland (Climate Act s44) provide a stronger legal mandate than the more function-specific duties in England or the new reporting duties in Northern Ireland. This difference can translate into varying levels of political and organisational prioritisation of adaptation across the nations.

Despite other variations, the planning system consistently emerges as a statutory lever available to local authorities in all four nations for influencing adaptation. Policies within Local Plans/Development Plans regarding land use allocation, development

design standards (where permissible), green infrastructure requirements, and flood risk management are critical tools for building long-term resilience. The effectiveness of this lever, however, depends on the strength of national planning policy (e.g., NPF4 in Scotland, PPW in Wales) and local implementation capacity.

Furthermore, many core local authority responsibilities necessitate adaptive responses, even if not explicitly labelled as 'adaptation duties'. These generally fall into two categories:

- Statutory duties specifically focused on managing climate hazards, such as the Lead Local Flood Authority role and emergency planning under the Civil Contingencies Act.
- Sector-specific duties where local authorities must ensure delivery remains robust against climate impacts. For example, social care services must protect vulnerable residents during heatwaves, and waste collection or highway maintenance must function during extreme weather.

Table 12 provides a comparative overview of the key statutory duties and permissive powers relevant to local authority adaptation across the UK nations.

Table 12: Comparative overview of key legislative instruments and associated adaptation challenges for UK local authorities

Nation	Nature of primary local authority adaptation duty/power
England	• **Climate change reporting:** There is no direct mandatory duty for councils in England to prepare adaptation reports. Instead, local authorities have been invited to submit reports voluntarily under the Adaptation Reporting Power (ARP), a process established by the Climate Change Act 2008. • **Planning:** Local Plans have a statutory duty to address climate adaptation under the Planning and Compulsory Purchase Act 2004. The National Planning Policy Framework (NPPF) sets out the national policy and guidance for how this duty should be met. • **Flood:** Lead Local Flood Authorities (LLFAs) have statutory responsibilities for local flood risk management under the Flood and Water Management Act 2010. • **Coastal:** Duties to manage coastal erosion and flood risk are embedded within broader flood and shoreline management legislation, with responsibilities often shared between authorities. • **Environment:** Environmental duties relating to adaptation are distributed across the Environment Act 2021 and biodiversity-related legislation.

Nation	Nature of primary local authority adaptation duty/power
	• **Civil/Emergency:** Local authorities hold duties under the Civil Contingencies Act 2004 as Category 1 responders to plan for and respond to climate-related emergencies. • **General powers:** The General Power of Competence (GPC) for discretionary action allows councils to go beyond mandatory duties if desired.
Scotland	• **Climate change reporting:** Local authorities report on climate adaptation actions under the Climate Change (Scotland) Act 2009, which places a statutory duty on public bodies to act in the way best calculated to contribute to climate change adaptation. • **Planning:** The National Planning Framework 4 (NPF4), which has statutory status, requires local development plans to incorporate climate adaptation measures, ensuring that resilience to climate impacts is embedded in spatial planning. • **Flood:** Under the Flood Risk Management (Scotland) Act 2009, local authorities have mandatory duties to reduce flood risk. This involves working in partnership with the Scottish Environment Protection Agency (SEPA) and other bodies. • **Coastal:** Maritime local authorities have discretionary powers under the Coast Protection Act 1949 to carry out works to protect the coast from erosion and sea encroachment. These are permissive powers, not a legal duty to protect every part of the coastline. • **Environment:** The Nature Conservation (Scotland) Act 2004 places a statutory duty on councils to further the conservation of biodiversity, which is a key mechanism for building ecosystem resilience to climate change. • **Civil/Emergency:** Under the Civil Contingencies Act 2004 and associated Scottish regulations, councils are designated Category 1 responders. They have mandatory duties to prepare for emergencies, including those that are climate-related. • **General powers:** Councils have broad powers under the Local Government in Scotland Act 2003 to advance well-being, enabling discretionary action on adaptation beyond statutory duties
Wales	• **Climate change reporting:** Councils report on adaptation through the Well-being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016. The UK Climate Change

Nation	Nature of primary local authority adaptation duty/power
	Act 2008 also provides a power for Welsh Ministers to direct them to produce formal reports. • **Planning:** The Well-being of Future Generations Act provides the overarching statutory duty for planning to contribute to a "Resilient Wales." This is delivered through Planning Policy Wales, which requires local development plans to include specific adaptation measures. • **Flood:** Councils have flood risk management duties as Lead Local Flood Authorities under the Flood and Water Management Act 2010. • **Coastal:** Responsibilities for coastal erosion and flood risk via Shoreline Management Plans and the Welsh Government's national strategy. • **Environment:** Environmental duties include promoting biodiversity and resilience under the Environment (Wales) Act 2016 and the Well-being Act. • **Civil/Emergency:** Category 1 responders under the Civil Contingencies Act 2004 with statutory emergency preparedness duties. • **General powers:** Eligible councils have a General Power of Competence (under the Local Government and Elections (Wales) Act 2021) and broad duties under the Well-being Act that enable discretionary adaptation actions.
Northern Ireland	• **Climate change reporting:** Under the Climate Change Act (NI) 2022 and subsequent 2024 regulations, district councils now have a statutory duty to prepare reports on their climate adaptation and mitigation actions, with the first report due in March 2026. • **Planning:** Adaptation measures are integrated through the Strategic Planning Policy Statement for Northern Ireland and local development plans, which require consideration of climate risks and resilience. • **Flood:** Flood risk management duties fall primarily to the Department for Infrastructure (DfI) under the Drainage (NI) Order 1973, with local councils supporting through planning and emergency response. • **Coastal:** The DfI has the main statutory responsibility for managing flood risk from the sea. Councils play a key role through land-use planning to control development in coastal

Nation	Nature of primary local authority adaptation duty/power
	erosion zones. They also have powers to carry out works like dune restoration or build coastal defences on land they own. • **Environment:** Councils have a statutory duty to further the conservation of biodiversity under the Wildlife and Natural Environment (NI) Act 2011, a key mechanism for building ecosystem resilience • **Civil/Emergency:** Councils are designated Category 1 responders under the Civil Contingencies Act 2004, with statutory duties for emergency preparedness, response, and recovery. • **General powers:** Local authorities possess broad discretionary powers under the Local Government Act (Northern Ireland) 2014, enabling action on adaptation and well-being beyond statutory obligations.

2.3.2 How are local authority roles defined in the National Adaptation Plans?

Given the extensive range of local authority roles and responsibilities, this concluding section of Chapter 2 summarises how the National Adaptation Plans have articulated the role of local authorities in the context of adaptation.

2.3.2.1 UK / England

The NAP3 is coordinated by the Defra but contains actions across government departments[2]. NAP3 explicitly acknowledges the role of local authorities, stating that central government works closely with them on adaptation measures[12]. It outlines several key expectations for local authorities:

- Ensuring the resilience of local service delivery to climate impacts.
- Raising awareness within local communities and involving them in adaptation efforts, explaining local climate changes and management options.
- Collaborating with central government and utilising centrally provided information (e.g., local climate projections).
- Supporting nature recovery as part of local resilience planning. In England, local authorities are subject to a statutory biodiversity duty (introduced under the Natural Environment and Rural Communities Act 2006 and strengthened by the Environment Act 2021), and are increasingly expected to integrate biodiversity and nature recovery into place-based planning and delivery (including through Local Nature Recovery Strategies and Biodiversity Net Gain in the planning system).
- Making informed decisions tailored to local circumstances to reduce climate impacts effectively.

2.3.2.2 Scotland

Scotland's approach is guided by the Scottish National Adaptation Plan (SNAP), with the third iteration (SNAP3) covering 2024-2029, launched in late 2024[20]. The SNAP3 also responds to the UKCCRA3. SNAP3 aims to build resilience across communities, public services, the economy, and the natural environment through five long-term outcomes and over 200 specific actions and proposals.

As noted above, a key distinction in Scotland is the explicit statutory duty placed on public bodies, including local authorities, under Section 44 of the Climate Change (Scotland) Act 2009[78]. This requires local authorities, in exercising their functions, to act in the way best calculated to help deliver the objectives of the current SNAP. Draft statutory guidance supporting this duty clarifies expectations for public bodies[79] which include:

- Identify relevant SNAP objectives.
- Conduct climate risk assessments.
- Develop and implement adaptation plans (considering just transition principles).
- Integrate climate risks into corporate risk registers.
- Align work with any specific actions assigned in SNAP.
- Collaborate with partners on place-based adaptation.

SNAP3 itself commits to supporting local authorities and public services through facilitating peer-to-peer support, providing guidance, and potentially funding initiatives like the national network of Community Climate Action Hubs[80].

2.3.2.3 Wales

Wales's national approach is set out in the Climate Adaptation Strategy for Wales[21], published in October 2024, which replaces the previous plan, 'Prosperity for All: A Climate Conscious Wales' (PfACCW) 2019-2024[81] . The strategy also responds to UKCCRA3 and CCC progress reports, aiming for a resilient Wales through a systems-based approach. Adaptation in Wales is strongly framed by two key pieces of devolved legislation:

- The **Well-being of Future Generations (Wales) Act** 2015 (WFG Act)[82] requires public bodies (including local authorities) to pursue sustainable development, contributing to seven national well-being goals. One goal, "A resilient Wales," explicitly includes building capacity to adapt to climate change. The Act mandates long-term thinking, integration, collaboration, prevention, and involvement in decision-making.

[78] Climate Change (Scotland) Act 2009 Section 44
[79] Draft statutory guidance public bodies putting climate change duties practice
[80] Community-led climate action - Climate change
[81] Prosperity for All: A Climate Conscious Wales
[82] Well-being of Future Generations (Wales) Act 2015 Section 4

- The **Environment (Wales) Act** 2016 establishes a framework for the sustainable management of natural resources and includes a duty (Section 6)[83] for public authorities to maintain and enhance biodiversity and promote ecosystem resilience.

The 2024 Climate Adaptation Strategy explicitly outlines roles for local authorities across partnership working, ensuring service resilience, building community resilience (linking to WFG Act duties), and demonstrating leadership. It calls on local authorities to take specific actions in areas like planning, nutrient management, sustainable drainage systems (SuDS), and potentially adaptation reporting. The integration of adaptation within the broader, legally mandated frameworks of sustainable development and well-being provides a potentially powerful driver for local authority action in Wales.

2.3.2.4 Northern Ireland

Adaptation planning in Northern Ireland is guided by the Northern Ireland Climate Change Adaptation Programme (NICCAP). NICCAP2 covered the period 2019-2024[84], and NICCAP3, also responding to UKCCRA3, is currently under development and awaiting consultation. DAERA coordinates the NICCAP process.

A significant development is the Climate Change Act (Northern Ireland) 2022[85], which establishes a legal framework for climate action. While primarily focused on mitigation, the Act requires all Northern Ireland departments to contribute to targets and climate action plans. Under Section 42, the Department of Agriculture, Environment and Rural Affairs (DAERA) introduced regulations that impose climate change reporting duties on public bodies. These regulations came into force in May 2024. They require 40 public bodies, including district councils, to report on their climate adaptation and mitigation actions[86]. The first adaptation reports were due in March 2026.

NICCAP2 included a specific chapter outlining adaptation actions for local government and civil society[87]. These actions focused on embedding the adaptation cycle into council planning, exploring capacity needs, piloting monitoring processes, sharing learning, and accounting for adaptation within Local Development Plans. The introduction of potential mandatory reporting under the 2022 Climate Act[88] could significantly strengthen the formal role and accountability of councils in adaptation going forward.

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[83] Environment (Wales) Act 2016 Section 6
[84] Northern Ireland Climate Change Adaptation Programme 2019-2024 | DAERA
[85] Climate Change Act (Northern Ireland) 2022
[86] Climate Change Act (Northern Ireland) 2022 Section 42
[87] NI Climate Adaption Programme 2019-2024 End of Programme Review
[88] Section 42(1) states: "The Department may by regulations make provision requiring specified public bodies to prepare reports on— (a) the current and predicted impacts of climate change in relation to the bodies' functions, and (b) the bodies' proposals and policies for adapting to those impacts."

Chapter 3: What are current drivers and barriers to local adaptation?

This chapter outlines the primary challenges faced by local authorities in the UK in addressing climate risks and opportunities and how best to respond to these challenges. It draws on a range of recent national assessments and studies of local authority adaptation activities and on direct feedback from local authority representatives and key stakeholders gathered through targeted workshops and interviews. Throughout this chapter, feedback from participants are highlighted in *"double quotations marks and italics"*.

Text Box 2: Local authority workshop method

Local authority workshop method

Two online workshops were held in April 2025 to gather views from local authorities (LAs) across the United Kingdom on climate adaptation. These sessions formed a major part of the evidence base for this section of the report and ensured that the findings reflect the reality of local government experience.

More than 240 people attended across the two workshops. Participants were officers from councils in all four UK nations, covering a wide range of services including planning, climate change, environmental health, highways, flood risk, public health, social care, finance, and emergency management. The second workshop focused specifically on Northern Ireland, allowing officers there to discuss the challenges linked to their different structures and duties.

The workshops were designed to be open and interactive. They included:

- short presentations to set the context
- live voting on key questions
- open comment discussions
- opportunities for participants to share examples or concerns directly related to their local work.

This approach allowed the workshops to gather both numerical results (such as voting on priority risks) and detailed written comments, which gave deeper insights into participants' experiences.

Participants were invited to vote on and comment on:

- the main climate risks affecting their area
- the services and assets most vulnerable to climate impacts
- their current state of preparedness

- the barriers that limit progress
- the types of support or changes needed from national government.

For further details on the local authorities represented at the workshop, see *Appendix 1: Climate adaptation workshop – summary findings*

3.1 What is the current state of local authority climate adaptation preparedness in the UK?

3.1.1 Local adaptation progress

As noted above, the CCC conducts independent assessments of progress towards implementing the national adaptation programmes. The Progress Reports for the UK (2025)[89], Scotland (2023)[90], Wales (2023)[91], and Northern Ireland (2023)[92] report at a national (or devolved national) scale, rather than assessing individual local authorities. The National Audit Office (NAO) has pointed to a lack of clarity regarding the specific roles and responsibilities expected of local authorities in contributing to national climate goals (primarily focused on Net Zero, but relevant to adaptation governance) and poor coordination between central government departments when engaging with the local government sector[93].

3.1.2 Local adaptation planning

A significant number of local authorities have formally acknowledged the climate emergency, with over 300 such declarations across the UK[94]. This high-level recognition, however, has not uniformly translated into adaptation preparedness. The development of formal adaptation plans and strategies by LAs is a critical initial step in systematically addressing climate risks. Nevertheless, research by the LGA in 2023, "Accelerating adaptation action," indicated varying levels of preparedness but also a clear willingness within the local government sector to accelerate adaptation planning efforts[5].

Text Box 3: The state of adaptation planning across the four nations in the UK

The state of adaptation planning across the four nations in the UK

In England, several local authorities reported on their adaptation progress under a pilot initiative - the voluntary fourth round of adaptation reporting (ARP4). The uptake of voluntary reporting under this initiative provides some indication of formal adaptation planning activity. As of February 2025, only 13 local authorities had published reports under this scheme[95]. While this number reflects early engagement

[89] Independent Assessment of the Third National Adaptation Programme (NAP3)
[90] Adapting to climate change - Progress in Scotland
[91] Adapting to climate change - Progress in Wales
[92] Adapting to climate change - Progress in Northern Ireland
[93] Local government and net zero in England
[94] Local-Authorities-and-the-Sixth-Carbon-Budget
[95] Climate adaption reporting fourth round: local authority

with a new reporting cycle, it shows that formally documented and reported adaptation planning is not yet a widespread practice among English local authorities.

The situation in Scotland shows a similar pattern. A 2025 study by ClimateXChange found that fewer than one-third of Scottish local authorities have a dedicated adaptation plan[96]. Adaptation measures are often integrated into other documents, and the study highlighted instances of confusion in public bodies' adaptation plans between climate change adaptation (responding to impacts) and climate change mitigation (reducing greenhouse gas emissions).

In Wales, the CCC's 2023 progress report on adaptation noted that only 57% of local authorities had incorporated adaptation measures into their broader climate action plans. Furthermore, these inclusions were often limited in scope, primarily focusing on flood-related actions or representing initial exploratory work undertaken through Public Service Boards (PSBs). The Welsh Government's 2024 Climate Adaptation Strategy actively encourages local authorities to engage more formally in adaptation reporting, signalling an intent to bolster planning in this area[21].

The End of Programme Report for Northern Ireland's Second Northern Ireland Climate Change Adaptation Programme (NICCAP2) showed mixed progress among the 11 local councils in developing adaptation plans[84]. Some councils, such as Derry City and Strabane District Council[97] and Antrim and Newtownabbey Borough Council[98] have now completed their adaptation plans while others are still in development.

NAP3 also includes a commitment to pilot a dedicated Local Authority Climate Service, delivered by the Met Office (which is now operational)[99], to provide easier access to localised climate data for all UK local authority areas to support adaptation planning.

Where adaptation planning is occurring, it is often integrated into broader strategic documents rather than existing as standalone adaptation plans. These include climate emergency declarations, Net Zero plans, or general sustainability strategies or even top-level economic and place strategies[94]. While such integration can be positive, helping to ensure that adaptation is not treated as an isolated issue, there is a risk that it can be overshadowed by the more prominent focus on climate change mitigation. This concern was explicitly raised by local authority representatives in the workshop, with one stating, *"Mitigation takes priority"* and another calling to *"Raise profile of adaptation to match mitigation"*.

Despite these challenges, there are examples of local authorities developing more mature and collaborative approaches to adaptation planning. The Climate Ready Edinburgh Plan 2024-2030, for instance, is a partnership initiative involving the City of Edinburgh Council and various other key city stakeholders, including Scottish Water,

[96] Public bodies adaptation planning | ClimateXChange
[97] Derry City and Strabane District Council Climate Adaptation Plan
[98] Climate Change | Action Plan - Antrim & Newtownabbey Borough Council
[99] Local Authority | The Met Office climate data portal

NHS Lothian, and academic institutions[100]. At the individual authority level, Cambridge City Council's 2024 Climate Change Risk and Vulnerability Assessment and Adaptation Plan provides a detailed example of how a district authority is approaching the issue[101].

3.1.3 Climate risk assessment practices

The prevalence of formal climate risk assessments also varies across the UK. The CCC's 2025 progress report indicates that 27% of all local authorities in England currently have climate risk registers in place. This figure is somewhat higher for larger authorities, such as County and Combined Authorities, and for London Boroughs, where rates range from 36% to 39%[3]. The percentages are also supported by the responses at a recent local authority webinar held to collect additional evidence for this report (See *Appendix 1: Climate adaptation workshop – summary findings*). Only 32% of participants at the workshop indicated that their council had conducted a climate risk assessment (see *Figure 1*)

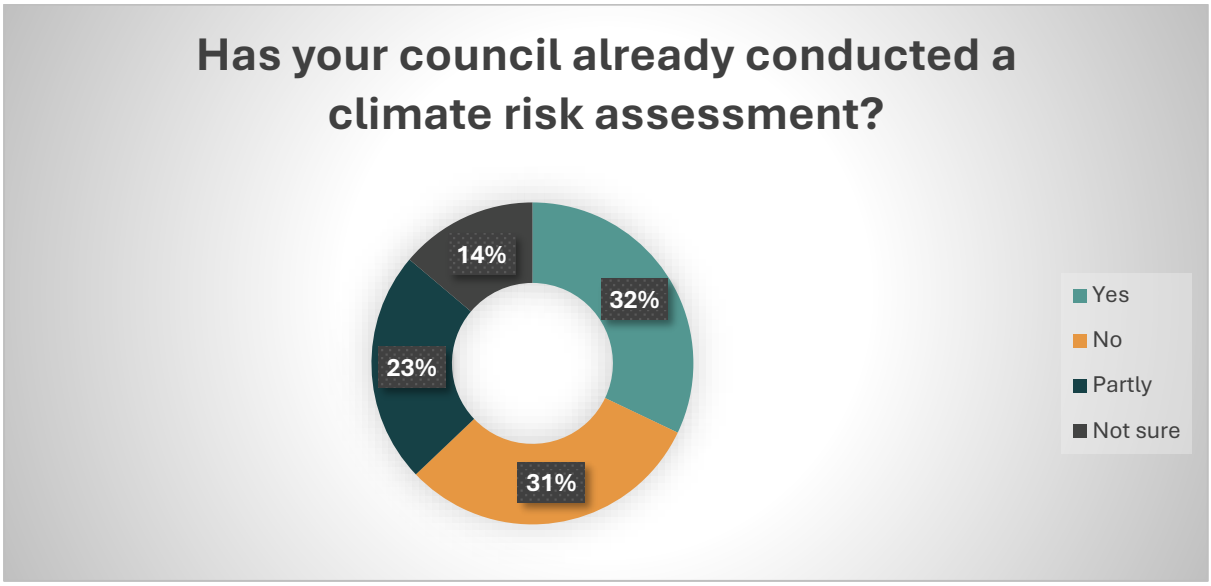

Figure 1: Workshop responses on whether local authorities have already conducted a Climate Risk Assessment

In Scotland, the situation appears somewhat different, with the 2025 ClimateXChange study finding that approximately two-thirds of local authorities have access to a Climate Change Risk Assessment (CCRA), often facilitated through regional consortia[96]. However, an important caveat is that these CCRAs tend to focus on identifying climate hazards (e.g., increased rainfall, temperature rise) without necessarily conducting detailed assessments of local exposure or vulnerability to these hazards, and impact on council service delivery.

The Welsh Government's 2024 Climate Adaptation Strategy states an intention from all Public Services Boards (PSBs)[38], which include local authority leaders, to conduct formal climate change risk assessments as a precursor to developing more specific

[100] Climate Ready Edinburgh Implementation Plan
[101] Climate Change Risk and Vulnerability Assessment and Adaptation Plan - Cambridge City Council

action plans[21]. This signals a commitment to improving risk understanding at a strategic level in Wales.

In Northern Ireland, the Northern Ireland Climate Change Adaptation Programme (NICCAP) was developed in direct response to the risks identified in the UK CCRA. DAERA engaged sectoral experts and local governments in this process[87]. Individual councils, such as Belfast[102] and Ards and North Down Borough Council are developing their own risk registers as part of their adaptation planning[103]. During the NI local authority workshop, several councils noted they had developed initial climate plans covering both adaptation and mitigation.

3.2 What are the key challenges for local authorities in climate adaptation?

Local authorities across the UK face a range of significant and often interconnected challenges in their efforts to plan for and implement climate adaptation measures. These include resourcing, governance, policy, organisational capacity, and public engagement. Feedback from adaptation workshops indicated that these challenges fall across different domains (see *Figure 2*), and are particularly significant in terms of budgets, skill and political support.

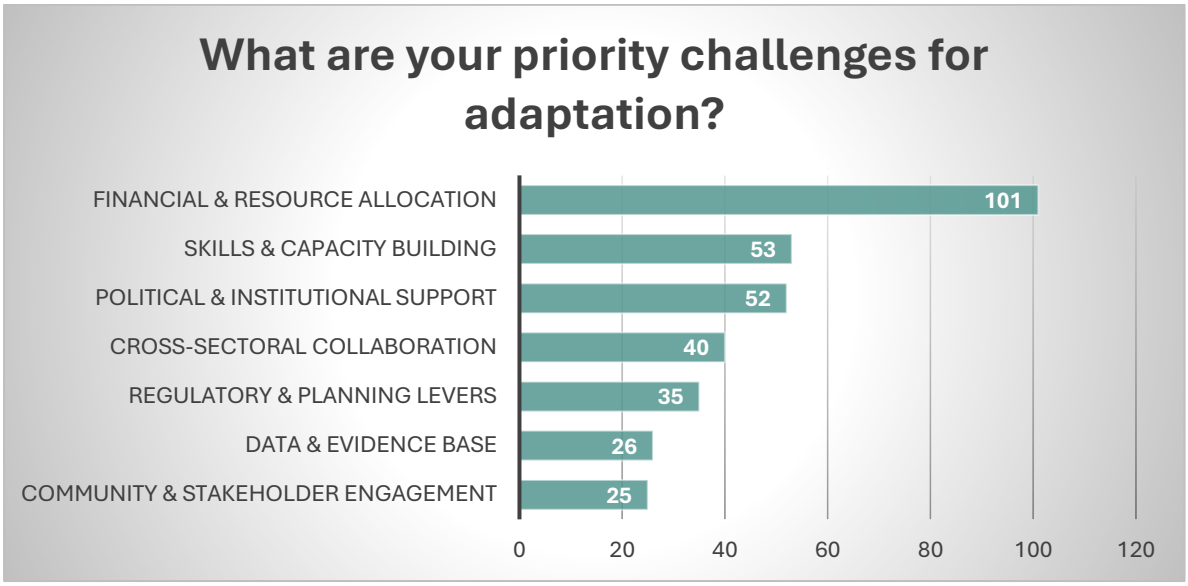

Figure 2: Workshop responses on what the priority adaptation challenges are for local authorities

3.2.1 Severe resource constraints (funding, staffing, capacity & skills)

The most pervasive and frequently cited barrier in the workshops and wider research to local authority climate adaptation was the severe constraint on resources (*Figure 2*). This constraint includes lack of funding, insufficient staffing levels, limited overall organisational capacity, and a shortage of specialised skills. This resource challenge

[102] Belfast City Council: Climate Change Risk Assessment
[103] Climate Adaptation Plan - Ards and North Down Borough Council

was also identified as the top barrier by 93% of authorities in an LGA survey focused on addressing climate impacts[5] and is consistently echoed in reports concerning County Councils[104], smaller local authorities, and local government generally[105].

3.2.1.1 Funding

Local authorities face a critical shortage of dedicated funding for both the planning stages of adaptation and, crucially, for the implementation of adaptation measures. Participants in the local authority workshops expressed frustration, with comments such as, *"Finding the resources and money to build a plan - when there's no money - and then to deliver it"*. The available funding is often short-term and based on competitive grant applications, rather than being integrated into core local authority budgets[106]. This creates uncertainty and hinders long-term strategic planning, as one participant noted, *"Only short-term grant funding available"*. The difficulty in securing investment for many adaptation measures (excluding flooding schemes which deliver a strong business case), which often does not demonstrate a direct or immediate financial return, was also stressed: *"Adaptation investment is so tricky as it does not deliver a return on investment... requires national legislation and funding"*. Another participant highlighted the difficulty of *"Justifying the spend now for a benefit that won't be seen until future years... in a context of ever tightening budgets"*. The National Audit Office has also drawn attention to the struggling financial state of many councils, which compounds these specific funding challenges for adaptation[107].

3.2.1.2 Staffing and capacity

Insufficient staffing and limited overall capacity within local authorities are additional roadblocks. Many authorities operate with very few, if any, dedicated climate adaptation officers. Workshop contributions painted a stark picture: *"part time officer leading this work"* or *"No money and one member of staff working on climate change"*. Even where some staff are present, they often lack the *"brain space' across all services"* to adequately address the cross-cutting nature of adaptation. This issue of limited human resources is particularly acute for smaller local authorities, which may lack the economies of scale of larger authorities[94].

3.2.1.3 Skills

A shortage of specialised skills required for effective climate adaptation planning and implementation further exacerbates the resource constraints. Local authorities report they *"Lack specialist local skills and therefore capacity to set deliverable local priorities"*. This skills gap is not just about technical expertise in climate science or engineering. It also includes skills in risk communication, community engagement, partnership working, and making the economic case for adaptation. The LGA's research identified an appetite for climate adaptation literacy training, particularly for senior

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[104] Rising to the Climate Challenge
[105] The Economic Benefits of Local Climate Action
[106] Local government and legal responsibilities to act on climate change | LGA
[107] Govt flying blind on struggling council finances amid unprecedented local audit crisis

roles and finance directors[106], and the County Councils Network (CCN) highlighted the need for greater investment in skills and expertise for County Councils[104].

The overarching impact of these resource constraints is profound. As succinctly put by workshop participants, *"It doesn't matter what policy support there is for local authorities without resource,"* and *"Powers and duties need to be backed by resources and capacity"*. Without adequate funding, staffing, and skills, local authorities will continue to struggle to move beyond reactive responses to climate impacts towards proactive, long-term adaptation.

3.2.2 Lack of strong statutory duties and clear legal drivers

A significant number of local authority representatives at the workshops noted that the absence of a clear and robust statutory duty for local authorities (particularly in England) to adapt to climate change is a fundamental barrier to progress. This view is increasingly gaining traction, as evidenced by the LGA's recent consultation on whether councils should be assigned such duties[106] and by the Environmental Targets (Public Authorities) Bill[108] (a Private Members Bill) which seeks to impose a statutory duty on a wide range of public bodies.

The non-statutory nature of much adaptation work has direct consequences for its prioritisation and resourcing within local authorities. In an environment of constrained budgets and competing demands, activities that are not legally mandated often struggle to secure commitment and funding, particularly when compared to core statutory services. As workshop participants noted, *"Council's will struggle to get commitment in this economic climate unless a clear statutory duty exists."* The sentiment that *"Without a statutory duty, adaptation action will lose out"* was prevalent. Another participant stated, *"The policy support is great, but until it's a legal requirement a council's focus has to be prioritised elsewhere"*.

Even where guidance exists, it is sometimes perceived as lacking the necessary teeth to drive action. Referring to draft statutory guidance for public bodies on climate change duties[109], one participant noted it contained *"a lot of 'should' and 'could' and very few 'MUSTS'"*. This perception of weak guidance undermines efforts to embed adaptation as an essential function. The call by some representatives to *"Make (Adaptation Reporting Power) ARP mandatory!"* for local authorities reflects a desire for stronger, more explicit drivers for adaptation activity and reporting.

3.2.3 Navigating a challenging policy, governance, and information landscape

Local authorities operate within a complex and often challenging broader environment encompassing national policy, inter-governmental governance, and information

[108] Environmental Targets (Public Authorities) Bill [HL] - Parliamentary Bills - UK Parliament
[109] Public Consultation Summary - Climate change duties - draft statutory guidance for public bodies: consultation

availability, all of which significantly impact their ability to deliver effective climate adaptation.

3.2.3.1 Policy landscape

The national policy landscape for climate adaptation was described by local authority practitioners as *"muddy and changing"*. There is a perception of a lack of clear, consistent, and joined-up direction from national government, coupled with insufficient strong leadership on adaptation. The CCC has previously noted that adaptation and climate risks are still only weakly integrated with wider government resilience efforts and other key policy agendas[3]. This lack of a coherent national framework creates uncertainty for local authorities and makes it difficult for them to align their local strategies with national priorities.

3.2.3.2 Clarity of roles and responsibilities

A significant issue is the lack of clarity regarding roles and responsibilities for adaptation, both internally within local authorities and externally between different tiers of government and other stakeholders. Clear guidance on roles and responsibilities was one of the top requests from local authorities to central government in an LGA survey[5]. Workshop participants asked, *"What's our role? What is that of others? How do we agree something collectively?"* and highlighted a *"Lack of clarity on who should lead on different aspects of adaptation locally/regionally"*. This ambiguity can lead to duplication of effort, gaps in provision, and inaction due to uncertainty over accountability.

3.2.3.3 Data and information issues

Access to appropriate data is crucial for understanding risks and planning effective adaptation measures, yet this remains a major challenge. Local authorities expressed a strong need for better data, particularly granular local data that can inform specific interventions. A critical barrier identified is the difficulty in accessing and sharing data with key infrastructure providers. As one workshop participant stated, *"How best to bring together infrastructure providers to share data and evidence on cascading risks? Data sharing issues are significant barrier..."*. Another noted how it is *"Hard to measure and no national vision/ data sharing requirements across infrastructure providers"*.

3.2.3.4 Design standards and built environment

There is concern that current design standards for buildings and infrastructure are not adequately accounting for future climate change, thereby *"building in risk across all aspects of the built environment and infrastructure"*. This means that new developments may not be resilient to future climate impacts, creating legacy issues for local authorities, businesses and communities to manage.

3.2.3.5 National coordination and leadership

Local authorities have called for stronger national leadership and better coordination between government departments, urging them to "join up" their efforts and for departments like Defra to become *"more assertive"* in driving the adaptation agenda.

The CCC has echoed these calls, recommending improved coordination across government for adaptation policy and delivery[3].

3.2.3.6 Impact of local government reorganisation and devolution

The ongoing processes of Local Government Reorganisation (LGR) and devolution add another layer of complexity to the governance landscape. While these changes can be *"chaotic,"* they also present *"immense opportunity"* for more strategic and joined-up adaptation efforts, provided that local authorities have the necessary adaptation skills and capacity in place to leverage these opportunities.

3.2.4 Internal organisational barriers and the need for a whole-council approach

Beyond external pressures, local authorities also face significant internal organisational barriers that hinder effective climate adaptation. A central theme emerging from local authority feedback is the critical need for adaptation to be treated as a corporate priority, embedded across all council functions, rather than being confined to specialist teams.

3.2.4.1 Siloed working

A major impediment is the prevalence of siloed working within local authorities. Adaptation is often perceived as the responsibility of a small "sustainability team or similar," which may lack the seniority, influence, or resources to drive change across the entire organisation. As one workshop participant observed, *"Siloed working in* local authorities *means it is very hard for any climate related issues to be picked up and affect the ways all teams work"*. This departmentalism makes it difficult to address the cross-cutting nature of climate impacts and to implement integrated adaptation solutions. Another commented, *"It is cross-departmental activity and often it gets assumed to be someone else's job..."*.

3.2.4.2 Embedding adaptation as a core responsibility

There is an acknowledged need to embed adaptation as part of everyone's "day job". However, achieving this is challenging. local authority officers report *"Difficulty convincing colleagues when they have full workloads already and don't see this as a priority"*. The sentiment that adaptation is an additional burden on top of existing responsibilities, rather than an integral part of them, is a significant hurdle: *"The comment on doing this on top of the day job when people need to see this as their day job"*. There is a *"Lack of capacity to truly embed adaptation across the organisation"*.

3.2.4.3 Securing buy-in

Gaining genuine buy-in from colleagues across different departments and, crucially, from senior management and elected members, is a persistent challenge. Understanding of adaptation issues can be low at senior levels, making it difficult to secure the necessary commitment and resources. One participant noted, *"Poor understanding at senior level - bad enough with mitigation - so really difficult to get buy-in with decision-makers"*. Another reported, *"Lack of buy in from council colleagues"*

and *"No buy-in from senior leadership"*. This lack of internal support is also highlighted by the LGA, which points to the need for senior executives and leaders to drive climate conversations from the top down[5].

3.2.4.4 Staffing insecurity

The prevalence of temporary or fixed-term contracts for staff working on climate change issues within local authorities contributes to a lack of continuity and hinders the development of long-term institutional capacity and expertise in adaptation. *"Climate workers in local authorities are often on temporary or fixed-term contracts"*. This can lead to a constant cycle of recruiting and training, and a loss of embedded knowledge when contracts end.

3.2.5 Difficulties in prioritising adaptation over other duties and responsibilities

Securing prioritisation for climate adaptation within local authorities is a consistent struggle, often due to competition with more immediate crises, and existing statutory duties that take priority in budgets.

3.2.5.1 Competition with immediate crises and statutory duties

Local authorities operate in an environment of multiple pressing demands and finite resources. Adaptation, which deals with future, often uncertain risks, frequently loses out to more immediate crises, such as social care pressures or emergency response to acute events. As one workshop participant stated, it is *"Difficult to get people to think about future risks and adaptation when there are present issues with resource and time for current issues"*. Another noted, *"Funding - but also getting this prioritised when the council is faced with current crises..."* and that *"'Blue light' emergency reaction prioritised over long-term adaptation"*. Existing statutory duties, with their legal obligations and associated performance targets, also tend to take precedence over the largely non-statutory area of adaptation.

3.2.5.2 Prioritisation against mitigation efforts

While adaptation and mitigation are both important climate actions, adaptation sometimes struggles for visibility and resources compared to mitigation. Mitigation efforts, such as reducing carbon emissions, can appear to have clearer targets, more established funding streams, and more tangible, measurable outcomes (e.g., renewable energy generation, tonnes of CO_2 reduced). This can lead to a situation where *"Mitigation takes priority"* or the *"Focus is on mitigation- for legislation and funding resulting in a lack of resource or care for adaptation"*. This is backed by research by UK100 which found that while around 75% of local authorities have declared climate emergencies, less than 12% of these declarations explicitly mention adaptation, further indicating a primary focus on mitigation[105].

3.2.5.3 Difficulties in quantifying benefits and the cost of inaction

A major hurdle in making the business case for some adaptation measures (outside of flood management schemes) is the difficulty in quantifying its benefits in monetary

terms, or conversely, clearly articulating the cost of inaction. Adaptation measures often involve upfront investment to avoid future damages that are uncertain in their timing and magnitude. This makes traditional cost-benefit analysis challenging. Workshop participants highlighted the *"Challenge of making the case when we don't fully understand the cost of inaction"*. Unlike some mitigation projects (e.g., renewable energy schemes that can generate income), adaptation often has *"no obvious income stream"*, making it harder to justify expenditure in purely financial terms. One comment was, *"Hard to quantify £ benefits of adaptation or generate income, no obvious income stream unlike mitigation / renewables"*.

3.2.6 Importance and challenges of partnership, engagement, and coordination

While the value of collaborative working is widely acknowledged by local authorities, establishing and maintaining effective partnerships, engaging meaningfully with regional organisations, communities and businesses, and ensuring robust coordination present significant practical challenges.

3.2.6.1 Acknowledged value of partnership

Local authority representatives recognise the importance of working collaboratively with a wide range of actors, including local communities, businesses, other local authorities, and infrastructure providers, to deliver effective adaptation. The interconnected nature of climate risks and adaptation solutions often necessitates action beyond the administrative boundaries or direct control of a single local authority.

3.2.6.2 Challenges in engagement

Despite this recognition, effective engagement is often difficult to achieve. Specific challenges were reported in involving businesses in adaptation efforts. Communicating complex climate risks to the public, particularly when current levels of understanding may be low or when people are preoccupied with more immediate concerns (*"No one has 'headspace' to deal with this, everyone is so busy"*), is a major hurdle. One participant noted, *"Levels of understanding are very low, so communicating risks is very difficult"*.

3.2.6.3 Regional coordination gaps

For climate impacts that traverse local administrative boundaries, such as those affecting water supply or catchment-wide flood risk, a lack of effective regional coordination is a key concern. As one webinar participant stated, *"Funding, really hard to work collaboratively across local authorities without certainty of regional funding and structures. Many of these risks are too big to deal with local authority by local authority"*. Another highlighted, *"There's a lack of regional co-ordination on widespread climate impacts - water supply risks particularly"*.

3.2.6.4 Community engagement and enabling behaviour change

Effective adaptation often requires a range of interventions including enabling changes in behaviours or practices at the community and individual level, as well as within

professional practices. Workshop participants identified that *"Community engagement, behavioural change and local skills to deliver will be crucial"*. However, achieving *"Real and deep behaviour change. E.g. getting engineers to do things differently"* or *"Behavioural and mindset change in local population and businesses"* is a complex and long-term undertaking. It involves *"Taking responsibility for the future of our communities - and working with those communities for a better outcome"*.

3.2.7 Insufficient understanding, awareness, and knowledge of adaptation

Another key challenge underpinning many other barriers is an insufficient level of understanding, awareness, and knowledge regarding climate change adaptation. This deficit can exist at all levels, from senior leadership and elected members within local authorities to different council departments, partner organisations, supplier organisations and the wider community.

3.2.7.1 Lack of deep understanding

While climate change as a general concept may be relatively well understood, the specific implications for adaptation (i.e. what it means in practice, why it is important, and how to implement effective measures) are often less clear. One workshop participant noted, *"Fully understanding adaptation and realising the importance amongst a sea of competing priorities"* is a key challenge. Another stated, *"Awareness - climate change is a well understood concept but the concept of adapting to it, less so"*. This general lack of understanding and lack of knowledge can hinder the development of robust adaptation strategies and actions.

3.2.7.2 Confusion with mitigation

Another common issue is the confusion between climate adaptation and climate mitigation. This was also identified as a common finding in a ClimateXChange study of public bodies in Scotland[96]. When the distinctions are not clear, adaptation can be overlooked, or mitigation actions may be mistakenly assumed to address adaptation needs adequately.

3.2.7.3 Awareness at decision-making levels

Insufficient understanding and awareness among elected members and senior leadership within local authorities is a particular concern, as it directly impacts political will, resource allocation, and the overall prioritisation of adaptation. The LGA's research also pointed to an appetite for climate adaptation literacy training, especially for senior roles[5], implicitly acknowledging a current knowledge gap.

3.3 What is working well?

Alongside the challenges listed above, the workshops showed that important positive steps are already happening across the UK. Local authorities highlighted several areas where progress is emerging:

- **Partnership working is strengthening.** Officers consistently described growing collaboration between councils, regional bodies, national agencies, community

groups, and specialist networks. These partnerships are helping to share knowledge, pool resources, and tackle cross-boundary risks more effectively.

- **Awareness and understanding of adaptation are improving.** Councillors, senior managers, frontline officers, external partners, and communities are becoming more aware of climate risks and the need for adaptation. This change in understanding is an important foundation for future progress.
- **Nature-based solutions are being put into practice.** Councils reported strong momentum behind peatland restoration, tree planting, SuDS schemes, nature networks, and "wilder" green-space management. National policies such as Biodiversity Net Gain (BNG) and Local Nature Recovery Strategies (LNRS) are helping to turn this activity into standard practice.
- **Policy and strategic planning are developing.** Local and regional bodies are producing new plans and using adaptive approaches for example Coastal Change Adaptation Plans, regional risk assessments, and city-level strategies. National measures such as Part O (overheating) of building regulations were also viewed as helpful.
- **Support networks, tools, and guidance are making a difference.** Officers pointed to the value of programmes like Adaptation Scotland, public sector climate networks, toolkits, benchmarking frameworks, and shared learning platforms, especially for authorities with limited in-house capacity.
- **Local leadership is emerging in some places.** While not universal, several councils reported supportive councillors, engaged managers, and staff who are willing to test new approaches. Internal cultural shifts (such as more cross-departmental conversations) are beginning to take root.
- **Practical on-the-ground action is growing.** Councils described a range of real-world adaptation activity, particularly in flood management, drainage improvements, coastal defence projects, and changes to operational practice (such as adapting outdoor working during heat).
- **Community interest and grassroots activity are increasing.** Schools, charities, and community groups are becoming more involved, with councils supporting local climate toolkits, community-led projects, and neighbourhood-level adaptation planning.

3.4 How can challenges be addressed?

The positive examples listed above give a strong foundation to build on, but turning them into consistent progress across all councils will require wider changes. The following section outlines the changes needed to strengthen and scale up this work.

3.4.1 How can national government support effective local adaptation?

Effective climate adaptation at the local level is reliant on a robust, coherent, and supportive national framework. Without strategic direction, adequate resourcing, and

clear legal drivers from central government, local authorities will continue to struggle to translate adaptation intent into tangible and widespread resilience outcomes.

3.4.1.1 Coherent national leadership, clear policy direction, and strategic vision

Participants in the workshops highlighted that a requirement for unlocking effective local adaptation is the establishment of strong, visible national leadership that consistently champions climate adaptation as a critical national priority. local authority representatives have explicitly called for *"Strong leadership (not Defra)"*, indicating a perception that adaptation leadership needs to be driven from a more central, coordinating part of government, such as the Cabinet Office or HM Treasury. This would ensure genuine cross-government prioritisation and overcome departmental silos. This perspective aligns with findings from the National Audit Office concerning the need for senior leader buy-in and effective cross-government coordination to tackle complex challenges[110].

The current national policy landscape for adaptation has been described by local authorities as confusing, creating uncertainty and hindering effective local planning. There is a clear demand for a stable, long-term national adaptation policy direction that resolves existing policy conflicts. As one workshop participant articulated, there is a need for *"Consistency and clarity on conflicts/priorities with other Government missions. Too often policy competes not complements"*.

To address this, the government needs to improve overarching adaptation objectives and targets. This involves providing an "actionable and measurable framework"[3] and clearly communicating the respective roles and responsibilities of central and local government, the private sector, and households in both delivering and funding adaptation.

3.4.1.2 Reforming and ensuring sufficient funding mechanisms

The dominant appeal from local authority representatives participating in the adaptation workshops was unequivocally for adequate and appropriate funding: *"Funding! Funding! Funding!"*. This sentiment reflects a critical barrier detailed earlier in this chapter, where local authorities face a severe shortage of dedicated funding for both risk assessing, planning and, crucially, implementing adaptation measures. The current funding landscape, often characterised by short-term, competitive grant applications, actively undermines long-term strategic planning and the development of sustained local capacity. As one officer said, *"Long term funding - not competitive and more than 1 year to deliver!"* is desperately needed. Another highlighted the core challenge: *"Finding the resources and money to build a plan - when there's no money - and then to deliver it"*.

Participants prioritised reforming funding mechanisms to provide substantial, long-term, reliable, and, critically, ring-fenced financial support specifically for climate adaptation could address this fundamental constraint. This funding needs to be flexible,

[110] Achieving environmental improvement and responding to climate change: enablers for success

covering the full spectrum of adaptation activities, including initial risk assessments, detailed planning, project delivery (both capital and revenue), ongoing monitoring, dedicated staffing, and capacity building. The call for *"Flexible funding streams. Funding for design stage. Most relates to capital works"* highlights the need to move beyond a purely capital-centric approach.

The competitive, short-term nature of current funding models can be counterproductive to building long-term resilience. Adaptation necessitates sustained effort and strategic foresight over decades. Intermittent, project-based funding forces local authorities into a reactive cycle of bid-writing, discourages the retention of specialist staff (leading to a continual loss of expertise and institutional memory), and prevents the deep embedding of adaptation into core strategies and operational practices. This stop-start approach creates uncertainty, which is antithetical to the requirements of long-term climate resilience planning.

The strong demand for ring-fenced funding signals a pragmatic recognition of the intense pressures on local authority budgets. Without such protection, there is a significant risk that even if additional general funding were provided, it would be absorbed by immediate crises or existing statutory service demands, leaving adaptation continuously under-resourced. This reflects the reality that *"Local authorities might have responsibilities and powers but after years of funding pressures they do not have capacity to act. It is all they can do to deliver core statutory functions"*. The LGA consistently highlights that councils receive "no core funding for climate and nature action and are instead forced to compete for short-term pots of funding"[106].

3.4.1.3 Establishing clear legal and regulatory drivers

Alongside sustainable funding, local authority representatives voiced a strong call for the establishment of clear statutory duties compelling them to plan and act on climate adaptation, provided these duties are backed by adequate resources: *"Make adaptation a statutory duty… If statutory, it must be funded"*. Such legal mandates are seen as crucial for elevating the priority of adaptation within local authorities, ensuring it does not continually *"lose out"* to other pressing, often statutorily required, services. As articulated by workshop participants, *"Councils won't do anything unless a clear statutory duty exists"*.

The introduction of a statutory duty for adaptation would fundamentally alter the internal dynamics within local authorities in places where no equivalent duty currently exists, particularly in England. Scotland already has an explicit statutory adaptation duty on public bodies, including local authorities, under Section 44 of the Climate Change (Scotland) Act 2009, and Wales has a strong cross-cutting statutory framework for long-term resilience through the Well-being of Future Generations (Wales) Act 2015.[111] A statutory requirement would provide officers championing adaptation with a stronger mandate when advocating for resources, policy changes, or the integration of resilience measures into wider council strategies. Furthermore, it would help to ensure

[111] Workshop responses were anonymised and could therefore not be analysed by nations.

a more consistent baseline of adaptation action across all local authorities, preventing a "postcode lottery" of climate resilience where only the most proactive or well-resourced authorities make significant progress. This aligns with recent research suggesting that a well-designed and appropriately resourced statutory responsibility could improve equity in burden-sharing among local authorities[112]. The LGA is currently exploring the potential role of statutory duties in enabling local climate action, acknowledging the need for greater clarity, certainty, and resources for councils.

Some local authority workshop participants called for a *"Wellbeing of Future Generations Act for the entire UK"*, drawing inspiration from the Welsh law. In Wales the Act already provides an overarching legal and ethical framework that compels all public bodies to consider the long-term consequences of their decisions (including inaction on climate change) and to act in ways that do not disadvantage future generations or exacerbate existing societal inequalities.

Coupled with statutory duties, there is a clear demand for mandatory adaptation reporting for local authorities, potentially through an enhanced and properly supported Adaptation Reporting Power (ARP) framework. Currently, adaptation reporting under ARP4 for local authorities in England is a voluntary pilot initiative with limited uptake. In contrast, public bodies in Scotland are subject to statutory climate change duties, including reporting requirements, which aim to improve transparency, consistency, and collaborative working. If mandatory ARP reporting were introduced for all UK local authorities, and critically, if it were accompanied by clear guidance, standardised methodologies, and support for capacity building, it could become a powerful tool. Beyond simple accountability, such a system could help identify common challenges, highlight capacity gaps, showcase good practice, and systematically track progress. This data would be invaluable for national bodies in targeting support more effectively and for local authorities themselves to benchmark their efforts and learn from peers.

3.4.1.4 Integrating climate resilience into planning, development, and regulatory frameworks

A critical area demanding systemic reform is the integration of climate resilience into the planning system, building regulations, and wider development and infrastructure approval processes. There is significant concern among local authorities that current design standards for buildings and infrastructure are not adequately accounting for future climate change, thereby *"building in risk across all aspects of the built environment and infrastructure"*. This leads to new developments that may not be resilient to future climate impacts, creating legacy issues and future costs for local authorities, businesses and communities to manage. A key call from local authority workshop participants was to *"Future proof the building regulation, ensuring new homes are built for climate change"*, a sentiment mentioned multiple times.

National planning policy frameworks must be significantly strengthened to provide local authorities with clearer and more robust powers to demand high standards of climate

[112] How could it be our responsibility?" The equity of Local Authority climate action in England

adaptation in new developments and infrastructure projects. This includes ensuring that Local Plans can move beyond generic policy statements to incorporate specific, place-based requirements for resilience, such as mandatory sustainable drainage systems (SuDS), urban greening factors, cool building design, and flood-resilient construction techniques. While current government working papers on planning reform emphasise speeding up build-out and streamlining processes[113], they include limited explicit and comprehensive integration of climate adaptation and resilience imperatives within these proposals. This risks creating future liabilities and maladaptation, which could lead to costly future "lock-in" of vulnerability[115].

However, effective integration of adaptation into planning requires not only national policy changes but also enhanced capacity, ecological literacy, and technical expertise within local authority planning departments themselves. Planners need the skills to interpret local climate risk data, understand the benefits and technical requirements of solutions like SuDS and green infrastructure, and negotiate effectively with developers to achieve higher resilience standards. This links back to the broader need for sustained investment in skills and capacity (as discussed in *3.4.2.3 Investing in skills, knowledge, and dedicated adaptation capacity*).

3.4.1.5 Improving national-local coordination and practical support systems (data, tools, guidance, training)

Addressing the adaptation challenge requires coordination, both horizontally *within* national government and vertically *between* national and local tiers. Local authority practitioners highlighted the negative impact of departmental silos at the national level, noting, for example, that it is difficult to *"Join the dots between adaptation and Net Zero at national level ; Adaptation is DEFRA-led Net Zero is DESNZ led… silos and not joined up actions"*. Such fragmentation at the national level creates conflicting signals, inefficiencies, and increased administrative burdens for local authorities, who are tasked with delivering holistic, place-based solutions. The CCC has consistently recommended improved coordination across government, urging that adaptation efforts be better linked with wider resilience planning to ensure adaptation becomes a true cross-government priority[3]. Similarly, the NAO has called for effective arrangements to coordinate across government departments and to ensure robust joint working with local government, noting that current central government work is often characterised as siloed[110].

During workshops, local authority officers highlighted that beyond strategic coordination, local authorities also require significantly enhanced practical support systems. Support they highlighted includes:

- **Accessible training:** Comprehensive and ongoing training programs for both local authority staff and elected members are essential to build *"Climate literacy across all sectors"* and develop specific adaptation skills in areas such as risk

[113] Planning Reform Working Paper: Speeding Up Build Out

assessment, economic appraisal of adaptation options, and community engagement.

- **Clear guidance and good practice:** Local authorities need *"clear and concise guidance"* from national bodies, including practical, worked examples of good practice, particularly on how to identify and articulate the co-benefits of adaptation actions.
- **Accessible data and tools:** While resources such as the Local Authority Climate Service provide valuable local climate projections and data, there is a need for additional access to this type of cross border data. National coordination is needed for *"data provision, procurement etc where local authorities all have the same needs"*. There are also persistent challenges with *"Lack of data sharing by infrastructure providers,"* which is a significant barrier to understanding cascading risks.
- **Support for business case development:** Specific guidance on quantifying the costs of inaction and the economic benefits of adaptation, including *"Guidance on costs avoided from adaptation"*, would help local authorities make stronger business cases for investment.
- **Knowledge sharing platforms:** The establishment of a *"what works centre' for adaptation* or similar national/regional hubs could facilitate the sharing of best practices, innovative solutions, and peer-to-peer learning among local authorities.

3.4.2 What can be improved at the local government level?

While national government has a pivotal role in creating an enabling environment, local authorities themselves are critical agents in driving forward climate adaptation. Their unique understanding of local contexts, vulnerabilities, local businesses and community needs positions them to design and deliver tailored resilience solutions. However, to effectively fulfil this role, local authorities must proactively enhance their internal capacities, foster collaborative approaches, and innovate in how they plan and resource adaptation. This section explores key strategies that local authorities can adopt, with appropriate support, to overcome existing barriers.

3.4.2.1 Fostering internal leadership, accountability, and mainstreaming adaptation

A fundamental step for local authorities is to elevate climate adaptation from a peripheral concern to a genuine corporate priority, driven by robust internal leadership and clear accountability structures. Workshop participants emphasised the need for *"Setting corporate priority for adaptation"* and ensuring that Chief Executives and senior management, not just specialist officers, are visibly championing and are accountable for progress: *"Have Chief Execs have to give a report and not defer to officers"*. The success of mainstreaming adaptation (i.e. integrating it deeply into all council functions, policies, plans, strategies, decision-making processes, and risk registers) hinges on this top-level commitment. As suggested by local authority officers, this

involves actions such as *"Corporate Risk needs to incorporate adaptation better..."* and actively *"Breaking down silo working"* to ensure that adaptation underpins all local authority work.

Effective mainstreaming necessitates a cultural shift within local authorities, moving beyond a superficial compliance mindset to one where climate resilience is viewed as an indispensable element of all service delivery and strategic objectives. Simply adding adaptation to a risk register or policy document is insufficient if it does not fundamentally alter how decisions are made daily across diverse departments; local authorities must *"[not] just list [adaptation] as Corporate risk but act on it"*. True mainstreaming means adaptation considerations become as reflexive as financial probity or safeguarding, influencing everything from procurement and asset management to spatial planning and social care delivery. This requires sustained leadership, comprehensive staff training, and potentially adjustments to performance management frameworks to incentivise adaptation-aware decision-making. The success of such mainstreaming is heavily dependent on assigning clear accountability at senior officer and elected member levels, as this provides the necessary authority to overcome departmental inertia, secure resources, and drive cross-council collaboration.

Text Box 4: Effective mainstreaming in Sutton

Effective mainstreaming in Sutton

Following its declaration of a climate and ecological emergency in 2019, the London Borough of Sutton has worked to make climate action a shared responsibility across the entire council. To achieve this, the council created a "Climate Portfolio" to capture and oversee climate-related work across the organisation, ensuring the activity was not missed or confined to a single directorate. This approach is supported by mandatory Climate Impact Assessments (CIAs) for all committee reports and integral project documents. If a team believes a CIA is not needed, they must get agreement from the Climate Action and Emergency Planning Team. To support this, the council rolled out mandatory climate awareness training for all managers, which included education on how to use the CIA tool. The new structure gives a clear oversight of climate action, which helps to identify gaps and develop a better understanding of opportunities for working together. The CIAs make sure that projects consider climate adaptation from the beginning, and officers bidding for capital programme funding must show how their project supports the Environment Strategy and Climate Emergency Response Plan [114].

Best practice guidance, such as the Scottish Government's principles for integrating adaptation into policy areas[115] and the Local Partnerships Climate Adaptation Toolkit's

[114] London - Leading case studies in climate resilience leadership
[115] Implementing the second duty: adaptation - Climate change duties - draft statutory guidance for public bodies: consultation

5-step process[116] , can also provide valuable frameworks for local authorities to embed adaptation systematically.

3.4.2.2 Building and leveraging collaborative networks and strategic partnerships

Collaboration was identified by local authority workshop participants as a cornerstone of successful adaptation efforts, with *"Strong Collaboration and Effective Partnership Working"* cited as a key enabler for current successes. There is a clear recognition of the value of working with a diverse range of actors. Local authorities should therefore proactively seek to strengthen and expand their collaborative networks. This includes fostering better internal collaboration between council departments, working more closely with neighbouring local authorities (e.g., to *"Collaborate across regions"*), engaging in regional partnerships (such as Climate Ready Clyde, Climate Northern Ireland or the Yorkshire and Humber Climate Commission, noted positively in the workshop), and building strategic alliances with external stakeholders. These external partners include local community groups, businesses, academic institutions, and crucial infrastructure providers.

While local authorities acknowledge the importance of partnerships, moving from ad-hoc collaboration to sustained, strategic engagement requires dedicated resources, such as officer time for partnership management, and clear governance frameworks for joint working. Furthermore, mechanisms are needed to overcome institutional barriers, particularly the *"significant barrier"* of data sharing with key partners like infrastructure providers, which was highlighted by local authority officers as impeding comprehensive risk assessment and planning. The national government may need to intervene to facilitate or mandate such data sharing from critical infrastructure providers (for example water and electricity providers) to enable effective local and regional adaptation planning.

Effective regional collaboration is particularly vital for addressing transboundary climate risks (e.g. catchment-scale flooding, regional water scarcity, or landscape-scale biodiversity impacts), which transcend the administrative boundaries of individual local authorities and cannot be managed effectively in isolation. The local authority workshop highlighted both successful examples of regional partnerships and concerns about the *"lack of regional co-ordination on widespread climate impacts"*. This points to a need for more consistent and adequately resourced regional adaptation frameworks or bodies across the UK, potentially building on existing successful models, to coordinate efforts, pool resources, and develop integrated strategies for these shared risks. Local authorities can play a crucial convening and facilitating role in these local and regional adaptation actions. Successful examples, such as the Environment Agency's collaborative work using readiness assessment tools to improve partnership working in flood and coastal resilience[117], and London Borough Ealing's Climate

[116] Climate adaptation toolkit and risk generator

[117] Working together to adapt to a changing climate - Case study

Adaptation and Resilience Partnership Forum[118] , demonstrate the tangible benefits of structured, multi-stakeholder collaboration.

3.4.2.3 Investing in skills, knowledge, and dedicated adaptation capacity

The shortage of specialised skills and the lack of dedicated adaptation staff were identified as major constraints hindering local authority progress. Addressing this requires local authorities to make a strategic investment in building their internal capacity. This includes providing targeted training for staff across all relevant departments and for elected members, covering areas such as climate science literacy, climate risk assessment methodologies, adaptation planning techniques, the economic appraisal of adaptation options, and effective risk communication. The LGA has previously noted a strong appetite for climate adaptation literacy training[5], particularly for senior roles, and workshop participants called for *"Adaptation training for staff"* and efforts to *"Increase carbon literacy among staff"*.

Where feasible, local authorities should advocate for and create dedicated adaptation officer roles or establish small, specialist teams. The presence of an *"Adaptation Officer"* or *"Dedicated Adaptation prof"* was highlighted in the webinar as a key factor contributing to successful adaptation outcomes. If dedicated roles are not immediately possible, local authorities should ensure that adaptation responsibilities are clearly defined and integrated within existing job descriptions, particularly in relevant service areas like planning, emergency and resilience management, environmental health, and asset management, and that these roles are supported with adequate time and resources.

Furthermore, fostering a culture of knowledge sharing, both internally within the local authority and externally with other authorities, is crucial. This can help to avoid situations where *"many council officers are struggling on their own but hive brain would be effective"*. Mechanisms such as establishing internal communities of practice, participating in regional adaptation networks, or developing peer-to-peer mentoring schemes can facilitate the exchange of learning, good practice, and innovative solutions. It is important to recognise that investing in adaptation skills and knowledge is not a one-off activity but demands a continuous professional development approach, given the evolving nature of climate science, risk assessment techniques, and adaptation practices. The *"flurry of new tools!"* noted in the webinar is indicative of this dynamic field. However, even with enhanced training, the *"brain space"* issue highlighted previously (where staff are already operating at full capacity due to wider resource pressures) suggests that the ability to meaningfully engage with and apply new adaptation knowledge will be limited unless overall staffing levels are sufficient. This highlights the interconnectedness of capacity building with the fundamental need for adequate core funding for local government.

[118] London Borough of Ealing: Resilience & Adaptation Stakeholder Forum | LGA

3.4.2.4 Innovating in local funding and resource mobilisation

While substantial and sustained funding from national government is paramount (as discussed in *3.4.1.2 Reforming and ensuring sufficient funding mechanisms*), local authorities can also enhance their resilience by proactively exploring a diverse range of local funding and resource mobilisation strategies. Workshop participants urged local authorities to *"Get imaginative with alternative funding streams given the current lack of funding"*. Local authority case studies show that this could involve investigating mechanisms such as:

- **Public-Private Partnerships (PPPs):** Collaborating with private sector entities to co-fund and deliver adaptation projects, particularly where mutual benefits can be identified.
- **Philanthropic funding:** Engaging with charitable foundations and trusts that have an interest in climate resilience, environmental protection, or community well-being.
- **Crowdfunding and community investment:** Exploring platforms that allow local communities to directly invest in or contribute to specific adaptation initiatives, fostering local ownership and engagement.
- **Green bonds or municipal bonds:** Where powers and scale allow, issuing bonds to finance larger-scale resilience infrastructure projects.
- **Local climate levies or precepts:** Investigating the potential for small, dedicated local levies, if legislative frameworks permit, to create a consistent local funding stream for adaptation.
- **Developer contributions:** Maximising the use of Section 106 agreements or the Community Infrastructure Levy (CIL) to secure contributions towards green infrastructure and other resilience measures in new developments.

Text Box 5: The Wyre Natural Flood Management (NFM) Project

The Wyre Natural Flood Management (NFM) Project

To tackle increasing flood risk in the River Wyre catchment without relying solely on government grants, a pioneering "Green Finance" partnership was formed involving Wyre Council, the Environment Agency, United Utilities (private water company), and private investors (via Triodos Bank). Instead of hard engineering, the project uses nature-based solutions (such as planting 40 hectares of woodland and building "leaky dams") to slow water flow.

The innovation lies in its funding model, which treats flood reduction as a service. A new legal entity (a Community Interest Company) was established to manage the project. It secured £850,000 in upfront private investment to pay for the works. This loan is repaid over 9 years by selling the "ecosystem services" (reduced flood risk) to a group of buyers: the Council, the Environment Agency, and United Utilities[119].

[119] Green Finance Institute - The Wyre Catchment Natural Flood Management Project

A critical element in attracting diverse funding sources, particularly from the private sector or through innovative financial instruments, is the ability to develop robust business cases for adaptation projects. This requires local authorities to move beyond qualitative arguments to quantify the benefits of adaptation, including the often-significant co-benefits related to improved public health, enhanced biodiversity, increased amenity value of green spaces, and local economic development. As suggested by a local authority officer, developing *"Business cases, with Cost-benefit analysis of different adaptation options in-house..."* is key (see *3.2.5.3 Difficulties in quantifying benefits and the cost of inaction*).

Successfully attracting private finance for local adaptation often depends on the ability to clearly demonstrate and, where possible, monetise these co-benefits, as purely adaptation-focused benefits (such as avoided future losses) can be challenging to quantify in traditional return-on-investment terms. If adaptation projects are designed to deliver tangible co-benefits that possess market value or demonstrably reduce other ongoing costs, they become significantly more attractive to a wider range of investors. This necessitates a shift in how adaptation projects are framed and valued, moving towards a more holistic assessment of their contributions to multiple local objectives. The COP26 Universities Network briefing highlighted that the financial value of co-benefits can often equal or exceed the costs of climate mitigation and adaptation actions themselves[120]. However, developing these innovative local finance approaches requires local authorities to build new skillsets in financial structuring, partnership development with the private sector, and articulating the investment case for resilience beyond traditional grant applications. This points to a need for capacity building in financial innovation, potentially supported by national bodies or specialist advisory services.

3.4.3 Cross-cutting considerations for national and local government

Beyond actions targeted specifically at national or local government capacities, overcoming the challenges to local authority climate adaptation requires broader systemic changes. These include fundamental reforms to how resilience is integrated into the development process, a steadfast commitment to ensuring adaptation outcomes are fair and equitable for all communities, and a concerted effort to cultivate public awareness and support for adaptation through effective communication and engagement.

3.4.3.1 Considering vulnerabilities to climate risks of individuals, groups and communities

Climate change impacts do not affect all members of society equally; existing social, economic, and health inequalities often mean that vulnerable and marginalised communities bear a disproportionate burden of climate risks[121]. Local authority officers

[120] CoBenefits of Climate-Change Mitigation and Adaptation Actions
[121] Technical-Report-The-Third-Climate-Change-Risk-Assessment

at the workshops highlighted that national and local policies should explicitly *"Recognise and account for disproportionate impacts"* and actively support a *"Just transition"* that ensures the benefits of adaptation are shared fairly and that no communities are left behind. The Scottish Government's statutory guidance for public bodies[109] provides a useful model, emphasising the need to reduce inequalities, focus on socially just outcomes, understand the concept of intersectionality (where multiple forms of disadvantage compound vulnerability), and collaborate with community groups[115]. A genuine consideration of climate vulnerabilities in adaptation requires considerations into all stages of the adaptation cycle: from initial risk assessment and vulnerability mapping, through the appraisal and selection of adaptation options, to implementation and ongoing monitoring and evaluation. This implies a need for equity impact assessments to become a standard component of adaptation planning.

An example of a practical resource to support this is recent guidance developed by Sensing Climate, in collaboration with the Bristol Climate and Nature Partnership, which helps local authorities consider how climate impacts and climate action can affect disabled people[122]. The guidance comprises a set of short, accessible thematic briefs for council officers, highlighting how risks and policies relating to areas such as housing, energy, transport, nature and emergency preparedness may create or exacerbate vulnerabilities if inclusivity is not actively considered.

3.4.3.2 Cultivating community engagement, public awareness, and behavioural shifts through co-benefits

A significant challenge highlighted by local authorities is the often low level of public understanding and awareness regarding climate adaptation, with many people lacking the "headspace" to engage with what can seem like distant or abstract risks. To overcome this, both national government and local authorities need to significantly improve how they engage with and communicate adaptation to the public. Workshop participants highlighted that local authorities have a key role to *"Educate their communities and inspire action"* and to *"Communicate better with communities. Using language that is meaningful and understood"*.

Workshop participants highlighted that a particularly effective strategy for enhancing engagement and building support is to consistently *"Push the co-benefits"* of adaptation actions. Adaptation measures often deliver multiple ancillary benefits beyond direct risk reduction, such as improved public health (e.g., from urban greening reducing heat stress and improving air quality), enhanced biodiversity, creation of new green spaces for recreation, local economic development (e.g., through green jobs), and reduced energy costs (e.g., from well-insulated, passively cooled buildings). Highlighting these tangible, often near-term, co-benefits can make adaptation more relatable, appealing, and politically palatable, thereby fostering greater public support and encouraging positive behavioural shifts[120]. Communicating co-benefits is not merely a public relations exercise; it is a strategic approach to overcoming the *"prioritisation gap"* by

[122] New guidance for local authorities — Sensing Climate

aligning adaptation with other, often more immediate, local priorities and community values.

National public information campaigns can play a role in raising baseline awareness, while local authorities should focus on tailored local community engagement initiatives. This involves working collaboratively *with* communities to identify their specific place, neighbourhood and climate-related priorities and to co-design contextually appropriate solutions.

Text Box 6: Working together to adapt to a changing climate - flood and coast

Environment Agency: Working together to adapt to a changing climate - flood and coast

The Environment Agency's work on collaborative flood resilience planning which successfully engaged a broad cross-section of the community in two pilot locations in Croydon and Norfolk, demonstrates the power of such participatory approaches. Meaningful community engagement in adaptation extends beyond simple information provision; it involves empowering communities to participate actively in decision-making processes and to take ownership of local resilience efforts. This not only leads to more sustainable and contextually appropriate solutions by incorporating local knowledge but also strengthens social capital and gives a voice to those most affected by climate impacts[123].

[123] Working together to adapt to a changing climate - flood and coast

Chapter 4: What actions can local authorities take?

4.1 What needs to be done at a local level?

This chapter describes the adaptation systems and sub-systems (e.g. Land, Food Security, Built Environment and Communities etc.) in the UK and the role that local authorities play in ensuring they are integral to national resilience. In some systems, local authorities stand at the centre of this adaptive effort, wielding significant influence over land use, planning, infrastructure, and community well-being. In some systems, local authority roles are more facilitatory and enabling.

Local authorities shape climate adaptation through several distinct spheres of influence:

- **direct control** over their own assets and services
- **procurement and commissioning** that embed resilience requirements into supply chains and services
- **place shaping** through their planning, regulatory and spatial decision-making powers and regeneration or landscape-based activities
- **showcasing** of innovative or exemplary adaptation projects
- **partnerships** with regional bodies, infrastructure operators, businesses and community and voluntary sector organisations, communities, and
- **communications and engagement** that builds awareness, informs the design of solutions and supports behaviour change.

Across Chapter 4, these spheres are used to structure the practical steps local authorities can take within each system, illustrating how councils can influence adaptation both directly and indirectly.

4.1.1 Overarching principles for local authority action in adaptation

To effectively address the complex challenges of adaptation, local authority actions should be guided by several overarching principles:

- **Integrated approach:** Climate adaptation must be systematically embedded within all relevant local authority policies, plans, and decision-making processes. This includes Local Plans, Local Nature Recovery Strategies

(LNRSs)[124] in England (and equivalent strategic nature recovery initiatives in Scotland, Wales, and Northern Ireland), Green Infrastructure Strategies, flood risk management plans, and economic development strategies. This ensures that adaptation is not an isolated activity but a core consideration in shaping local places.

- **Evidence-based decision making:** Adaptation planning and interventions should be informed by the best available scientific evidence, including national climate projections (e.g., UKCP18), tools like the Local Authority Climate Service (LACS)[125], national and local Climate Change Risk Assessments (CCRAs), and locally gathered data and intelligence on vulnerabilities and impacts.
- **Considering the wider benefits of nature-based solutions (NbS):** Local authorities should assess nature-based solutions alongside other options and make sure their broader benefits are fully reflected in business cases for adaptation. These benefits can include improved biodiversity, better water management, carbon storage, and gains for community health and well-being.
- **Partnership working:** Effective land adaptation requires collaboration across a wide spectrum of stakeholders. Local authorities should proactively build and maintain partnerships with government agencies (e.g., Environment Agency, Natural England, Forestry Commission, SEPA, NRW, DAERA), neighbouring local authorities, businesses, landowners, academic institutions, voluntary sector organisations, and local community groups.
- **Community and business engagement:** Local authorities should actively involve, engage, and communicate with local communities and stakeholders. This includes raising awareness of local climate risks and adaptation options, translating national targets into local relevance, and co-designing and co-delivering local solutions that reflect community and business needs and values. This should actively include marginalised groups and communities at the earliest stages to ensure that they shape solutions for themselves.
- **Adaptive management:** Adaptation is an ongoing process, not a one-off fix. Local authorities need to implement robust monitoring and evaluation (M&E) frameworks to assess the effectiveness of their adaptation actions, learn from experience, and adjust strategies as new climate information emerges, risks evolve, and societal priorities change.

4.1.2 The role of local authorities in large adaptation projects

Flood and coastal erosion risk management schemes are mainly funded nationally, with local contributions and investments encouraged or required depending on the size of

[124] Adaptation considerations are part already included in statutory guidance on Local Plans and LNRSs.
[125] Local Authority | The Met Office climate data portal

the investment. These cover a range of interventions to manage the range of flood risks. Local authorities have a key role in most schemes, and are expected to play a greater role as more surface water flood risks are tackled, given that surface water flooding is a rapidly increasing risk.

In England, funding is made available on five yearly cycles and the most recent flood and coastal erosion risk management funding policy guidance has been published in April 2026. The Environment Agency is the conduit for this funding. Funding prioritises areas with the greatest risk and projects that provide high value for money, with a clear focus on ensuring deprived communities receive a fair share (at least 20% of resources) and that funding for natural flood management is increased. This new funding approach tackles the previously identified problem that smaller and natural schemes were hard to fund compared to larger engineering projects.

The majority of main river flood schemes across the UK are led, and often maintained by national agencies, namely, the Environment Agency (EA) in England, Natural Resources Wales (NRW) in Wales, the Scottish Environment Protection Agency (SEPA) in Scotland and the Department for Infrastructure (DfI Rivers) in Northern Ireland. Coastal flooding schemes are usually led by the host coastal local authority. Local authorities, water companies or internal drainage boards lead schemes on smaller water courses. Non-governmental organisations, charities and landowners also lead natural flood management schemes. In all cases, partnership working is key and the EA will work very closely with the local authority and vice versa regardless of which organisation is leading the scheme.

Local authorities play a range of roles in flood and coastal erosion risk management:

Strategic partnership and programme shaping: Local authorities contribute local knowledge, shape priorities, and help align national programmes with community needs – but the exact nature of this strategic partnership working with national agencies differs by nation.

- In England local authorities are members of Regional Flood and Coastal Committees (RFCCs), which help set priorities, shape investment programmes and ensure schemes reflect local needs[126].
- In Scotland and Wales this programme shaping often happens through local flood risk management plans.
- In Northern Ireland the partnership between councils and the relevant department is less formalised.

Developing business cases, co-funding and unlocking finance: Major schemes of up to £3m are nationally funded, but for those over £3m (in England) 90% funding is available, with local authorities and other partners like water companies or internal drainage boards or private sector and charities contributing the remaining funds.

[126] Regional Flood and Coastal Committees (RFCCs) - GOV.UK

Schemes are often developed by the local authority which must identify, develop and plan the scheme developing a business case for it:

- In England the Environment Agency allocates national Flood and Coastal Erosion Risk Management (FCERM) funding from Defra which funds the EA, local authorities, water companies and internal drainage boards to deliver schemes to tackle coastal erosion and flooding from rivers, sea, surface water and ground water. Funding up to £3m schemes is 100% funded through this, and over £3m up to 90% with investment from local authorities and other investment sources[127].
- In Wales, large schemes are primarily funded through Welsh Government capital grants administered via Natural Resources Wales, with local authorities contributing match funding.
- Scottish Government provides the majority of funding for major flood-protection schemes, while local authorities deliver and procure the schemes themselves, supported by SEPA's strategic guidance. This gives councils a larger direct delivery role than in England or Wales.
- In Northern Ireland, DfI Rivers funds and delivers most major flood-risk infrastructure, with local councils playing only a limited role in financing or scheme delivery, reflecting the more centralised governance structure.

Procurement and scheme design: local authorities that are leading schemes will lead the development of the business case and procurement, working closely with internal teams, the Environment Agency, or national equivalent, and procure the design, build and maintenance of schemes.

Planning powers, land assembly and statutory consents: Across nations local authorities determine schemes through the planning process, providing or securing land access, coordinating highways permits, aligning schemes with Local Plans, nature recovery and regeneration plans, and ensuring environmental health and heritage requirements are met.

Coordinating local infrastructure and community impacts: Across all UK nations, local authorities play a central role in coordinating the design and understanding and mitigating the impacts of major adaptation projects. This includes – managing or facilitating community and business engagement, anticipating infrastructure disruption, and ensuring schemes integrate with transport, housing, public services and local businesses. This role is critical during the inception through the design and during delivery, and can last decades.

4.1.3 The role of local authorities in Local Resilience Forums

A Local Resilience Forum (LRF) coordinates emergency planning and response in a local area. Under the Civil Contingencies Act 2004, these forums unite different

[127] Flood and coastal erosion risk management funding policy guidance - GOV.UK April 2026

organisations. They bring together Category 1 responders, such as local councils and emergency services, with Category 2 responders, such as utility companies. They work together to prepare for major incidents, respond effectively, and support community recovery.

Local authorities act as Category 1 responders within these forums. They often lead or co-chair the group. Local authorities provide essential local knowledge and coordinate support for vulnerable people. During an extreme weather event, they set up emergency shelters and manage public information. After the immediate danger passes, local authorities lead the long-term community recovery work.

LRFs are important for local climate adaptation because they manage the immediate impacts of extreme weather. When floods, storms, or heatwaves occur, the LRF ensures that different agencies share information and resources. This joint planning helps communities recover faster from climate shocks. By identifying local risks early, LRFs also help local authorities plan long-term changes to protect vulnerable people and services[128].

The structure of these forums varies across the four nations of the UK.

- **England and Wales:** These nations use Local Resilience Forums, which usually align with police force areas.
- **Scotland:** Scotland uses Regional Resilience Partnerships (RRPs) to coordinate emergency planning across local council boundaries[129].
- **Northern Ireland:** Northern Ireland operates under the Northern Ireland Civil Contingencies Framework. Because local councils in Northern Ireland have fewer statutory powers, central government departments take a larger role in emergency response[130].

[128] The_role_of_Local_Resilience_Forums-_A_reference_document
[129] Resilience Arrangements - Civil emergency whole system preparedness: 2025 report - gov.scot
[130] Northern Ireland Civil Contingencies Framework (NICCF)

4.2 Land

What is the land system? The land system is made up of **coastal margins, farmed land, woodlands, freshwater environments, and uplands**, representing the UK's key terrestrial and aquatic ecosystems and landscapes that together support biodiversity, carbon storage, food production, water resources, and other essential ecosystem services[131,132].

4.2.1 What is the role of local authorities in adapting the land system?

4.2.1.1 Adapting coastal margins: local authority interventions and strategies

What are coastal margins? Coastal margins are the dynamic interfaces between terrestrial and marine environments, encompassing beaches, cliffs, saltmarshes, estuaries, and other coastal landforms.

What are the key climate risks? Key climate risks are sea-level rise, increased storminess, and coastal erosion which threaten habitats such as saltmarshes, dunes, mudflats, and estuaries, leading to habitat loss and increased flood exposure[133].

What do resilient coastal margins look like? Effective adaptation of coastal margins may include strategic managed realignment in some areas, allowing shorelines to move more naturally, alongside the maintenance or enhancement of flood defences and nature-based solutions, such as the restoration and creation of saltmarshes, dune systems, and other coastal habitats. Generally, healthy and functioning coastal ecosystems are also more resilient to climate impacts[134135].

What actions can local authorities take to adapt coastal margins?

Direct control

- **Management of local authority-owned coastal land:** Local authorities often own significant parcels of coastal land, including public parks, amenity areas, and designated nature reserves. This land can be managed proactively to enhance natural coastal defences. For example, local authorities can initiate or support projects to restore or create habitats like saltmarshes, sand dunes, or coastal woodlands, which can buffer against storm impacts and erosion.
- **Maintenance and creation of coastal habitats:** Councils can manage existing habitats, such as mudflats and shingle beaches, to ensure they remain healthy to increase resilience and as effective as natural defences.
- Procurement and commissioning and commercialisation

[131] Carbon Storage and Sequestration by Habitat 2021 - NERR094
[132] Upland habitat descriptions: UK Terrestrial & Freshwater Habitat Types
[133] CCRA3 Briefing Flooding and Coastal Change
[134] Impacts of climate change on disadvantaged UK coastal communities
[135] Environment Agency – National Flood and Coastal Erosion Risk Management Strategy for England

- **Climate-resilient standards for coastal projects:** When commissioning new coastal defence schemes, infrastructure upgrades, or regeneration projects, local authorities must specify climate-resilient design standards that account for future sea-level rise and increased storm intensity throughout the planned lifetime of the asset.
- **Commissioning services that support marine adaptation:** local authorities can commission a range of specialist services to support their marine adaptation efforts. This could include commissioning detailed local climate impact assessments for their coastal areas, feasibility studies for habitat restoration projects (such as seagrass planting or saltmarsh creation), the development of sustainable tourism strategies that are resilient to climate change, or research into innovative adaptation technologies.
- **Partnerships for innovative solutions:** local authorities can explore commercial partnerships or joint ventures to develop and deploy innovative coastal adaptation solutions. This could include, for example, investing in eco-tourism initiatives based on restored coastal habitats like saltmarshes or seagrass beds, which also provide natural coastal protection benefits.

Place shaping

- **Development and implementation of Shoreline Management Plans (SMPs):** Local authorities, often in partnership with the Environment Agency and other stakeholders, working in Coastal Groups, lead on the development and implementation of SMPs. These plans set out the strategic approach to managing coastal flood and erosion risk over the short, medium, and long term, and must be regularly reviewed and updated to incorporate the latest climate projections[136].
- **Facilitating managed realignment:** Local authorities can proactively identify and facilitate opportunities for managed realignment, where the shoreline is allowed to retreat or advance in a controlled manner. This can create or restore valuable intertidal habitats (e.g., saltmarshes, mudflats) that act as natural buffers against coastal erosion and flooding, while also enhancing biodiversity and carbon sequestration[137].

Showcasing

- **Developing and promoting innovative pilot projects:** Local authorities can initiate or support pilot projects that test novel approaches to marine adaptation. This could include trialling new types of resilient coastal defence materials or designs, community-led habitat restoration techniques (as seen

[136] Shoreline management plans
[137] Impacts of climate change on disadvantaged UK coastal communities

with Seawilding in Scotland[138]), or exploring the feasibility of new climate-resilient aquaculture species. The government's Flood and Coastal Resilience Innovation Programme[139] is designed to support such innovative actions.

Partnerships

- **Collaboration with national agencies:** Working closely with the Environment Agency (in England), Natural Resources Wales, Scottish Environment Protection Agency (SEPA), and the Department of Agriculture, Environment and Rural Affairs (DAERA) in Northern Ireland on strategic coastal management, flood defence investment programmes, and habitat restoration projects.
- **Cross-boundary cooperation:** Collaborating with neighbouring local authorities on coastal issues that transcend administrative boundaries, such as sediment transport management or the development of regional coastal adaptation strategies.
- **Supporting community and NGO collaboration:** Community groups, environmental NGOs, and volunteer networks often have valuable local knowledge and enthusiasm. Local authorities can partner with these groups on a wide range of initiatives, including local habitat restoration projects (e.g., community-led seagrass planting), citizen science monitoring of coastal change or marine biodiversity, local awareness-raising campaigns, and practical conservation work.
- **Participation in regional coastal groups:** Active participation in regional coastal groups and partnerships (e.g., Coastal Groups in England) provides a platform for local authorities to engage in strategic discussions, share best practices, influence regional policy, and collaborate on larger-scale initiatives.

Involving, engaging & communicating

- **Public education to prevent avoidable coastal damage:** Local authorities can provide information to explain to residents, businesses, and visitors how their actions can worsen coastal erosion, and give clear guidance on what to avoid. For example, advising people not to climb on sandbanks, dunes, or fragile coastal features. Using simple language and clear visuals to show how everyday behaviour can help protect the coastline and reduce future risks.
- **Facilitating community participation in adaptation planning:** Engaging communities in meaningful dialogue about the future of their coastline and involving them in the decision-making process for selecting and implementing adaptation pathways. This is particularly important when considering potentially contentious options like managed realignment.

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[138] Supporting marine restoration and communities to take action | Esmée Fairbairn Foundation
[139] Flood and coastal innovation programmes

Nation-specific considerations:

- **England:** Local authorities operate within the framework of the Environment Agency's National Flood and Coastal Erosion Risk Management Strategy[140] . The EA holds a strategic overview role for flood and coastal erosion risk management (FCERM) and oversees SMPs. The development of Local Nature Recovery Strategies (LNRSs)[141] is important for identifying opportunities for coastal habitat creation and restoration as part of adaptation.
- **Scotland:** Adaptation Scotland, NatureScot and SEPA provide extensive resources and support for LAs[142]. The Dynamic Coast project offers key evidence on coastal change to inform planning[143] and have published specific coastal change adaptation planning guidance[144].
- **Wales:** The Welsh Government's Climate Adaptation Strategy for Wales and specific policies like TAN 15 (Development, Flooding and Coastal Erosion)[145] guide LA actions. There is a strong emphasis on Shoreline Management Plans and the use of Nature-based Solutions for coastal defence. Natural Resources Wales provides guidance and support[146].
- **Northern Ireland:** The Northern Ireland Climate Change Adaptation Programme sets out objectives for achieving resilient coastal communities and protecting coastal habitats. Local authorities are involved through their Local Development Plans and participation in coastal management initiatives, working with DAERA and DfI.

4.2.1.2 Adapting farmland: local authority interventions and strategies

What is farmed land? Farmed land refers to the arable fields, pasture, and horticultural areas that make up around 72% of the UK's land area and support food production, carbon storage, and rural livelihoods[147].

What are the key climate risks? Under a changing climate, drought, heat stress, soil erosion, flooding, and increased pressure from pests and diseases undermine crop yields, livestock productivity, and soil health[148].

What does resilient farmed land look like? Effective adaptation for farmed land will require the adoption of sustainable land management practices, including soil conservation, diversification of crops and livestock, and efficient on-farm water management. It will also require enhancement of on-farm biodiversity and ecosystem

[140] National Flood and Coastal Erosion Risk Management Strategy for England
[141] Local nature recovery strategies
[142] Public sector - Adaptation Scotland
[143] Dynamic Coast - Coastal Change Adaptation
[144] Coastal Change Adaptation Plan Guidance
[145] Technical advice note (TAN) 15: development, flooding and coastal erosion
[146] Natural Resources Wales / Shoreline Management Plans
[147] Climate change and land: opportunities and challenges for the UK
[148] Technical Report The Third Climate Change Risk Assessment

services through the integration of hedgerows, field margins, ponds and woodland.[149,150,151,152 153,154,]

What actions can local authorities take to adapt farmed land? Local authorities can influence the resilience of farmland through various mechanisms, from managing their own agricultural estates to shaping local planning policies and fostering partnerships. Some of these actions also apply to the farming aspects in uplands.

Direct control

- **Management of local authority-owned agricultural land (e.g., county farms):** Local authorities can implement and showcase sustainable land management practices that enhance climate resilience. This could include improving soil health, adopting water-efficient farming techniques, enhancing on-farm biodiversity (e.g., through hedgerow management, creation of buffer strips), avoiding overgrazing and trialling climate-adapted crops or livestock.
- **Habitat creation and restoration on agricultural land:** Local authorities can use their own land to restore wetlands, floodplain meadows, species-rich grassland or agroforestry systems. These habitats improve resilience to flooding, drought and heat while supporting wildlife and soil health.

Procurement and commissioning & commercialisation

- **Sustainable procurement by council catering services:** Where feasible, local authorities can prioritise sourcing food for schools, care homes, and other council facilities from producers who employ sustainable and climate-resilient farming methods. This can help create a market for such produce.
- **Inclusion of resilience criteria in food procurement:** When contracting for food and agricultural products, local authorities can include criteria related to climate resilience.

Place shaping

- **Integration into Local Plans and rural strategies:** Local authorities can embed objectives for climate-resilient agriculture within Local Plans, rural development strategies, and food strategies. This includes policies that protect high-quality agricultural land from inappropriate development while also strategically identifying land for habitat creation or natural flood management where compatible with agricultural resilience[155].

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[149] Soil health in UK farming
[150] Climate change: Supporting farmers and growers - House of Lords Library
[151] Rainwater Harvesting on Farms
[152] Using integrated pest management to grow healthy crops and support nature – Farming
[153] Urgent need to enable more farmers and contractors to revive England's network of hedgerows | UK Centre for Ecology & Hydrology
[154] Land of Plenty: bringing nature back to life | WWF
[155] Climate change Guidance

- **Connecting habitat corridors across farmland:** Local authorities can support the creation of wildlife corridors through farmed landscapes, for example by linking hedgerows, rivers, wetlands and woodlands. This allows species to move in response to climate change and reduces habitat fragmentation.
- **Integration with Local Nature Recovery Strategies (LNRSs):** Local authorities can actively involve the agricultural sector in the development and delivery of LNRSs (in England) and similar nature recovery plans in the devolved nations, ensuring that agricultural land management contributes to wider biodiversity and ecosystem resilience goals[156].
- **Promoting landscape-scale environmental improvements:** Local authorities can promote wider projects by bringing landowners, farmers, and community groups together, helping them work across boundaries, and providing practical support. This may include coordinating catchment wide farming initiatives that reduce pollution and improve water quality, offering guidance through Local Nature Recovery Strategies, helping partners access funding, and using planning policies to encourage habitat creation and connectivity across multiple farms.

Showcasing

- **Innovation and piloting:** Local authorities can also support pilot projects for Community Supported Agriculture (CSA) schemes, which can create direct links between local producers and consumers, fostering resilience through shared risk and reward[157].
- **Demonstrating good practice:** Local authorities should systematically showcase successful local food adaptation projects and actively share the learning derived from these initiatives to encourage replication and scaling-up. An example that offers valuable insights include Birmingham City Council's 'Full of Beans' campaign, which promotes sustainable, plant-based protein consumption[158] .
- **Demonstration farms and pilot projects:** Partnering with local farms or agricultural colleges to establish demonstration sites or pilot projects showcasing innovative climate-resilient farming techniques, such as agroforestry systems, cover cropping for soil health, or the cultivation of novel or drought-tolerant crops.

Partnerships

- **Collaboration with agricultural and environmental bodies:** Local authorities can work closely with farming organisations to promote sustainable farming. These include the National Farmers' Union, National Farmers' Union Scotland,

[156] Empowering local climate action: Advice to government | Local Government Association
[157] communitysupportedagriculture.org.uk
[158] Birmingham City Council's Full of Beans Campaign | Local Government Association

National Farmers' Union Cymru, and the Ulster Farmers' Union. Councils can also collaborate with government agencies. Examples include Natural England, the Environment Agency, the Scottish Environment Protection Agency, NatureScot, Natural Resources Wales, and the Northern Ireland Environment Agency. Finally, local authorities can partner with water companies and conservation bodies.

- **Working with farmers and land managers:** Local authorities can work with farmers, landowners and tenant farmers to support climate-resilient land management that benefits both production and nature. This includes signposting funding, coordinating advice, and supporting landscape-scale initiatives.
- **Supporting farmer-led initiatives:** Local authorities can encourage and support farmer-led groups and networks focused on knowledge sharing, peer-to-peer learning, and collaborative action on climate adaptation.

Involving, engaging & communicating

- **Providing tailored information and advice:** Local authorities can offer or facilitate access to tailored information and advice for farmers on local climate risks relevant to their enterprises and practical adaptation options available to them.
- **Facilitating access to support for farmers:** Local authorities can signpost farmers to relevant grants (e.g., Environmental Land Management schemes in England), advice, and training opportunities for implementing on-farm adaptation measures. This includes support for improving soil health, water management infrastructure, crop diversification, and agroforestry.

Nation-specific considerations:

- **England:** The Environmental Land Management schemes[159] (including the Sustainable Farming Incentive, Countryside Stewardship, and Landscape Recovery) are key government mechanisms for funding farmers to deliver environmental outcomes, including climate adaptation. Local authorities can help farmers access and navigate these schemes.
- **Scotland:** The Agri-Environment Climate Scheme is the main funding mechanism for farmers[160]. It promotes land management practices that help adapt to climate change, manage flood risk, and improve water quality. Local authorities can support farmers to apply for this funding.
- **Wales:** The new Sustainable Farming Scheme is a key policy driver for agricultural adaptation and resilience[161].

[159] Environmental Land Management (ELM) update: how government will pay for land-based environment and climate goods and services
[160] Agri-Environment Climate Scheme
[161] Sustainable Farming Scheme: ready reckoner guide | GOV.WALES

- **Northern Ireland:** NICCAP includes objectives for a resilient agricultural sector. DAERA initiatives, such as the Soil Nutrient Health Scheme[162], support sustainable farming practices.

4.2.1.3 Adapting woodland: local authority interventions and strategies

What is woodland? Woodland refers to the UK's diverse tree-covered landscapes - including ancient semi-natural woodlands, commercial plantations, newly created woods, and urban tree areas - that together cover around 13% of the UK and provide vital biodiversity, carbon storage, and climate-resilience functions. [163]

What are the key climate risks? Under a changing climate, woodlands face growing threats from drought, wildfire, storms, pests, and diseases. [164,165]

What do resilient woodlands look like? Adapting UK woodlands will require the expansion and improved management of woodlands using climate-appropriate and diverse species, and habitat connectivity to strengthen resilience. Biosecurity measures (e.g. kit cleaning, transport wash-down and responsible plant sourcing) and active management (e.g. thinning, timing of operations, increasing tree diversity, using natural regeneration and careful establishment) of woodlands are required to prevent the new introduction and spread of emerging pests and diseases and to reduce vulnerability to wildfires and storm damage. [166,167,168,]

What actions can local authorities take to adapt woodlands? Local authorities have a significant role in ensuring existing woodlands are resilient and that new woodland creation contributes to climate adaptation and other ecosystem services. They can also support climate-resilient uplands.

Direct control

- **Management of local authority-owned woodlands:** Local authorities can implement climate-resilient management practices in council-owned woodlands. This includes actions like increasing species and structural diversity, favouring continuous cover forestry approaches where appropriate, actively managing pests and diseases, undertaking preventative measures against wildfire (e.g., creating firebreaks, managing fuel loads), and adapting harvesting operations to changing conditions.
- **Climate-resilient woodland creation on local authority land:** Local authorities can plant new woodlands on suitable local authority-owned land, prioritising

[162] Soil Nutrient Health Scheme | Agri-Food and Biosciences Institute
[163] Carbon Storage and Sequestration by Habitat 2021 - NERR094
[164] Climate change adaptation reporting fourth round: Forestry Commission
[165] Technical Report The Third Climate Change Risk Assessment
[166] Climate change impacts and adaptation in England's woodlands - Forest Research
[167] Selecting tree seeds for current and future climates in order to maintain productivity
[168] Climate change adaptation reporting fourth round: Forestry Commission

species and provenances that are expected to be resilient to future climate conditions and that deliver multiple benefits (e.g., carbon sequestration, flood mitigation, biodiversity, public access).

Procurement and commissioning & commercialisation

- **Sustainable timber procurement:** Local authorities can specify the use of sustainably managed and climate-resilient timber in council construction projects and other procurement activities. This can help to support markets for timber from well-managed woodlands.

Place shaping

- **Strategic woodland planning:** Local authorities can integrate objectives for resilient woodland creation and management into Local Tree and Woodland Strategies, Local Strategies, Local Plans, Local Nature Recovery Strategies (LNRSs), Green Infrastructure Strategies, and other relevant spatial plans. This involves identifying priority areas for woodland expansion to deliver multiple benefits, such as connecting existing habitats, mitigating flood risk, improving water quality, sequestering carbon, and providing recreational opportunities.
- **Connecting woodland habitat corridors:** Local authorities can support the creation and protection of woodland corridors that link isolated woods to other habitats such as rivers, wetlands, grasslands and urban greenspaces. This improves species movement and reduces fragmentation as climate conditions change.
- **Use of Tree Preservation Orders (TPOs):** Local authorities can employ TPOs to protect individual trees and areas of woodland that are of high amenity, biodiversity, or cultural value, and ensuring these are managed appropriately in the face of climate change[169].
- **Promoting 'Right Tree, Right Place':** Local authorities can champion the principle of planting the 'right tree in the right place'[170]. This involves careful consideration of site suitability (soil type, hydrology, aspect), future climate projections, and the potential impacts on other habitats and land uses. Critically, this includes avoiding tree planting on sensitive habitats such as priority peatlands or species-rich grasslands unless for specific, justified ecological reasons.

Showcasing

- **Demonstrating best practice:** Local authorities can use council-owned woodlands to demonstrate best practice in climate-resilient woodland

[169] Tree Preservation Orders and trees in conservation areas
[170] The Right Tree in the Right Place: Planning for Forestry and Woodlands

management, including innovative silvicultural systems, pest and disease management techniques, and wildfire prevention measures.

- **Pilot projects for innovation:** Local authorities can establish or support pilot projects for innovative woodland creation or management approaches, such as testing new tree species or provenances for climate suitability, or developing agroforestry systems on council-owned farmland.

Partnerships

- **Collaboration with forestry and conservation bodies:** Local authorities can work closely with the Forestry Commission, Natural England (and devolved equivalents like Scottish Forestry, Natural Resources Wales, and DAERA Forest Service), the Woodland Trust, private landowners, forestry businesses, and community woodland groups on strategic woodland creation, management, and resilience initiatives.
- **Supporting regional forestry initiatives:** Local authorities can participate in and support regional forestry partnerships and initiatives aimed at developing sustainable timber supply chains and promoting resilient woodland landscapes.

Involving, engaging & communicating

- **Advice and guidance for private woodland owners:** Local authorities can provide or signpost private woodland owners to advice, guidance, and grant opportunities for implementing climate-resilient management practices, including pest and disease control and species diversification.
- **Community involvement in woodland activities:** Local authorities can engage local communities in tree planting initiatives, woodland management volunteering, and educational activities related to woodlands and climate change (e.g., "Wee Forests" projects in Scotland[171]).
- **Raising awareness of woodland benefits and threats:** Local authorities can communicate the multiple benefits provided by woodlands and raising public awareness of the threats posed by climate change, pests, and diseases, and the importance of biosecurity.

Nation-specific considerations:

- **England:** The England Trees Action Plan[172] and associated targets for woodland creation guide action. England's new Land Use Framework (2026) provides a national, spatially coherent approach that directly strengthens woodland creation and management[173]. The Forestry Commission provides extensive guidance, grants (e.g., England Woodland Creation Offer - EWCO[174]), and

[171] Wee Forests: Part of the TinyForest Global Family | NatureScot
[172] England Trees Action Plan 2021 to 2024
[173] Land Use Framework - GOV.UK
[174] England Woodland Creation Offer

decision-support tools (e.g., Ecological Site Classification and Climate Matching Tool[175]).

- **Scotland:** Guided by the Scottish Forestry Strategy[176]. Forest Research case studies (e.g., managing for coastal change at Tentsmuir Forest, resilience planning at Queensberry Estate) provide practical examples of adaptation in Scottish forests[177].
- **Wales:** The "Woodlands for Wales" strategy[178] sets the direction. Natural Resources Wales provides guidance and manages the Welsh Government Woodland Estate[179]. The Sustainable Management Scheme has funded woodland creation and management projects with adaptation benefits[180].
- **Northern Ireland:** NICCAP includes objectives for resilient woodlands. DAERA Forest Service supports afforestation and sustainable woodland management. LA-led projects like MEA4Trees in Mid and East Antrim demonstrate local action in tree planting[181].

4.2.1.4 Adapting uplands: local authority interventions and strategies

What is an upland system? Upland systems are the high-ground areas of the UK. They include mountains, moorlands, heathlands, and peatlands. Uplands are important because they store huge amounts of carbon in peat soils, are important habitats and important for farming and culture. They also collect and filter much of the drinking water for the UK.

What are the key climate risks? Climate change brings hotter, drier summers and wetter winters to the uplands. Dry summers cause peatlands to dry out and crack. When peat dries, it releases stored carbon back into the atmosphere. Dry conditions also increase the risk of severe wildfires, which destroy habitats and threaten local communities. Longer-term increases in temperature will impact cool-adapted upland species and habitats. During winter, heavier rainfall washes away exposed soil. This soil erosion damages the land and pollutes water supplies. Fast-flowing water off degraded uplands also increases the risk of flooding in towns and villages downstream[182].

What do resilient upland systems look like? A resilient upland system holds water in the landscape. Healthy peatlands are wet and covered in native plants, such as sphagnum moss. This wetness prevents the peat from drying out and reduces the risk of wildfires. Land managers block old drainage ditches to keep the water on the hills for longer. This natural flood management slows the flow of water during heavy rain, which

[175] Selecting tree seeds for current and future climates in order to maintain productivity
[176] Scottish Forestry - Forestry Strategy
[177] New case studies demonstrate climate change adaptation measures at three Scottish sites - Forest Research
[178] Woodlands for Wales: strategy
[179] Natural Resources Wales / How we manage the Welsh Government Woodland Estate
[180] Sustainable Management Scheme
[181] Climate | Mid and East Antrim Borough Council
[182] Climate change and the British Uplands: evidence for decision-making

protects downstream areas from flooding. Resilient uplands also use sustainable grazing practices to protect the soil and support diverse wildlife[183]. A resilient upland system also increases the diversity and connectivity of upland habitats and assists movement of species where they cannot adapt to new conditions. Active wildfire management (such as fire breaks) reduces wildfire risk.

What actions can local authorities take to adapt uplands systems?

Direct control

- **Restoring peatlands:** Local authorities can restore peatlands on land they own. They can block old drainage ditches to keep the soil wet. This stops the peat from drying out and releasing carbon[184]. It also helps the land hold more water during heavy rain.
- **Managing wildfire risks:** Local authorities can manage the risk of wildfires on their upland estates. They can cut back dry vegetation to reduce the fuel available for fires. They can also create firebreaks to stop fires from spreading. During very hot and dry weather, they can temporarily close public access to protect the land.
- **Updating farm lease agreements:** Some local authorities own upland farms and lease them to tenant farmers. Local authorities can update these lease agreements to require resilient farming methods. For example, they can limit the number of sheep or cattle allowed on the land. This prevents overgrazing, protects the soil from erosion, and helps native plants grow.

Procurement and commissioning & commercialisation

- **Buying specialist services:** Local authorities can buy specialist services to restore peatlands and manage flood risks. They can include strict climate adaptation rules in these contracts. For example, they can require contractors to use methods that protect soil and water quality.
- **Attracting private investment:** Local authorities can explore new ways to pay for upland adaptation. They can work with private companies that want to invest in nature. For example, they can seek natural capital finance to fund water management projects or engage with robust schemes such as the Peatland Carbon Code to fund peatland restoration.

Place shaping

- **Using planning rules:** Local authorities can use their planning powers to protect upland areas. They can refuse planning permission for developments that damage peatlands or increase flood risks. This can be at the scale of local

[183] Towards a flourishing uplands: phase 1 - GOV.UK
[184] Peatland ACTION - Technical Compendium - Restoration - 4 Artificial drains | NatureScot

planning or spatial planning, for example through National Parks and protected landscapes.

- **Guiding nature recovery:** Councils can include upland protection in Local Nature Recovery Strategies. These strategies map out where to focus efforts to restore habitats and manage water across the region.
- **Managing public access:** Planners can design and manage public access to protect the landscape. They can route footpaths away from damaged peat to prevent soil erosion. They can also keep visitors away from areas with a high fire risk.

Showcasing

- **Creating demonstration sites:** Local authorities can use their own upland estates to show good management practices. They can set up demonstration sites to show how to restore peatlands or build natural flood defences.
- **Sharing success stories:** Local authorities can share the results of their upland projects. They can invite private landowners, farmers, and other councils to visit the sites. This shares knowledge and encourages others to adopt similar adaptation methods.

Partnerships

- **Working with protected landscape bodies:** Many upland areas sit within National Parks or National Landscapes, so local authorities can partner with these bodies to align adaptation plans. Together, they can manage visitor numbers and protect fragile habitats from climate impacts.
- **Partnering with water companies:** Uplands collect much of the drinking water for the United Kingdom, meaning councils can work with water companies on catchment management projects. These projects restore peat and slow water flow, which improves water quality and reduces downstream flooding.
- **Collaborating on wildfire prevention:** Local authorities can form partnerships with fire and rescue services, private landowners, and gamekeepers to create joint wildfire management plans. This ensures a quick and coordinated response when fires break out on dry moorlands.

Involving, engaging & communicating

- **Educating visitors about wildfire risks:** Local authorities can run public awareness campaigns for tourists visiting the uplands to explain the severe risks of using disposable barbecues. Clear signs and social media messages help prevent accidental fires on dry moorlands.
- **Promoting responsible access:** Councils can communicate with walkers and cyclists about protecting fragile peat soils by encouraging them to stay on marked paths. This prevents soil erosion and protects the plants that keep the uplands wet and resilient.

- **Communicating landscape changes:** Local authorities can support public understanding around how landscapes may need to change to support future resilience (for example, the need to reforest some of the bare hills in uplands).
- **Engaging local volunteers:** Local authorities can involve community groups in practical restoration work, such as organising volunteer days to plant sphagnum moss. This hands-on involvement builds local support and speeds up practical adaptation efforts in upland streams.

Nation-specific considerations:

- **England:** The England Peat Action Plan sets out the government vision to protect and restore peatlands[185]. The Environmental Land Management schemes provide the main funding for farmers to restore upland peat. The Nature for Climate Peatland Grant Scheme also provided funding to restore damaged peatlands[186]. Local authorities can help landowners access these funds to improve local resilience.
- **Scotland:** Peatland ACTION is the national programme to restore damaged peatlands in Scotland. NatureScot leads this partnership and offers funding and training to land managers[187]. The Scottish Government has committed funding to restore 250,000 hectares of peatland by 2030[188]. Local authorities can work with NatureScot to design and deliver local restoration projects.
- **Wales:** The National Peatland Action Programme is a five-year plan to restore Welsh peatlands[189]. Natural Resources Wales manages this programme and offers competitive grants to public and private landowners. Local authorities can apply for this funding to restore peatlands on their own estates. They can also work with partners to deliver wider landscape projects across the region.
- **Northern Ireland:** The Department of Agriculture, Environment and Rural Affairs published the Northern Ireland Peatland Strategy to 2040[190]. This strategy aims to conserve and restore peatlands to improve water quality and manage flood risks. Local councils play an important role in delivering this strategy[191].

4.2.1.5 Adapting freshwater systems: local authority interventions and strategies

What is a freshwater system? This sub-system includes freshwater ecosystems such as rivers, lakes, ponds, reservoirs, and wetlands (such as fens and marshes).

What are the key climate risks? Freshwater ecosystems face risks from altered rainfall patterns that increase both flooding and drought, changing flow patterns, increasing

[185] England Peat Action Plan - GOV.UK
[186] Nature for Climate Peatland Grant Scheme - GOV.UK
[187] Peatland ACTION | NatureScot
[188] Record levels of peatland restored - gov.scot
[189] Natural Resources Wales / The National Peatland Action Programme
[190] Northern Ireland Peatland Strategy to 2040 | Department of Agriculture, Environment and Rural Affairs
[191] Northern-ireland-peatland-strategy-to-2040-launched/

water temperatures, and declining water quality driven by climate change. These pressures exacerbate their vulnerability to invasive non-native species, pests and pathogens, which can outcompete native species and further degrade fragile freshwater habitats. [192, 193]

What do resilient freshwater systems look like? Effective adaptation requires restoring and reconnecting freshwater habitats such as rivers, floodplains, wetlands and ponds and allowing natural flow regimes. Good water quality is ensured by preventing pollution from agriculture, urban runoff or wastewater. Riverbanks and adjacent floodplains are well-vegetated with native species, providing essential shade (which helps to moderate water temperatures), bank stability, and habitats and associated wetlands (fens, marshes, wet woodlands) are in good condition. The spread of invasive species that threaten native biodiversity is prevented through effective management strategies where necessary. Levels of water abstraction for public supply, agriculture, and industry do not compromise the ecological health of freshwater ecosystems, particularly during periods of low flow and drought. [194,195]

What actions can local authorities take to adapt freshwater systems?

Direct control

- **Pollution prevention from local authority operations:** Local authorities can ensure that their activities, such as road maintenance (e.g., salt spreading, gully emptying), parks and open space management (e.g., pesticide/fertiliser use), and fleet management, are conducted in ways that minimise the risk of pollution to nearby freshwater systems. This helps freshwater systems cope better with climate shocks by keeping water cleaner, protecting habitats, and supporting the resilience of local rivers, streams, and wetlands.
- **Planting trees along riverbanks:** Local authorities can plant trees on riverbanks to provide shade, which helps cool water temperatures during hotter summers. Cooler water supports healthier freshwater habitats and reduces heat stress on fish and other species.
- **Improving drainage and connecting freshwater systems:** Local authorities can manage drainage on land they own, fix local drainage issues, and reconnect rivers, streams, wetlands, and ponds where possible. This helps slow water flow, reduces flood risk, supports habitats, and strengthens the overall resilience of the local freshwater system.

[192] CCRA3-Briefing-Freshwater-Habitats
[193] Technical Report The Third Climate Change Risk Assessment
[194] Freshwater habitat restoration POST-PN-0709
[195] Water supply resilience and climate change

Procurement and commissioning & commercialisation

- **Reduce impacts on freshwater systems:** Local authorities can require specific drainage features in council-commissioned works, that require materials and designs that reduce polluted run-off entering rivers and streams. They can also include procurement criteria that help slow water flow, improve water quality, and increase the overall resilience of local freshwater systems.

Place shaping

- **Water-sensitive planning policies:** Local Plans should support actions that keep water systems connected and able to cope with climate shocks. This includes improving drainage to slow and manage water flow, reducing polluted runoff from new developments, protecting and restoring links between rivers, streams, wetlands, and ponds, and encouraging planting along riverbanks to provide shade and keep water temperatures cooler.
- **Integration of water management into strategic plans:** Local authorities can ensure that water management, flood risk, and freshwater ecosystem health are fully integrated into Local Plans, LNRSs, River Basin Management Plans (RBMPs), and local flood risk management strategies.
- **Facilitating river restoration and wetland creation:** Local authorities can work with developers, landowners, and conservation bodies to identify opportunities for restoring natural river morphology, and creating or restoring wetland habitats as part of development schemes or dedicated environmental projects.

Showcasing

- **Exemplary connected freshwater systems:** Local authorities can showcase projects that keep water systems connected and better able to cope with climate shocks. This includes restoring links between rivers, streams, wetlands, and ponds and strengthens resilience.
- **Community-based freshwater projects:** Local authorities can showcase successful community-led initiatives focused on e.g. river restoration to inspire further local action.

Partnerships

- **Collaboration with water management bodies:** Local authorities can work in close partnership with the Environment Agency (and devolved equivalents), water companies, Internal Drainage Boards (where they exist), and Catchment Partnerships[196] to deliver integrated water management solutions that improve water quality, manage flood risk, ensure sustainable water resources, and restore freshwater habitats.

[196] Catchment Partnership Pages | Catchment Data Explorer

- **Tackling diffuse pollution:** Local authorities can support and participate in initiatives aimed at tackling diffuse pollution from both agricultural sources (e.g., nutrient and soil run-off) and urban sources (e.g., road run-off, misconnected drains).
- **Managing invasive species in freshwater:** Local authorities can collaborate with relevant agencies and local groups (e.g., angling clubs, conservation volunteers) on programmes to monitor, control, and prevent the spread of invasive non-native species (INNS) in rivers, lakes, and canals.

Involving, engaging & communicating

- **Public awareness campaigns:** Local authorities can raise awareness among residents, businesses, and schools about the importance of water conservation, and measures to prevent water pollution (e.g., proper disposal of fats, oils, and chemicals).
- **Supporting citizen science:** Local authorities can encourage and support citizen science projects that monitor local water quality, river health, rainfall patterns, or the presence of freshwater biodiversity (including INNS).
- **Community stewardship of water bodies:** Local authorities can engage local communities in the care and improvement of their local rivers, streams, ponds, and wetlands through volunteer activities, "friends of" groups, and educational programmes.

Nation-specific considerations:

- **England:** LLFA responsibilities are clearly defined. The Environment Agency leads on flood risk, water resources, and drought management. Catchment Based Approach (CaBA) partnerships are important for improving water quality and managing river flows. Water companies manage water supply and wastewater, and Ofwat regulates them.
- **Scotland:** SEPA leads on water management, flood risk, and water scarcity. River Basin Management Plans are in place[197], and local authorities have duties under the Flood Risk Management (Scotland) Act 2009.
- **Wales:** NRW is the principal body for water management, flood risk, and drought response[198]. The Welsh Government's Climate Adaptation Strategy and policies like TAN 15[199] guide local authorities actions. LLFAs have similar roles to those in England. The Sustainable Management Scheme funds projects that improve water quality and manage river flows.
- **Northern Ireland:** NICCAP includes objectives for resilient water bodies. It covers flood risk and water supply. DAERA and the Department for Infrastructure

[197] River basin management planning | Scottish Environment Protection Agency (SEPA)
[198] Roles and Responsibilities - Flooding | Rhondda Cynon Taf County Borough Council
[199] Technical advice note (TAN) 15: development, flooding and coastal erosion | GOV.WALES

(DfI Rivers) manage water quality and flow. Local authorities contribute through Local Development Plans (LDPs) and environmental health functions.

4.3 Sea

What is the sea system? The sea system covers the UK's marine environment beyond the coast, including offshore ecosystems, marine habitats, blue-carbon stores, and fisheries and aquaculture sectors.

What are the key climate risks? Rising sea temperatures, ocean acidification, and changes in salinity and nutrient availability can damage seabed habitats, disrupt food webs, and reduce the resilience of offshore species.

More frequent and intense rainfall events can cause flooding and coastal erosion, leading to the leaching of pollutants, nutrients, and sediments from land into the marine environment, degrading water quality, harming fish stocks, and impacting the viability of aquaculture business operations.

The degradation of the marine ecosystem risks natural carbon stores which can release historically stored carbon back into the atmosphere and can reduce future carbon storage. [200,201,202,203,204]

What does a resilient sea look like? A climate-resilient sea is defined by healthy, diverse, and well-connected marine habitats that can withstand and recover from climate pressures. It is characterised by reduced pollution and nutrient inputs, effectively managed Marine Protected Areas, and fisheries and aquaculture sectors that operate sustainably. Protecting and restoring blue-carbon habitats such as seagrass beds, saltmarshes, and marine sediments is essential to safeguard long-term carbon storage while supporting biodiversity. [205,206]

4.3.1 What is the role of local authorities in adapting the sea system?

Local authorities have very limited control over adaptation in the sea system. Unlike on land or along the coast, local authorities do not manage offshore habitats or operate marine infrastructure in open waters, and only regulate marine activities where they are part of an Inshore Fisheries and Conservation Authority (IFCA, see below).

Direct control

- **Managing activities that affect marine water quality:** Local authorities can control sources of pollution that originate on land but end up in the sea (for example, through surface water runoff management, drainage systems, and

[200] The United Kingdoms Blue Carbon Inventory
[201] CCRA3-Briefing-Marine
[202] Climate Change and Fisheries
[203] 9. Progress on SCCAP2 'Coastal and Marine Environment' outcome - Climate change adaptation programme: progress report 2023
[204] Welsh National Marine Plan
[205] OSPAR Report on potential solutions to overcoming barriers to effective management of Marine Protected Areas
[206] About the Marine Management Organisation – Marine developments

local waste management). Keeping pollutants out of coastal waters helps offshore ecosystems better cope with climate-driven stress.

- **Environmental health functions in coastal communities:** Where relevant, local authorities with Port Health responsibilities may monitor water quality for shellfish harvesting, respond to health risks from harmful algal blooms, or issue public warnings. These actions help manage the impact of offshore environmental change on public health and local industries.

Place shaping

- **Aligning Local Plans with Marine Plans at the land–sea boundary:** Marine plans operate alongside land use plans and both must be aligned where they meet at the mean high water / mean low water mark. Local planning decisions that affect the marine area should use and take account of marine plan policies to ensure activities on land do not conflict with offshore priorities.
- **Ensuring developments that affect the marine area consider marine impacts:** Local plans influence activities such as ports, coastal infrastructure, estuary developments and anything that may affect tidal waters. Local authorities should ensure that planning policies reflect the implications of these developments for the marine environment, including offshore habitats, navigation, and cumulative impacts.
- **Recognising that marine plans guide activities in and affecting marine waters:** Marine plans apply to any activity in, or impacting on, a marine area[207]. This means local authorities must consider how land-based decisions shape offshore systems (for example through runoff, pollution pathways, lighting, noise, or infrastructure that extends into tidal areas).

Showcasing

- **Piloting offshore habitat restoration techniques:** Councils can highlight community-led offshore projects such as restoring seagrass meadows or rebuilding oyster reefs, which improve marine biodiversity and strengthen ecosystem resilience in warming seas.
- **Testing climate-resilient aquaculture species:** Councils can showcase trials of new aquaculture species that are better suited to rising sea temperatures and changing ocean conditions, helping local industries prepare for future shifts in stock viability.

Partnerships

- **Collaboration with national agencies:** Close working relationships with national agencies are fundamental. This includes the Marine Management Organisation (MMO) for marine planning, licensing, and fisheries management in

[207] Local council guide; marine planning

England; Natural England for nature conservation advice and MPA management in England; and their counterparts in the devolved administrations: NatureScot, SEPA, and Marine Scotland in Scotland; NRW in Wales; and the DAERA Marine and Fisheries Division in Northern Ireland. Collaboration can involve joint project delivery, data sharing, strategic planning, and policy alignment.

- **Protecting marine environments through Inshore Fisheries and Conservation Authorities (IFCAs):** IFCAs are statutory bodies in England for protecting and managing the inshore marine environment (from the coast out to 6 nautical miles). IFCAs are committees or joint committees with representatives from local authorities, the Environment Agency, Natural England and the MMO, along with MMO appointees with relevant experiences such as fishers, academics, NGOs[208]. IFCAS have powers to make byelaws, communicate and enforce these, including by using vessels to make inspections. These authorities can pass bylaws that protect important sites for nature, such as restricting bottom trawling or dredging fishing gear which can destroy fragile ecologies such as seagrass.
- **Working with neighbouring local authorities:** Many marine processes, such as sediment transport, and climate risks, like regional sea-level rise or storm surges, transcend local authority administrative boundaries. Effective management requires collaboration with neighbouring local authorities, often through established marine groups or formal partnerships, to ensure joined-up approaches to Shoreline Management Plans implementation and marine monitoring programmes.
- **Partnering with academic institutions:** Universities and research institutions are vital sources of the latest marine related climate science, innovative adaptation solutions, and monitoring and evaluation expertise. Local authorities can partner with them to access this knowledge, co-develop locally appropriate adaptation strategies, and undertake research to assess the effectiveness of interventions. Universities are often members of IFCAs.
- **Engaging with local businesses and sectors:** Collaboration with local businesses, particularly those reliant on the marine environment such as fisheries organisations, aquaculture operators, tourism providers, and port authorities, is important for developing sector-specific adaptation plans and promoting sustainable practices that enhance resilience.

Involving, engaging & communicating

- **Raising awareness of risks and options:** Local authorities can help communities understand how climate change is affecting the sea by explaining issues such as warming waters, ocean acidification, changes in fish populations,

[208] Inshore Fisheries and Conservation Authorities: Conduct and Operation 2014-2018

and the arrival of new pests or pathogens. They can share clear, accessible information on what these changes mean for local industries such as fishing, aquaculture, and tourism, and outline the practical steps people and businesses can take to reduce additional pressure on offshore ecosystems.

- **Involving communities in planning and implementation:** Meaningful involvement of local communities in the development and implementation of coastal adaptation plans and projects is critical. This includes participation in SMP reviews, the designation of CCMAs, and the design of local coastal defence or habitat restoration schemes. Co-design approaches can lead to more robust and locally appropriate solutions.
- **Facilitating dialogue among stakeholders:** The marine environment is often an area of competing interests (e.g., development, conservation, recreation, industry). Local authorities can act as impartial facilitators, bringing together different stakeholder groups to discuss climate risks and adaptation options, mediate potential conflicts, and work towards shared solutions.
- **Communicating the benefits of adaptation:** It is important to clearly communicate the multiple benefits of adaptation actions which can include improved marine protection, enhanced biodiversity, carbon sequestration, and recreational opportunities. Highlighting these co-benefits can build public support and encourage investment and participation.
- **Supporting citizen science:** Local authorities can support or initiate citizen science programmes that involve local volunteers in monitoring marine biodiversity, water quality, or the success of habitat restoration projects. This not only provides valuable data but also deepens community engagement and understanding of marine environmental issues.

Nation-specific considerations

- **England:** Natural England provides nature conservation advice and is involved with Marine Protected Areas (MPAs). The MMO is responsible for marine planning and licensing in English waters[209]. England has 10 Inshore Fisheries and Conservation Authorities[210].
- **Scotland:** Scotland has its own National Marine Plan[211], with a new plan in development intended to explicitly address the global climate and nature crises[212]. Marine Scotland manages marine planning, licensing, and fisheries. The Dynamic Coast project provides national datasets, mapping, and analysis of coastal change to inform planning.

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[209] About the Marine Management Organisation – Marine developments
[210] Inshore Fisheries and Conservation Authorities: Conduct and Operation 2014-2018
[211] Scotland's National Marine Plan
[212] 9. Progress on SCCAP2 'Coastal and Marine Environment' outcome - Climate change adaptation programme: progress report 2023

- **Wales:** Wales has its own National Marine Plan[213]
- **Northern Ireland:** Northern Ireland has a Marine Plan[214] and DAERA is the lead government department, with its Marine and Fisheries Division responsible for marine matters.

[213] Welsh National Marine Plan
[214] Marine Plan for Northern Ireland | DAERA

4.4 Food security

What is food security? Food security measures people's access to safe and nutritious food, which is contingent upon both availability and affordability. The UK Government's 2021 UK Food Security Report identifies five core themes for understanding food security: global food availability, UK food supply sources, supply chain resilience, food security at the household level, and food safety and consumer confidence.[215]

What are the key climate risks? Climate risks to food security are due to global supply chains, international transport disruptions due to climate impacts, and the resilience of countries the UK depends on for food imports. Risks to domestic agriculture are addressed separately under the land system. [216]

What does a resilient food security system look like? An effectively adapted food security system would reduce reliance on single sources of food through diversifying sourcing regions and supply chains, driven by improved supply chain data. It would also address the limitations of 'Just-in-Time' food supply models and consider increases in food storage capacity. Reduced food waste can further strengthen the resilience of the whole food system.

4.4.1 What is the role of local authorities in adapting the food security system?

Direct control

- **Reducing and managing food waste to improve resilience:** Local authorities have direct control over household and some commercial food-waste collection and treatment. This function can include communication and intervention to reduce food waste, which increases the resilience of the food system[217].
- **Emergency response and last-mile food distribution:** Local authorities have a role in emergency response when food distribution is disrupted at a local level, for example due to extreme weather, power outages, fuel shortages, or transport disruption. Where last-mile delivery is affected, local authorities may need to act to help maintain access to food, especially for vulnerable residents. This can include coordinating with retailers, wholesalers, voluntary and community organisations, and emergency planners to support temporary distribution arrangements, prioritise critical settings such as care homes and schools, and provide targeted support where normal food access is interrupted.
- **Ensuring resilient food storage in council-run facilities:** As temperatures rise and supply chains face greater disruption, local authorities need to ensure that

[215] United Kingdom Food Security Report 2021
[216] Food systems, food security and supply chains
[217] Simpler recycling: household recycling in England - GOV.UK

food storage in council-run buildings (such as schools, care homes, community centres and market facilities) is resilient to both heatwaves and delayed deliveries. This includes checking that refrigeration and cold chain equipment can maintain safe temperatures during extreme heat, ensuring sufficient cold and dry storage capacity, and upgrading facilities where needed.

Procurement and commissioning & commercialisation

- **Commissioning services:** When commissioning food services Local authorities can work with suppliers to identify supply chain risks and can stipulate supply from diverse food sources to increase resilience.

Place shaping

- **Mapping local food systems and assets:** In certain context, local authorities may be in a position to map local food systems to understand where food comes from, how it is stored and distributed, and where weak points exist. This includes identifying reliance on external supply chains and risks from disruption, such as extreme weather or fuel shortages. Councils can also audit community food assets, including community kitchens, food hubs, allotments, warehouses, and voluntary and community sector capacity. This helps identify gaps, support local resilience, and plan how food support could scale up during disruptions or emergencies[218]. Local authorities need to consider the feasibility and appropriateness of such a mapping exercise and this maybe more relevant for areas with isolated communities.

Showcasing

- **Highlighting successful local food initiatives:** Local authorities can promote and celebrate successful examples of local food businesses or community projects that are contributing to food supply resilience and sustainable food systems.

Partnerships

- **Leading and facilitating multi-stakeholder partnerships:** Local authorities can act as convenors, strategic leaders, or key anchor partners in local food partnerships and broader multi-stakeholder initiatives aimed at building a resilient and sustainable food system.

Involving, engaging & communicating

- **Awareness raising and strategic communication:** Local authorities can communicate the risks posed by climate change to local food security. They can develop and disseminate accessible, engaging, and evidence-based information materials explaining local climate risks (such as heatwave effects on food

[218] National Preparedness Commission NPC-Just-in-Case

spoilage) and practical steps towards food resilience. The Food Standards Agency's approach to consumer guidance on food safety during extreme weather offers a relevant principle[219]. Southwark Council's "Make a Good Food Southwark pledge" is an example of such a campaign[220]. They can also communicate UK government advice on emergency preparedness, which includes emergency storage of non-perishable food[221].

- **Guidance for food businesses during extreme heat:** Local authorities can provide clear guidance to local food businesses on safe food storage and handling during periods of extreme heat, as part of their food safety responsibilities. This includes advice on temperature control, refrigeration capacity, stock rotation, and contingency planning during heatwaves or power outages, to reduce the risk of food spoilage and foodborne illness.

Nation-specific considerations

- **England:** Key national drivers include the Government Food Strategy[222]
- **Scotland:** Scotland has the Good Food Nation (Scotland) Act[223], and the "Local Food for Everyone" plan[224].
- **Wales:** The Welsh Government has published a Community Food Strategy[225] and PSBs are tasked with embedding food as a priority in their strategic planning and delivery.
- **Northern Ireland:** A Northern Ireland Food Strategy Framework[226] has been published, aiming to build environmentally sustainable and resilient food systems.

[219] FSA's response to climate adaptation | Food Standards Agency
[220] Good Food Southwark | Southwark Council
[221] Get prepared for emergencies - Prepare
[222] Government food strategy
[223] Good Food Nation (Scotland) Act 2022
[224] Section 4 - The Benefits of Local Food - Local Food for Everyone: Our Journey
[225] Community Food Strategy: integrated impact assessment
[226] NI Food Strategy Framework - Food at the Heart of our Society - A Prospectus for Change

4.5 Water and wastewater management

What is the water and wastewater management system? The water and wastewater management system covers the infrastructure and processes used to source, treat, and deliver potable water (water that is safe to drink), and to collect, treat, and safely dispose of wastewater, including drainage and sewer networks.

The operational and regulatory landscape of the UK's water and wastewater management system varies across nations (e.g., services are predominantly delivered privately in England and Wales and publicly in Scotland and Northern Ireland).[227,228,229,230]

What are the key climate risks? Climate change will increase the frequency and intensity of droughts during summer, which can lead to periods of water scarcity and pose risks to the reliability of water supply. Increased frequency and intensity of heavy rainfall and increased flooding can cause direct physical damage to critical water supply assets like treatment works, pumping stations, and pipe networks. It can also overwhelm wastewater systems, which can lead to the release of untreated or partially treated sewage into watercourses and urban areas. The water and wastewater system can also experience cascading risks from power outages, which can for example impact services in wastewater management plants. These vulnerabilities are particularly pronounced for smaller, often less robust private water supply systems, which serve some homes in especially more rural parts of the UK.[231, 232,233]

What does a resilient water and wastewater system look like? A resilient water supply must guarantee that adequate water resources are consistently available. This is achieved through a strategic combination of robust demand management measures (including reducing water consumption during water shortages and controlling leakage from the distribution network) and sustainable enhancements to supply, such as diversifying water sources (e.g., planned water transfers from less affected regions, rainwater harvesting), developing new storage capacity (e.g., new reservoirs), and implementing water recycling schemes. Water and wastewater infrastructure must be

[227] Water and Sewerage Companies (WaSCs) provide both drinking water and wastewater services. Water-only Companies (WoCs) supply drinking water but do not manage wastewater services.
[228] Water industry governance - Water
[229] Duties of the Drinking Water Inspectorate (DWI) | Department of Agriculture, Environment and Rural Affairs
[230] CCRA3 Chapter 4
[231] Water supply resilience and climate change
[232] Ofwats 4th Climate Adaptation Report
[233] Private Water Supplies and Climate Change

resilient to extreme weather events and where infrastructure is impacted, contingency and response plans need to be in place. [234,235]

4.5.1 What is the role of local authorities in adapting the water and wastewater system?

Local authorities have a multifaceted role in adapting water supply and wastewater management to the challenges of climate change. Despite the primary operational responsibilities resting with water companies (especially in England and Wales) and national regulatory bodies, local authorities exert significant influence through their direct actions, statutory powers, partnership capabilities, and leadership within their communities.

Direct control

- **Water efficiency in local authority buildings and operations:** Local authorities can implement targeted retrofitting programmes, installing water-efficient fixtures such as low-flow/ more efficient shower heads, low-flow toilets, aerated taps, and efficient irrigation systems for council housing, public parks, playing fields, and municipal gardens. The installation of smart water meters on local authority properties is a key enabling measure, allowing for real-time monitoring of water consumption, rapid detection of leaks (which can be a significant source of waste), and the identification of further opportunities for water savings. This data can inform maintenance schedules and investment priorities.
- **Land management for water retention and quality:** Local authorities often own and manage significant tracts of land, including public parks, open spaces, and sometimes agricultural tenancies. This land can be managed proactively to enhance water infiltration into the ground, reduce surface water run-off rates and volumes, and improve the quality of water entering local watercourses. Measures can include strategic tree planting (afforestation and riparian planting), the creation or restoration of wetlands and ponds, and, where appropriate, the restoration of small floodplains to provide natural water storage. The "Make Rain Happy" scheme in Essex[236], which used rain gardens and swales in a residential street, is a practical example of such an approach.

Procurement and commissioning & commercialisation

- **Sustainable procurement policies:** Local authorities can embed water efficiency and climate resilience criteria within their overarching procurement policies and detailed tender specifications for all relevant contracts. In the context of construction projects, they can mandate that developments achieve specific water efficiency credits under schemes like BREEAM (Building Research

[234] Resilience in the Round
[235] Resilient supply chains
[236] Essex's Make Rain Happy scheme to reduce flooding | Local Government Association

Establishment Environmental Assessment Method) or equivalent sustainability standards[237].

- **Commissioning of resilient infrastructure and services:** When local authorities commission the design and construction of new public facilities, such as schools, libraries, community centres, or social housing, they should specify high standards of water efficiency from the outset. This includes targets for per capita consumption, the incorporation of rainwater harvesting and greywater recycling systems where feasible, and the full integration of SuDS into the site design.

Place shaping

- **Spatial planning and local plans:** Comprehensive integration of water resilience and adaptation to water scarcity is essential within Local Plans, strategic development plans, and associated Supplementary Planning Documents (SPDs). This includes mapping areas critical for water resources, such as aquifer recharge zones[238].
- **Local Plans and water infrastructure:** Local Plans should also take account of major water-supply and wastewater infrastructure, including reservoirs, water-treatment works and wastewater-treatment plants. These facilities are essential for maintaining secure water supply and protecting public health, and many need upgrading to cope with future climate conditions. Planning policies can support this by safeguarding land needed for existing or expanded sites, identifying suitable locations for new strategic infrastructure, and ensuring that nearby development does not constrain future capacity improvements.
- **Requiring Sustainable Drainage Systems:** A key policy lever is requiring Sustainable Drainage Systems (SuDS) in all new developments. This must align with national policies and technical standards[239]. In Wales, Schedule 3 of the Flood and Water Management Act 2010 makes SuDS mandatory[240]. England has not yet implemented Schedule 3. Instead, England currently relies on the National Planning Policy Framework to encourage developers to use SuDS[241].
- **Development Management:** Through the development management process, local authorities can use planning conditions and Section 106 agreements (or equivalent mechanisms in devolved nations) to secure specific water efficiency measures, the implementation and long-term maintenance of SuDS, and financial or in-kind contributions from developers towards local flood resilience schemes or green infrastructure enhancements.

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[237] BREEAM Effectiveness
[238] Flood risk and coastal change - GOV.UK
[239] National standards for sustainable drainage systems (SuDS) - GOV.UK
[240] Sustainable Drainage Systems (SuDS) - House of Commons Library
[241] The review for implementation of Schedule 3 to The Flood and Water Management Act 2010

Showcasing

- **Pilot projects:** local authorities can initiate and support pilot projects to test and evaluate innovative water adaptation solutions within their local context. Examples include community-led rainwater harvesting schemes, the trial of novel SuDS designs or materials on public land, the implementation of smart water metering programmes in social housing to drive behaviour change, or the development of local water recycling initiatives for non-potable uses.

Partnerships

- **Working with water companies:** Local authorities must engage proactively and strategically with the water companies operating in their areas. This includes active participation in the consultation processes for Water Resources Management Plans (WRMPs) and Drainage and Wastewater Management Plans (DWMPs), ensuring that local needs, local authority strategic priorities (e.g., growth zones, communities at higher risk), and climate resilience objectives are adequately reflected in these statutory plans.
- **Development and delivery of joint projects**. There are opportunities for partnership initiatives focused on leakage reduction programmes, water efficiency promotion campaigns targeting households and businesses, the strategic implementation of SuDS (particularly retrofitting in urban areas) and catchment management schemes to improve raw water quality or regulate flow.
- **Cross-sectoral partnerships:** Close working relationships with national environmental regulators (the EA in England, SEPA, NRW, and the Northern Ireland Environment Agency (NIEA)) are key for coordinating efforts for water quality improvements, and the implementation of catchment-based approaches, often with environmental NGOs, through Catchment Partnerships (managing water across the whole river catchment, from the source to sea). Collaboration with Local Resilience Forums (LRFs) is also crucial for effective emergency planning, response, and recovery related to water incidents such as disruptions to water supply during droughts.
- **Regional and cross-boundary collaboration:** Many water-related climate challenges, such as water resource management, transcend local authority administrative boundaries. Participation in regional climate adaptation partnerships (e.g., Climate Ready Clyde[242] in Scotland) and establishing cross-authority working groups are effective ways to share knowledge, pool resources, develop common strategies, and coordinate actions at a more appropriate geographical scale.

[242] Climate Ready Clyde | Building a more resilient, prosperous and fairer Glasgow City Region

Involving, engaging & communicating

- **Promoting water efficiency:** Local authorities can act as a source of practical advice and resources for households and businesses on how to reduce water consumption. This includes disseminating water-saving tips (e.g., shorter showers, fixing leaks), providing information on choosing water-efficient appliances and fittings, and offering guidance on water-wise gardening practices.
- **Supporting vulnerable residents:** Local authorities have a particular responsibility to identify and support vulnerable residents who are disproportionately affected by water supply disruptions. This may for example include individuals with chronic health conditions. Local authorities should work with utility companies to ensure eligible residents are registered on Priority Services Registers (PSRs), which offer additional support during outages[243].

Nation-specific considerations

While many fundamental principles of water adaptation are applicable across the UK, the distinct policy, regulatory, and institutional frameworks governing water management and local authority functions in England, Scotland, Wales, and Northern Ireland necessitate tailored approaches.

- **England:** Water and wastewater services are primarily delivered by privatised Water and Sewerage Companies and Water-Only Companies. The Environment Agency serves as the principal environmental regulator, with Ofwat acting as the economic regulator. The Drinking Water Inspectorate oversees drinking water quality. Lead Local Flood Authorities, typically County Councils and Unitary Authorities, are responsible for managing local flood risks (from surface water, groundwater, and ordinary watercourses) as stipulated by the Flood and Water Management Act 2010. Water companies are required to produce Water Resources Management Plans (WRMPs) and Drainage and Wastewater Management Plans, with statutory consultation involving local authorities[244].
- **Scotland:** Scottish Water, a public corporation, is the sole provider of water and wastewater services. The SEPA is the environmental regulator, the Water Industry Commission for Scotland is the economic regulator, and the Drinking Water Quality Regulator for Scotland ensures drinking water standards. LAs are responsible for flood risk management under the Flood Risk Management (Scotland) Act 2009, working in partnership with SEPA to develop and implement flood risk management plans. A distinct responsibility of Scottish local authorities is the regulation of private water supplies[245].

[243] About the Priority Services Register | UK Power Networks
[244] Guiding principles for drainage and wastewater management plans
[245] Water industry governance - Water - gov.scot

- **Wales:** Water services are provided by Dŵr Cymru Welsh Water (a private, not-for-profit company) and Hafren Dyfrdwy (part of the Severn Trent group). Dee Valley Water also operates as a water-only company. Natural Resources Wales is the integrated environmental regulator, Ofwat is the economic regulator for Welsh companies, and the DWI oversees drinking water quality. LLFAs (Unitary Authorities) are responsible for leading on local flood risk management. A key distinction is the full commencement of Schedule 3 of the Flood and Water Management Act 2010 in Wales, which makes SuDS mandatory for new developments exceeding a certain size, with local authorities acting as SuDS Approving Bodies responsible for approving, and in most cases adopting and maintaining, these systems[246].
- **Northern Ireland:** NI Water, a government-owned company, is the sole provider of water and wastewater services[247]. The Utility Regulator oversees economic aspects, while the NIEA is responsible for environmental regulation and, through its Drinking Water Inspectorate unit, for drinking water quality[229]. The Department for Infrastructure Rivers is the lead body for flood risk management from designated main rivers and coastal defences. Councils have responsibilities in local flood risk assessment, emergency response, and influencing development through their Local Development Plans.

[246] Statutory National Standards For Sustainable Drainage Systems
[247] About - Northern Ireland Water

4.6 Energy

What is the energy system? The energy system includes infrastructure for production (for fuel supply) and generation (for electricity), national transmission networks for electricity and gas, local distribution networks that deliver energy to homes and businesses, and a growing number of electricity interconnectors that link the UK with European energy markets. The UK energy system is largely run by private companies, but it is tightly regulated by national bodies. Energy system governance differs between Great Britain and Northern Ireland, with Northern Ireland operating a separate, independently regulated energy system.

What are the key climate risks? Fuel and electricity systems face a range of climate-related risks to the reliability of energy supply. Flooding from rivers, surface water and coastal surges can damage above-ground fuel infrastructure, restrict access for emergency repairs, and disrupt supply chains. Extreme heat can impair the efficiency of cooling systems and therefore reduce throughput of refinery operations or require temporary shutdowns. Storms and high winds also pose hazards, damaging exposed fuel assets, storage facilities and pipelines. Electricity generation sites face similar risks from flooding, storms and reduced availability of cooling water. On the transmission and distribution side, overhead lines can be brought down by high winds or debris, or lose capacity during heatwaves due to thermal expansion, and substations and underground cables may be inundated during heavy rainfall. [17,248,249,250]

What does a resilient energy system look like? A resilient energy system requires infrastructure that is designed, located and maintained to withstand future climate impacts, supported by strong operational preparedness to keep energy flowing and recover quickly during disruptions. This includes robust emergency response plans, backup power for critical assets, and effective communication with the public. System resilience is further strengthened through flexibility and redundancy, including diverse energy sources, storage capacity and smart grid technologies.[251]

4.6.1 What is the role of local authorities in adapting the energy system?

While private energy providers own and operate much of the energy infrastructure and are subject to national regulation, LAs play an essential complementary role in shaping the local environment, protecting communities, and fostering partnerships.

[248] Climate adaptation report 2024
[249] Wales & West Utilities ARP4 Report
[250] Resilient supply chains
[251] Climate Adaptation Research and Innovation Framework

Direct control

- **Management of local authority assets and operations:** Local authorities must ensure their own critical buildings are resilient to power outages and disruptions in fuel supply. This involves assessing vulnerabilities and implementing measures like backup power generation for facilities crucial for emergency response or community support. Heating and cooling systems within council buildings should be adapted to reduce reliance on potentially vulnerable energy sources and to manage extreme temperatures more effectively; this could include incorporating passive cooling design in new builds or refurbishments, and transitioning to efficient electric heating systems.
- **Business continuity planning:** Robust business continuity plans are essential for all local authority services. These plans must explicitly account for potential energy disruptions due to climate impacts, outlining procedures to maintain critical functions, manage staff safety, and communicate with the public.
- **Energy efficiency:** Implementing comprehensive energy efficiency measures across the local authority estate reduces overall energy demand. This inherently lessens the organisation's exposure to supply disruptions and price volatility, while also contributing to mitigation efforts.
- **Emergency response role:** Local authorities have a direct role as emergency responders during power outages and fuel disruptions. They run community hubs, rest centres, and welfare checks that provide practical support to residents, especially during extreme weather. This includes keeping key buildings ready to open as safe, warm or cool spaces, ensuring they have backup power where needed, and coordinating local emergency support with partners.

Place shaping

- **Steering development:** Where feasible, new development, including critical energy infrastructure such as primary substations or significant fuel storage facilities, should be discouraged in areas identified as having high current or future climate risk (e.g., flood zones, areas prone to coastal erosion or significant land instability). Where this is not feasible, new developments should include measures that make them resilient to these climate impacts over their lifetime.
- **Land allocation for resilient energy:** Local Plans should proactively allocate suitable land for necessary resilient energy infrastructure.
- **Working with energy providers:** Local authorities can use their planning role, particularly in relation to granting permissions for some new developments (such as substations) to encourage or, where policies allow, require energy network operators to invest in specific resilience measures. This could involve requiring new substations serving development areas to be built above projected flood levels and with future climate projections in mind.

- **Highlighting climate resilience in strategic energy planning:** Local authorities feed into regional and national strategic energy planning, such as Regional Energy Strategic Plans and consultations for national energy plans including National Energy System Operator (NESO)'s Strategic Energy Spatial Plan and its Centralised Strategic Network Plan. They can use these consultations to highlight local climate risks and measures required to ensure local resilience is considered in strategic planning.

Showcasing

- **Pilot projects:** Other organisations often lead these projects. However, local authorities with capacity may choose to start or support new energy solutions, such as installing a smart microgrid with battery storage to keep the power on, or testing vehicle-to-grid technology using council vehicles to support the local power grid.

Partnerships

- **Partnering with Energy Network Operators:** Establishing strong, collaborative partnerships with energy network operators (including Distribution Network Operators (DNOs) for electricity, Gas Distribution Networks (GDNs), and national transmission operators like National Grid Electricity Transmission (NGET) (for electricity) and National Gas (for gas)) is paramount. These partnerships should facilitate the co-development of local energy resilience plans that align network operator strategies with local authority adaptation priorities.
- **Partnering with neighbouring local authorities:** Climate impacts and energy networks do not respect administrative boundaries. Collaboration with neighbouring local authorities is vital for addressing cross-boundary energy resilience issues, such as shared critical infrastructure, interdependent fuel or electricity supply chains, and regional-scale climate impacts like widespread flooding or storms.
- **Energy partnering with community groups:** Local authorities can support and partner with local community energy groups to develop decentralised, resilient renewable energy projects. These groups often have strong local relationships and can contribute to local energy security.

Involving, engaging & communicating

- **Providing information and advice:** Local authorities can offer practical guidance to households and businesses on how they can prepare for potential energy disruptions. This might include advice on improving energy efficiency (which reduces demand and exposure), exploring backup power options (where appropriate and safe), understanding what to do during a power cut or gas supply interruption, and accessing support services.

- **Supporting vulnerable residents:** Local authorities have a particular responsibility to identify and support vulnerable residents who are disproportionately affected by energy disruptions. This includes people who are reliant on electrically powered medical equipment, older people, those with chronic health conditions exacerbated by temperature extremes, and low-income households who may struggle with fuel poverty compounded by price volatility arising from supply disruptions. Local authorities should work with DNOs and utility companies to ensure eligible residents are registered on Priority Services Registers (PSRs), which offer additional support during outages[252].

Nation-specific considerations

The energy and fuel landscape in England, Scotland, and Wales (Great Britain) is fairly similar. Ofgem serves as the energy regulator for GB. Key players include:

- **Electricity transmission:** The high-voltage electricity transmission network across GB is operated by NESO, a publicly owned body. The transmission networks in England, Scotland and Wales are all owned and run by private companies. National Grid owns them in England and Wales, while in Scotland, they are owned by SSE Transmission and SP Energy Networks.
- **Gas transmission:** The national high-pressure gas transmission pipeline system in GB is owned and operated by the private company National Gas.
- **Distribution:** Local electricity and gas distribution networks are owned and operated by private companies. A number of regional Distribution Network Operators (DNOs)[253] manage the local electricity distribution networks, and regional Gas Distribution Networks (GDNs) manage the local gas pipelines.

In contrast, Northern Ireland has a distinct energy market structure:

- It has its own energy regulator, the Utility Regulator (UR).
- For electricity, the transmission system is operated by System Operator for Northern Ireland (SONI). SONI is a private company but is wholly owned by EirGrid, which is the Irish Transmission System Operator and a commercial state-owned company. The electricity transmission and distribution assets are owned by NIE Networks.
- For gas, Northern Ireland has its own separate gas transmission and distribution network operators. Key transmission pipelines are operated by companies such as GNI (UK) (for the main interconnector from Scotland), and distribution to consumers is handled by companies like Phoenix Natural Gas, SGN Natural Gas, and firmus energy.

[252] About the Priority Services Register | UK Power Networks
[253] Who is my DNO

While Northern Ireland's energy systems are interconnected with Great Britain (and the Republic of Ireland for electricity), its internal transmission and distribution networks are not operated as part of National Grid or National Gas. Despite these institutional differences, the underlying climate challenges to local energy systems are often similar across the UK.

4.7 Waste

What is the waste system? The waste system includes current waste management, collection, recycling and disposal as well as historic disposal sites such as landfill sites and disused mining tips (a legacy of UK mining). Local authorities bear the primary statutory responsibility for the management of household waste, and own many of these assets, although these services are often delivered by private companies. Conversely, businesses and commercial enterprises are accountable for managing their own waste and must adhere to environmental regulations. [254]

What are the key climate risks? Extreme weather poses significant risks to the waste system, especially to historic landfill sites and disused mining tips, which were built to older standards. Intense rainfall, flooding, groundwater rise, erosion and associated slope instability increase the likelihood of landfill slope failure, leachate release, gas migration and, for disused mining tips, landslips and debris flows that threaten nearby communities and infrastructure. Currently in-use waste facilities such as landfills, depots, or Energy from Waste plants also face growing risks from flooding, heat, storms and fire, while waste collection services are increasingly disrupted by extreme heat and flooding. [255,]

What does a resilient waste system look like? A resilient waste system achieves continuity of waste collection services despite extreme weather conditions through effective contingency planning, including flexible collection schedules, alternative vehicle routes, workforce planning for extreme heat or flooding, and mutual aid arrangements with neighbouring authorities or contractors. Waste infrastructure needs to be designed, sited or adapted to withstand extreme weather. A climate-resilient waste system would prioritise understanding where high-risk historic landfills and disused mining tips sites are located, how climate change alters their risk profile, and what preventative or preparatory actions could reduce the likelihood and consequences of failure. [256]

4.7.1 What is the role of local authorities in adapting the waste system?

Direct control

- **Resilience of local authority-owned/operated assets:** Local authorities must ensure that waste assets under their control remain operational during severe weather. This includes protecting depots, transfer stations and operational landfill sites from flooding, heat and storm damage through appropriate drainage, building design, and contingency planning. For closed landfill sites

[254] Dispose of business or commercial waste: Your responsibilities
[255] Changes to waste and recycling collections during the hot weather | NELC
[256] Increasing the climate resilience of waste infrastructure

under local authority responsibility, robust and regular maintenance of leachate and landfill gas management systems is paramount to prevent pollution incidents, especially under changing climatic conditions that might alter gas generation rates or leachate volumes.

- **Identification of climate risk at historic landfill sites and disused mining tips:** Local authorities together with the authorities like the Mining Remediation Authority should consistently identify historic landfill sites and disused mining tips within their areas and assess their exposure to climate risks. [257][258] This includes risks from intense rainfall, flooding, groundwater rise, slope instability and coastal erosion. At present, this is not done consistently across the UK.
- **Prioritisation of highest-risk legacy sites:** Once risks are assessed, local authorities should prioritise action at the highest-risk historic sites rather than treating all sites equally. Targeted monitoring, maintenance and preparedness at a small number of high-risk locations is likely to deliver the greatest adaptation benefit.
- **Management of coastal landfill risks:** A number of historic landfill sites are located along eroding coastlines. Sea-level rise, storm surge and coastal erosion increase the risk of buried waste becoming exposed and pollutants entering the marine environment. Local authorities should explicitly include coastal erosion when assessing landfill risk and planning adaptation responses.
- **Early intervention despite limited statutory duties:** Although local authorities are generally not required to take proactive action at closed landfill sites or disused mining tips, early intervention at the highest-risk locations would significantly reduce future environmental harm, public safety risks and emergency response costs.
- **Adapting operational procedures:** Developing and regularly updating comprehensive business continuity plans for all waste services is essential to ensure operational resilience during and after extreme weather events. These plans should explicitly address a range of climate impacts (e.g., prolonged heatwaves, widespread flooding, consecutive storms) and identify alternative collection routes, temporary waste storage locations, mutual aid agreements with neighbouring authorities, and strategies for rapid service recovery.

Procurement and commissioning & commercialisation

- **Embedding climate resilience in contracts:** Local authorities should incorporate specific climate adaptation and resilience requirements into tender documents and contractual obligations for all waste services, including collection, haulage, treatment and disposal. This could include clearly defined

[257] Management of legacy landfill
[258] Written Statement: Recommencement of the Disused Mine and Quarry Tips Task Force (17 March 2026) | GOV.WALES

performance standards expected under various extreme weather conditions (e.g., service continuity targets during floods or heatwaves) and mandatory requirements for contractors to develop, implement, and regularly review their own robust business continuity and climate adaptation plans.

- **Risk assessment and data services for legacy sites:** Local authorities can procure specialist services to systematically identify historic landfill sites and disused mining tips, assess their exposure to climate risks (including flooding, intense rainfall, slope instability and coastal erosion), and create a prioritised local risk register. This addresses the current lack of consistent data and provides a clear evidence base for action.
- **Emergency response and remediation frameworks:** Local authorities can establish pre-procured framework agreements with specialist environmental contractors for rapid response to landfill or disused mining tip failures. This ensures capacity is available quickly if flooding, erosion or slope failure causes hazardous waste to escape, reducing delays and costs during emergencies.

Place shaping

- **Strategic land-use planning:** Local Development Plans (LDPs), Local Plans, spatial development strategies, and supplementary planning documents must explicitly integrate climate change adaptation for waste infrastructure. Scotland's National Planning NPF4 Policy 12, for example, mandates that LDPs identify appropriate locations for waste infrastructure supporting the circular economy[49].
- **Using the planning system to reduce future exposure:** Local Authorities can use Local Plans and development management to avoid placing new housing, infrastructure or sensitive land uses near high-risk historic landfill sites or disused mining tips. This reduces future exposure and prevents the creation of new long-term liabilities.
- **Safeguarding high-risk sites through spatial policies:** Planning policies can identify historic landfill sites and disused mining tips as areas where development is restricted or carefully controlled. This helps prevent ground disturbance that could increase instability, mobilise contamination, or worsen climate-related risks. Local authorities can also require that as part of giving planning permission on or near historic landfill or disused mining tips sites, developers undertake remediation work to make these historic sites resilient to climate impacts.
- **Managing land use around coastal landfill sites:** Where historic landfill sites are at risk from coastal erosion, local authorities can use place shaping powers to manage land use around these locations. This includes avoiding new development that would complicate future adaptation responses or increase clean-up costs if waste becomes exposed.

Showcasing

- **Piloting innovative adaptation technologies and approaches:** Local authorities are in a good position to test new technologies and methods. These can improve the climate resilience of waste management. For example, councils can pilot new flood protection systems for important infrastructure. They can test water-efficient technologies in waste treatment. They can also evaluate how alternative fuel vehicles, such as electric bin lorries, perform during extreme heatwaves or floods.
- **Using pilot projects to test adaptation approaches:** Councils can pilot new approaches, such as improved monitoring, remote sensing, or nature-based erosion management at landfill sites, and use these examples to demonstrate what is feasible and effective under current powers.

Partnerships

- **Cross-local authority collaboration:** Local authorities should actively collaborate with neighbouring authorities on joint or aligned waste management strategies that explicitly incorporate climate resilience. This can include planning for shared resilient infrastructure (e.g., regional Material Recovery Facilities (MRFs) or disposal facilities designed to withstand future climate impacts), developing pre-agreed contingency and mutual aid arrangements that allow waste to be diverted to nearby facilities if local infrastructure is disrupted, and coordinating responses to cross-boundary climate risks.
- **Working with environmental regulators:** Local authorities can work closely with environmental regulators (for example the Environment Agency, Natural Resources Wales, SEPA and NIEA) to share data, agree risk assessments, and clarify responsibilities for monitoring and managing climate-related risks at historic landfill sites and disused mining tips.
- **Partnerships with national bodies responsible for legacy sites:** Where responsibility for disused mining tips or historic waste sites sits partly with national bodies or legacy landowners, local authorities can partner with these organisations to align risk assessments, prioritise the highest-risk sites, and coordinate funding and intervention plans.
- **Partnerships with the private sector:** Given the significant role of private contractors in delivering waste services, local authorities should foster collaborative relationships to develop and implement resilience measures. This includes open sharing of climate risk information, joint development of business continuity plans, and ensuring that contractual arrangements support adaptive capacity.

Involving, engaging & communicating

- **Continuity of waste services during extreme weather:** Local authorities can communicate clearly with residents and businesses about the role of waste services and how collections will operate during heatwaves, flooding or storms. This includes helping people prepare in advance by managing waste responsibly, explaining changes to collection schedules, safe storage of waste if collections are disrupted, and how to reduce health risks such as odour, pests or spoiled food.
- **Public awareness of risks from historic landfill sites and disused mining tips:** Where historic landfill sites or disused mining tips are present, local authorities can explain the risks and precautions to local communities, particularly from flooding, coastal erosion or slope instability. Clear communication helps build understanding of why monitoring, restrictions or remedial works may be needed.
- **Engagement on land use restrictions near high-risk sites:** Local authorities can engage residents, landowners and developers on why certain areas near historic landfill sites, disused mining tips or unstable ground may need restrictions on access, use or development as climate risks increase.
- **Protecting waste workers during climate impacts:** Local authorities can raise awareness among waste workers about climate-related risks such as heat, flooding and exposure to contaminated materials, and provide clear guidance on steps they can take to protect their health and safety during extreme weather.

Nation-specific considerations

- **England:** Key drivers include the Environment Act 2021 and the Resources and Waste Strategy for England. Defra is the lead government department. The "Simpler Recycling" reforms will significantly influence LA collection services and infrastructure needs[259]. Since April 2023 the Environment Agency has a new requirement for climate change risk assessments and adaptation plans for all sites operating under an environmental permit in England. Waste management is one of the largest sectors operating under these permits[260].
- **Scotland:** The NPF4 explicitly directs local authorities to plan for waste management infrastructure that supports the circular economy and considers climate resilience[49]. Zero Waste Scotland plays a key role in providing expert advice, support, and funding to local authorities to improve waste and resource management.
- **Wales:** Wales circular economy ambition is outlined in "Beyond Recycling: A strategy to make the circular economy in Wales a reality."[261] Natural Resources

[259] Simpler Recycling in England
[260] Climate change: risk assessment and adaptation planning in your management system - GOV.UK
[261] Beyond Recycling Strategy Document

Wales is the principal environmental regulator and provides advice and guidance on environmental management and climate adaptation.[262]

- **Northern Ireland:** Northern Ireland has an Environmental Improvement Plan[263], and its Waste Management Strategy is currently under consultation or review[264].

[262] WRAP - The Global Environmental Action NGO
[263] Environmental Improvement Plan for Northern Ireland
[264] NI Audit Office Report - Review of Waste Management in Northern Ireland

4.8 Digital and telecoms

What is the digital and telecoms system? The UK digital and telecommunications system encompasses a variety of technologies, including fixed-line networks for broadband and landline, mobile and satellite networks, and a rapidly expanding number of data centres. Ofcom is the independent regulator for the UK's communications sector, including telecoms, broadcasting, wireless spectrum, and the postal service (but currently not including data centres).

What are the key climate risks? Digital and telecoms infrastructure faces growing climate risks, with flooding posing the most immediate threat: floodwaters can damage underground cables, street cabinets (containing telecoms equipment), exchanges and data centres. Extreme heat also threatens network reliability by overheating equipment and straining cooling systems in exchanges and data centres. More broadly, cascading failures (where a failure in one system triggers failures across others) remain a critical concern because digital and telecoms systems depend heavily on, for example, power and water for cooling. Telecoms failures in turn hinder emergency response, transport operations and essential public and business services. [17,266,267]

What does a resilient telecoms system look like? A climate-resilient digital and telecoms system must keep businesses and people connected during extreme weather by protecting physical assets from flooding, heat and high winds. The architecture of the network itself must incorporate inherent resilience. This includes built-in redundancy, such as diverse physical routing for critical connections and backup systems for key components, alongside flexibility to re-route traffic and the ability to isolate faults effectively to prevent widespread service outages.[268]

4.8.1 What is the role of local authorities in adapting the telecoms system?

Although digital and telecommunications systems are predominantly privately-owned, there is still a role for local authorities to play in managing climate risks. These interventions range from managing their own assets and operations to influencing the wider infrastructure landscape through strategic partnerships and regulatory functions.

Direct control

- **Resilience of council IT systems and data centres:** Local authorities must conduct thorough climate risk assessments for all council-owned or operated data centres, server rooms, and critical IT infrastructure. These assessments should specifically consider local vulnerabilities to flooding (particularly for facilities in basements or flood-prone areas), overheating due to rising ambient

[266] Future-Proofing Digital Infrastructure: Climate Resilience in the Data Centre Sector
[267] Home - DARe
[268] Home - DARe

temperatures and heatwaves, and the reliability of power supplies during extreme weather events. It is important to note that techUK has highlighted that many public sector on-premises data centres often lack the resilience measures found in commercial facilities and can represent a "weak link" in the UK's digital infrastructure[266]. Comprehensive business continuity and disaster recovery (BCDR) plans specifically for IT systems must be developed, regularly tested, and updated to reflect evolving climate-related disruption scenarios.

- **Public Wi-Fi networks:** Where local authorities provide public Wi-Fi networks, they must ensure that access points, particularly those located in public buildings or exposed outdoor spaces, are resilient to prevailing weather conditions (e.g., appropriately waterproofed, tolerant of temperature extremes).
- **Emergency communication systems:** Local authorities must ensure that any emergency communication systems they directly manage or rely upon (e.g., for internal council coordination, communication with emergency responders, or community alert systems) have resilient backhaul connectivity and thoroughly tested power backup systems. Active participation in Local Resilience Forum initiatives aimed at ensuring resilient communications, such as the Mobile Telecommunication Privileged Access Scheme, is crucial for coordinated emergency response[269].

Procurement and commissioning & commercialisation

- **Embedding resilience in ICT tenders:** Local authorities should incorporate specific and measurable climate resilience criteria into their procurement specifications for all digital services, ICT hardware, software solutions, and telecommunications contracts. These criteria could include requirements for equipment to tolerate projected local temperature ranges, humidity levels, and potential water ingress, in line with future climate projections. Where appropriate, this should include procuring server and data hosting services from co-located or specialist datacentre providers with built-in redundancy, rather than relying on single on-site servers, particularly for essential services.
- **Commissioning resilient infrastructure:** When local authorities commission new services that depend on the deployment of new digital infrastructure (e.g., smart city projects, public safety networks, or community broadband initiatives), they must ensure that climate resilience is treated as a core design principle from the project's inception.

Place shaping

- **Local Plan policies:** Local authorities should integrate specific policies into their Local Plans that explicitly require new digital infrastructure (including telecommunications masts, street cabinets, data centres, and fibre optic routes)

[269] Guidance for Local Resilience Forums' Telecommunications Sub Groups

to be sited and designed in a manner that ensures resilience to identified local climate risks such as flooding, heat stress, storm damage, and subsidence. These policies must be forward-looking, taking into account long-term climate projections for the operational lifespan of the infrastructure. Local authorities can also develop Supplementary Planning Documents (SPDs) to provide more detailed, practical guidance on achieving climate-resilient design and appropriate location for digital infrastructure.

Showcasing

- **Demonstrating good practice in local authority operations:** Publishing case studies, guidance documents, or lessons-learned reports based on their experiences in implementing adaptation measures for council IT systems, data centres, or public-facing digital services can be highly valuable. For example, Norfolk County Council shared its experience with the Cyber Assessment Framework for local government, which includes important resilience aspects[270]. Local authorities can also actively participate in knowledge-sharing networks and forums.

Partnerships

Given that the vast majority of digital and telecommunications infrastructure is privately owned and operated, collaboration and partnership are important for effective climate adaptation. Local authorities should proactively act as conveners, facilitators, and active partners in these efforts.

- **With Local Resilience Forums (LRF) and equivalents:** Local authorities can advocate for LRFs to move beyond a purely responsive approaches towards proactive adaptation planning for critical digital infrastructure.
- **Leveraging national partnerships (e.g., LGA and techUK):** Local authorities can leverage national-level partnerships, such as the Memorandum of Understanding between the Local Government Association and techUK. This MoU aims to foster collaboration, share knowledge, and address shared priorities including cybersecurity and resilience, offering a platform for local authorities to engage with the technology industry on adaptation[271].

Involving, engaging & communicating

- **Raising awareness among residents and businesses:** Local authorities should inform residents and local businesses about the risk of losing essential digital services during extreme weather (for example internet outages, mobile phone disruption, or loss of digital payment methods). They should also explain the practical steps people can take to prepare. This is especially important for

[270] Norfolk County Council's experience with the Cyber Assessment Framework for local government – MHCLG Digital

[271] LGA and techUK sign new agreement to strengthen digital innovation in local government | LGA

people who may be vulnerable or depend on telecoms services for health or safety reasons. Local authorities can share information on back-up options, including the support that telecoms companies must already provide to vulnerable customers that rely solely on a landline or the 2 million[272] people who rely on telecare service, during power cuts.

- **Support Priority Services Registers**: Local authorities have an important role in helping residents join the Priority Services Register, so that energy and water companies know who needs extra help during outages or emergencies.
- **Developing Local Communication Plans for disruptions:** Local authorities, typically working through their Local Resilience Forums, must establish clear, pre-agreed communication protocols for informing the public during climate-related disruptions to digital services. These plans should detail how information will be disseminated if primary digital channels (like websites or social media) are themselves down, outlining alternative methods for accessing information and emergency support.

Nation-specific considerations

- **UK:** Ofcom provides UK-wide regulatory oversight for the telecommunications sector and issues guidance on network resilience[273].
- **Scotland:** Civtech is the Scottish Government challenge programme that focuses on harnessing technological innovation to solve public sector problems[274].

[272] Telecare National Action Plan: protecting telecare users through the digital phone switchover - GOV.UK
[273] Network security and resilience - Ofcom
[274] CivTech Scotland

4.9 Transport

The UK transport system encompasses road, rail, aviation, and maritime transport, with roads being the dominant mode of passenger and freight transport. Aviation and maritime transport are covered in the detailed chapters, but not in the executive summary.

What is the transport system? The road system is the interconnected network of roads, highways and associated infrastructure. The strategic road network (motorways and major A-roads) is managed directly by government or government owned companies (e.g. National Highways in England), while the much more extensive local road network is managed and maintained by local highways authorities. The rail system is the integrated network of railway tracks, stations, trains and control infrastructure. In GB, the rail network is publicly owned and managed by Network Rail. It is currently moving from Network Rail to a new national body called Great British Railways (GBR). In England, passenger services are operated by private companies or publicly operated, whilst in Scotland and Wales all services are publicly operated. In Northern Ireland the rail system is both owned and operated under a fully public model.

What are the key climate risks? Coastal rail routes and roads face growing risks from sea-level rise and storm surges. A growing share of the road and rail network is exposed to flooding which can result in road and rail closure or dangerous driving conditions, with over a third of road kilometres already at risk and projections suggesting this could rise to around half by 2050. Flooding and higher river flows also increase the likelihood of bridge scour, while drought-related ground cracking and heavy rainfall can trigger landslides on road and rail embankments and cuttings. Heatwaves can soften asphalt and cause rutting, as well as increase the risk of tyre blowouts, creating road-safety hazards and adding to maintenance costs. Extreme heat can buckle rails or cause overhead lines to sag, forcing speed restrictions and cancellations. In areas with shrink–swell clays, ground movement can distort track alignment and disrupt services. Severe storms can also damage overhead lines, fell trees, obstruct rail tracks and roads and impair signalling, often resulting in major delays and line closures. [275,276]

What does a resilient transport system look like? A climate-resilient road and rail system requires well-rehearsed contingency plans for major disruptions (including reliable rail-replacement options), and rapid and coordinated recovery especially for vulnerable users. It also requires careful management of interdependencies such as power and telecoms. Operational resilience depends on real-time weather monitoring, clear protocols for temporary speed limits or road closures, and effective communication with road and rail users. Long-term resilience also relies on durable

[275] CCRA3 Briefing Transport
[276] Progress in adapting to climate change: 2025 report to Parliament - Climate Change Committee

infrastructure: roads and tracks, bridges, signalling and stations, drainage and culverts (structures that allow water to pass beneath roads, railways or embankments) need to be designed or upgraded for heavier rainfall, high winds, higher temperatures and scour. In addition, it requires robust drainage, stable embankments and cuttings, and proactive vegetation management to reduce flood, slope-failure and visibility risks.

4.9.1 What is the role of local authorities in adapting the transport system?

Local authorities can play a key role in delivering climate-resilient local transport systems. They can achieve this through a variety of direct and indirect levers.

Direct control

- **Local roads, pavements and associated infrastructure:** Local highways authorities can implement enhanced and proactive maintenance regimes for drainage systems (gullies, culverts, ditches) to reduce surface water flood risk. This might involve increased inspection frequency and targeted clearance, especially prior to predicted heavy rainfall seasons. Wiltshire Council, for example, allocated an additional £1 million for preventative flood maintenance on its highways[277]. Highways authorities can make roads and pavements more resistant to the effects of extreme heat and water damage by using more heat and water-resilient asphalt mixes, improving surface treatments, and adjusting maintenance schedules to repair early signs of rutting or softening.[278]
- **Local authority-owned buildings and transport hubs:** Local authorities can retrofit their own transport-related buildings, such as depots, bus stations, and administrative offices, car parks and cycle parking, to enhance resilience against flooding (e.g., installing flood barriers, raising electrical systems) and overheating (e.g., implementing passive cooling measures, improving ventilation).
- **Local authority operations and vehicle fleets:** Local authorities can develop and implement robust severe weather protocols for all their own or contracted transport services, including school transport, social care transport, and waste collection fleets.
- **Public rights of way (PRoW):** Local authorities can maintain and adapt the PRoW network (footpaths, cycleways, bridleways) to ensure they remain accessible and safe under changing climate conditions. This can include surface improvements to prevent waterlogging or erosion, enhanced drainage, and rerouting paths away from high-risk areas.
- **Management of council-owned land next to transport routes:** Local authorities can manage the land they own or control around roads, cycling infrastructure, paths, and rail and tram lines in ways that reduce climate risks.

[277] Wiltshire Council Adaptation Delivery Plan
[278] ADEPT Guidance on resilience of surfacing materials final (SMDS March 2024).pdf

This can include improving drainage to limit surface water runoff onto roads or rail, maintaining vegetation to reduce soil erosion or fallen tree risks, and adapting green spaces so they slow and store water during heavy rainfall. These actions do not replace the responsibilities of road or rail operators, but they can complement their resilience work and reduce local impacts.

Procurement and commissioning & commercialisation

- **Transport service contracts:** Local authorities could include mandating that operators have robust business continuity plans for extreme weather events, specifying minimum vehicle standards that consider issues like passenger and staff comfort during heatwaves (e.g., effective ventilation or air conditioning), or requiring driver training on operating safely in adverse conditions.
- **Local authority services:** In instances where local authorities operate services on a commercial basis (e.g., some local authority-owned bus companies, or if they manage local airports or ports at a smaller scale), climate resilience must be embedded into their business plans, operational procedures, and investment strategies.

Place Shaping

- **Local Plans and spatial strategies:** Integrating clear climate adaptation objectives and specific policies for transport resilience into core planning documents such as Local Plans, Local Development Frameworks, and Local Transport Plans is fundamental. These policies should identify areas vulnerable to climate impacts (e.g., floodplains, coastal zones, unstable slopes) and guide transport-related development away from high-risk zones or ensure that any development in such areas incorporates exceptionally high resilience standards.
- Spatial strategies should allocate land for resilient transport infrastructure and proactively plan for green infrastructure solutions that can mitigate transport-related climate risks. This could include designating flood storage areas to protect key transport corridors or requiring green corridors along transport routes to reduce heat island effects and manage surface water.
- **Development management:** Through the development management process, local authorities must rigorously assess planning applications to ensure new developments incorporate climate-resilient transport access, including active travel routes. This includes requirements for flood-free access and egress routes, the use of permeable paving for car parks and minor roads, and the integration of Sustainable Drainage Systems to manage surface water runoff from new roads and hardstanding areas effectively.
- **Transport planning and network management:** Local highways authorities are responsible for designing and managing their local road and active travel networks to enhance overall resilience. This involves identifying critical routes

that need to be kept open during emergencies, planning and signing robust diversion routes, and implementing traffic management measures that can also incorporate green infrastructure elements (e.g., tree planting for shade, rain gardens in verges).

Showcasing

- **Pilot projects and innovation:** Local highways authorities can learn from innovation trials such as Live Labs 2[279] , a three-year DfT funded innovation project across local highways authorities with ADEPT to decarbonise and adapt highways. They can also trial new climate-resilient materials or construction techniques on sections of their local road network or other transport infrastructure to assess their effectiveness and cost-efficiency in local conditions.
- **Investing in and supporting research and development (R&D):** Local authorities can partner with academic institutions, research bodies, or innovation hubs (such as the Decarbonised, Adaptable, Resilient Transport Infrastructures (DARe)[280]) to explore and develop new adaptation solutions tailored to local transport challenges.

Partnerships

- **With transport operators:** Local authorities need to work closely with private and public transport operators (bus companies, rail operators, freight companies) to develop coordinated emergency response plans, establish clear communication channels for sharing information on network status during disruptions, and agree on roles and responsibilities.
- **With national agencies and government bodies:** Local highways authorities must maintain strong liaison with national agencies like National Highways (in England), Transport Scotland, the Welsh Government (Transport Division), and the Department for Infrastructure (in Northern Ireland) regarding the resilience of strategic transport networks and, critically, their interface points with local road networks.
- Working collaboratively with environmental agencies such as the EA, SEPA, NRW and NIEA is vital for managing flood risk that affects transport infrastructure. This includes sharing data, coordinating on flood defence schemes, and developing integrated water management strategies. Local authorities can also utilise existing forums like the Infrastructure Operators' Adaptation Forum (IOAF) to drive industry collaboration on adaptation[281].

[279] Live Labs 2 | ADEPT
[280] Home - DARe
[281] Adapting the UK's transport system to the impacts of climate change: summary of responses - GOV.UK

Involving, engaging & communicating

- **Awareness raising and education:** Local authorities can provide practical information and advice on how individuals and businesses can prepare for transport disruptions (e.g., planning alternative routes, having emergency travel kits, considering flexible working arrangements) can enhance personal and community resilience.

Nation-specific considerations

- **England:** Key documents include the DfT climate adaptation strategy for transport[282]. The DfT also provides specific guidance on climate risk assessment for the transport sector[283]. Local Transport Plans are key statutory documents prepared by local transport authorities.
- **Scotland:** Transport Scotland, the national transport agency, has published its "Approach to Climate Change Adaptation and Resilience"[284]. Seven statutory Regional Transport Partnerships also play a strategic role in transport planning and delivery across council areas[285].
- **Wales:** "Llwybr Newydd – The Wales Transport Strategy" sets the direction for transport. Four Corporate Joint Committees have been established with statutory responsibilities for preparing Regional Transport Plans[286], which will need to integrate climate adaptation.
- **Northern Ireland:** Northern Ireland has 11 unitary councils. However, direct responsibility for most transport infrastructure (including the road network) and strategic transport planning rests with the national Department for Infrastructure.

[282] Climate adaptation strategy for transport - GOV.UK
[283] Climate risk assessment guidance for the Transport Sector
[284] Our Approach to Adaptation and Resilience | Transport Scotland
[285] National transport strategy transport governance working group
[286] The Corporate Joint Committees (Transport Functions) (Wales) Regulations 2021

4.10 Built environment and communities

What is the built environment and communities system? This system brings together homes, commercial buildings, public buildings and shared spaces, and the wider urban environment that shapes people's daily lives. It also includes the social and organisational structures that support community resilience.

What are the key climate risks? Flooding is one of the most immediate climate risks facing the UK's towns, cities, buildings, and homes[17]. Many urban areas are already vulnerable to surface-water flooding during heavy rainfall, while some neighbourhoods sit in river or coastal locations where flood risks are increasing.

There is also a growing risk of extreme heat for the UK's towns, cities, buildings, and the people who live in them. Hot weather can cause buildings to become uncomfortably warm, and create higher temperatures in built-up areas (known as the Urban Heat Island effect, where cities stay hotter than nearby rural areas).

Coastal regions across the UK face the dual threats of accelerated coastal erosion and rising sea levels, which lead to permanent inundation of low-lying land and a significant increase in the frequency and severity of coastal flooding. Other climate impacts include subsidence and heave, high winds and storms, landslides, wildfires, impacts on structural integrity, risks to indoor environmental quality (e.g., increased risk of mould and damp). [287]

What does a resilient built environment and communities system look like? New and existing buildings are designed and retrofitted to withstand climate impacts[121], for example through the inclusion of passive and active cooling measures or property-level flood protection. Existing development located in areas of high or increasing vulnerability is progressively adapted to reduce risk, including through the inclusion of green and blue infrastructure (natural and semi-natural features such as rivers, wetlands, parks and trees) to reduce heat and flood risk. In circumstances where adaptation is not viable, pathways for managed relocation or realignment are considered and planned for in a socially equitable manner.

4.10.1 What is the role of local authorities in adapting the built environment and communities system?

Local authorities' role stems from a combination of statutory responsibilities, extensive place-shaping powers (particularly through the planning system), intimate local knowledge, and their established position as community leaders and convenors.

[287] Indoor Air Quality

Direct control

- **Local authority-owned buildings and estates:** Local authorities manage a diverse range of public buildings, including offices, schools, libraries, leisure centres, community facilities, and, in many cases, social housing stock. They can directly implement adaptation measures by retrofitting existing buildings to increase resilience to overheating (e.g., through passive cooling strategies like shutters and fans or active cooling), implement property-level flood protection measures where at risk, and ensure good indoor air quality.
- **Local authority-owned land and public spaces:** Local authorities also control large areas of land, such as parks, open spaces, highways land, and land around public buildings. How this land is managed can help cool towns and cities and reduce flood risk. For example, councils can plant and protect trees, increase green space, restore soils, and create features that absorb and slow surface water. These actions can reduce local temperatures during heatwaves and lower the risk of surface water flooding.
- **Management of local authority-owned coastal assets:** Many local authorities own and manage critical coastal assets such as ports, harbours, piers, promenades, sea walls, and other coastal defence structures, as well as public buildings and facilities located in coastal zones. A key action is to assess the vulnerability of these assets to current and future climate impacts, including sea-level rise, increased storm surge frequency and intensity, and coastal erosion.
- **Day-to-day land and asset management:** Routine council activities, such as park maintenance, grass cutting, tree management, and highway verge management, can be adjusted to support climate adaptation. This includes allowing grass to grow longer during hot periods to reduce heat stress, managing vegetation to improve shade and drainage, and maintaining trees so they continue to provide cooling and water-management benefits without creating safety risks.
- **Lead Local Flood Authority responsibilities:** In many areas, local authorities act as Lead Local Flood Authorities. In this role, they are responsible for managing the risk of flooding from surface water, groundwater, and ordinary watercourses. This gives councils direct control over local flood risk planning, including preparing local flood risk management strategies, investigating flood incidents, and working with partners to reduce risk. Councils can use this role to connect flood risk management with wider place-based action. For example, they can align flood strategies with decisions about how council-owned land is used, where green space is created, and how surface water is managed in streets, parks, and public estates. This helps reduce flood risk while also

delivering wider benefits such as cooling towns and cities and improving public spaces.

- **Environmental health functions:** Local authorities also have environmental health responsibilities that are directly relevant to adaptation. Environmental health teams can identify and respond to risks linked to overheating, damp and mould, poor ventilation, and indoor air quality, particularly in private rented housing. They can enforce housing standards, provide advice to residents and landlords, and take action where conditions pose a risk to health. These powers are especially important for protecting vulnerable residents during heatwaves or periods of prolonged damp weather.

Procurement and commissioning & commercialisation

- **Procurement policies and practices:** Local authorities can use their procurement policies to require climate resilience in the buildings they commission, refurbish, or operate. This includes asking for climate risk assessments for new council buildings and major refurbishments, and requiring designers and contractors to show how buildings will cope with future heat, heavy rainfall, and flooding. Councils can also specify practical measures such as shading, passive cooling, adequate ventilation, flood-resilient materials, raised services, and durable finishes that are suitable for hotter and wetter conditions.
- **Commercialisation and market development:** Through their role as major building owners and clients, local authorities can help build local markets for climate-resilient building solutions. This could include supporting local supply chains for overheating mitigation (such as external shading, green roofs, or reflective materials), sustainable drainage features used around buildings, and services that assess and improve indoor environmental quality (for example ventilation, moisture control, and overheating risk). By setting clear requirements in council projects, local authorities can give local firms the confidence to invest in these skills and products.

Place Shaping

- **Spatial planning and strategy:** Through the development of Local Plans, Supplementary Planning Documents (SPDs), and broader spatial strategies, local authorities can steer new development away from areas of high or increasing climate risk, such as functional floodplains, coastal erosion zones, or areas prone to landslides, wherever possible. They can also allocate land for strategic green and blue infrastructure networks, flood storage areas, and other dedicated adaptation measures. Local Plans, Neighbourhood Plans, and SPDs are also crucial tools for local authorities to promote climate-resilient design standards in more suitable locations. A key mechanism for this is the

designation of Coastal Change Management Areas (CCMAs)[288] in Local Plans. CCMAs are areas identified as likely to be affected by coastal change (physical changes to the shoreline such as erosion, coastal landslip, permanent inundation or coastal accretion), and policies within these areas can restrict new development, manage existing development, and facilitate relocation or roll-back of assets at risk.

- **Planning restrictions in high-risk coastal zones:** Utilising spatial planning powers to designate CCMAs[289] and restrict new development in areas at high risk of coastal erosion or flooding. For any development deemed essential in such areas, local authorities must enforce stringent resilient design and construction standards.
- **Development management:** Local authorities can apply local planning policies to require high standards of climate-resilient design and construction in all new developments and major refurbishments. This can include mandating SuDS for surface water management, passive (and sometimes active) cooling measures to prevent overheating in buildings, and flood-resilient construction techniques in areas at risk. Planning policies can also shape the wider design of developments. This includes the layout and treatment of communal spaces, streets, gardens, and courtyards to provide shade, reduce heat, and manage surface water. For example, councils can require trees and planting, permeable surfaces, green space around buildings, and water-sensitive landscaping that helps cool neighbourhoods and reduce local flood risk.

Showcasing

- **Pilot projects and innovation:** Local authorities can trial novel SuDS designs, implement community-based heat resilience initiatives (e.g., cool zones, volunteer networks), or test smart technologies for managing internal environmental quality in social housing.
- **Demonstration sites and exemplar developments:** Local authority-owned assets (e.g., new council offices, schools, retrofitted public buildings) or specific new developments where the local authority has significant influence can be designed and promoted as exemplars of climate-resilient practice. These sites can serve as tangible demonstrations of what can be achieved.
- **Supporting scale-up and replication:** Beyond individual projects, local authorities can facilitate the wider adoption and scaling-up of successful adaptation measures. This can be achieved by embedding proven solutions into local policies and standards, offering local incentives, or forging partnerships to replicate successful initiatives across their area or with neighbouring authorities.

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[288] Flood risk and coastal change - GOV.UK

[289] Coastal Change Management Areas Opportunities for sustainable solutions in areas subject to coastal change - NECR275

Fife College's work in championing adaptation measures within building standards in Scotland is an example of influencing wider practice[290].

Partnerships

- **Convening stakeholders and facilitating dialogue:** Local authorities can act as convenors, bringing together diverse stakeholders to co-design adaptation solutions, share local knowledge and data, and coordinate efforts on specific issues. This might involve organising workshops for local businesses on flood resilience planning, establishing forums for community input on green infrastructure development, or facilitating dialogue between developers and residents on climate-resilient design for new housing.
- **Joining and contributing to existing initiatives:** Local authorities can benefit from and contribute to existing national, regional, or sectoral adaptation networks and programmes. Examples include participating in Adaptation Scotland's Public Sector Climate Adaptation Network[291], Local Resilience Forums (LRFs) which coordinate emergency preparedness and response, or industry-specific forums like the Climate Ready Infrastructure Forum in Scotland[292].

Involving, engaging & communicating

- **Awareness campaigns and public information:** Local authorities can run targeted awareness campaigns to inform the public and local businesses about specific climate risks (e.g., how to prepare for a flood, recognising the signs of heat stress, the importance of water conservation during droughts) and the adaptation measures they can take. This includes advice on preparing buildings for flooding and heat, awareness about adequate insurance, recognising signs of heat stress, and using water efficiently during dry periods. These campaigns can also provide clear information on property-level flood resilience, such as installing flood doors or barriers, using water-resistant materials, raising electrical sockets, and protecting boilers and other services. Councils including Cornwall and Worcestershire have partnered successfully with expert Flood Mary[293] to promote flood awareness and preparedness.
- **Promoting wider neighbourhood resilience:** This includes guidance on using permeable surfaces in gardens and driveways, planting trees and vegetation, creating rain gardens, and avoiding hard paving where possible. These measures help absorb rainwater, reduce surface-water flooding, and support cooling in

[290] Supporting construction of a climate-resilient Dunfermline Learning Campus - Adaptation Scotland
[291] Public Sector Climate Adaptation Network - Adaptation Scotland
[292] Climate Ready Infrastructure Scotland Forum - Adaptation Scotland
[293] Home - Flood Mary

towns and cities. Campaigns should also signpost residents and businesses to available grants, support schemes, and advisory services where these exist.

Nation-specific considerations

- **England:** The National Planning Policy Framework (NPPF) sets out planning policies for England and includes requirements for local plans to take account of climate change and for new development to incorporate measures like SuDS. Building Regulations (e.g. Part O on overheating) also play a role in shaping building resilience. There is no standalone flood resilience requirement within the Building Regulations. Flood risk is primarily addressed through the planning system. The Environment Agency does however provide extensive guidance and data on flood risk and coastal change, and acts as a key delivery partner. LRFs are multi-agency partnerships that coordinate preparedness and response to emergencies, including climate-related events.
- **Scotland:** There is a strong emphasis on a place-based approach to adaptation and fostering collaborative action in the NPF4 has a strong focus on creating "Liveable places". Flood risk is explicitly addressed within the building standards framework. Standard 3.3 (Flooding and groundwater)[294] requires buildings to be designed to mitigate flood risk.
- **Wales:** Planning Policy Wales (PPW) and Technical Advice Note 15 (TAN 15) on Development, Flooding and Coastal Erosion are key planning documents guiding resilient development. Natural Resources Wales is the principal environmental regulator and advisor, playing a key role in flood risk management, environmental protection, and providing data and guidance. Public Services Boards bring together local public service leaders to improve well-being, including addressing climate risks. There is an emphasis on a systems-based approach to risk management and strong community engagement.
- **Northern Ireland:** NI's Building Regulations contain limited reference to flood resilience[295].

It is also worth noting that some building regulations and planning controls in England and Wales do not apply in the same way to changes of use carried out under permitted development rights, such as the conversion of offices or other commercial buildings into residential use.

[294] A good practice approach to property flood risk assessment and mitigation to inform review of the guidance published in support of Building Standard 3.3 'flooding and groundwater'
[295] Building Regulations (Northern Ireland) Order 1979


COUNTY • SESSIONS • HOUSE

4.11 Public services

What are public services? For the purpose of this report, the public services system includes education, justice (for this report only specific local justice functions are considered) and emergency services (for the purpose of this report, health and social care are covered in section *4.13 Health*). Under the Civil Contingencies Act 2004, LAs are designated Category 1 responders alongside police, fire, ambulance services and the UK Health Security Agency. Category 1 responders, such as local authorities, must assess local risks maintain emergency and business-continuity plans, and ensure the public is warned and informed during emergencies. Local authorities play a central role in this system by chairing multi-agency partnerships responsible for coordinating local emergency preparedness and response. [296,297,298]

What are the key climate risks? In education, extreme heat can make classrooms, playgrounds and sports fields unusable, while flooding and can damage or limit use of school buildings and outdoor learning spaces. Older school buildings are particularly vulnerable, and disruption to local transport networks can further affect pupil and staff attendance and continuity of learning.

In the local justice system, Youth Offending Team (YOT) offices are increasingly vulnerable to overheating and flooding, which can disrupt services, damage records and affect staff working conditions. Extreme weather can also hinder community-based supervision. More broadly, the justice system depends on safe and reliable access to court buildings; flooding, disrupted transport and unsafe travel conditions can delay or cancel hearings, slowing case progression and contributing to backlogs.

More frequent and severe climate-related extreme weather incidences are expected to increase demand on emergency services, stretching resources, slowing response times and contributing to staff fatigue. Extreme weather can also limit staff availability due to illness or transport disruption, while high temperatures pose welfare risks such as heat stress for responders working in personal protective equipment. [299,300]

What does a resilient public service sector look like? Many of the aspects that characterise a well-adapted public services system fall under the built environment and communities and transport system, as essential buildings need to be adapted and transport routes for staff and emergency services available. In addition, core services should be designed and operated to maintain critical functions during and after extreme weather events and prioritise the safety, health, and wellbeing of vulnerable people[301].

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[296] Must know: A guide to education | Local Government Association
[297] Crime and Disorder Act 1998
[298] The role of Local Resilience Forums - A reference document
[299] Sustainability and climate change: a strategy for the education and children's services systems
[300] UK not fully prepared for impacts of climate change, say Fire Chiefs - NFCC
[301] Child health inequalities and climate change in the UK - position statement | RCPCH

4.11.1 What is the role of local authorities in adapting the public services system?

Local authorities are pivotal in driving the adaptation of public services to climate change. Their multifaceted roles, spanning direct service delivery, commissioning, strategic planning, and community leadership, provide numerous levers to build local resilience.

As noted above, responses related to infrastructure and the built environment of the public services to are addressed in more details in the other relevant sections of this report (e.g. see 4.10 Built environment and communities and *4.9 Transport*)

Direct control

- **Education services:** Implement physical adaptation measures for local authority-maintained school grounds, such as installing Sustainable Drainage Systems to manage surface water flooding, planting trees and creating green spaces for shade, cooling, and biodiversity enhancement, and adopting water-efficient landscaping techniques to conserve water during droughts. These actions align with the DfE's National Education Nature Park initiative[302]. For local authority-operated or directly contracted home-to-school transport services, review and adapt operational plans to account for climate risks. This includes developing alternative routes to avoid flood-prone areas, ensuring vehicles are suitable for operating in extreme heat (e.g., with effective air conditioning), and having clear communication protocols with parents during weather-related disruptions.
- **Justice services:** Where YOT activity involves community-based fieldwork, local authorities can assess how extreme heat, flooding or severe weather could disrupt staff travel, outdoor supervision and engagement with young people, and put in place measures to maintain safe and continuous delivery (for example, flexible working arrangements, alternative meeting locations or revised visit protocols).
- **Emergency services (local authority role in LRFs and emergency planning):** Local authorities must lead and actively participate in comprehensive climate risk assessments within Local Resilience Forums (LRFs) and equivalent, ensuring these assessments incorporate the latest climate projections and consider the potential for compound and cascading impacts. Local authorities must develop, regularly review, and test local authority-specific emergency plans and departmental business continuity plans, ensuring they are informed by future climate projections and address a wide range of climate hazards. These plans should also be integrated with multi-agency plans developed through the LRF.

[302] The National Education Nature Park: how to get involved – The Education Hub

Procurement and commissioning & commercialisation

Local authorities wield significant purchasing power and are responsible for commissioning a wide range of public services. These functions offer powerful levers to drive climate resilience beyond directly controlled assets and operations.

- **Education services:** In contracts for home-to-school transport, local authorities can include requirements for operators to use vehicles suitable for extreme weather (e.g., with effective air conditioning for heatwaves), to have contingency plans for route disruptions due to flooding or storms, and to provide flexible services during such events. For outsourced educational support services (e.g., catering, cleaning, sports facilities, grounds maintenance), contracts should specify climate-resilient operational practices, such as water-wise grounds maintenance, and business continuity plans that account for climate disruptions.
- **Justice services:** When commissioning services that support young offenders or contribute to preventative work (e.g., from voluntary sector organisations or specialist providers), local authorities should include climate adaptation considerations in their commissioning frameworks.
- **Emergency services:** When commissioning services that support emergency response (e.g., volunteer coordination, emergency catering, temporary accommodation), contracts should require providers to demonstrate robust business continuity plans that address climate risks and ensure service delivery under pressure.

Showcasing

- **Education services:** Local authorities can develop and showcase exemplary green infrastructure projects on local authority-maintained school grounds, such as outdoor classrooms designed for weather resilience, biodiversity-rich rain gardens, or tree planting schemes for shade and cooling and link these to the curriculum and the National Education Nature Park[302].
- **Emergency services:** Local authorities can champion innovative approaches to community resilience building within LRFs, such as co-designed local emergency plans.

Partnerships

- **Education services:** Local authorities can forge strong partnerships with academy trusts, diocesan boards, free school proposers, and individual school governing bodies to coordinate adaptation efforts across all local schools, regardless of their governance model. This could involve sharing risk assessments, developing joint adaptation plans for school clusters, or collaborating on bids for adaptation funding. Local authorities can also support schools in developing their own climate adaptation plans, for example, through the DfE's Climate Action Plan initiative, by providing local data, guidance, and facilitating peer-to-peer learning[299].

- **Justice services:** Local authorities can strengthen existing multi-agency partnerships with the police, health services, housing providers, children's services, and community and voluntary sector organisations to provide holistic and climate-informed support to young offenders and those at risk of offending. This includes sharing information on climate vulnerabilities affecting shared clients and collaborating on the resilience of any shared facilities or jointly delivered services.
- **Emergency services:** Local authorities play a central leadership role in Local Resilience Forums (LRFs), ensuring that future climate risks and adaptation strategies are embedded across multiagency emergency planning and preparedness. This includes championing the use of climate projections in Community Risk Registers and strategic plans
- **Strengthening local coordination and response:** Local authorities shape place by convening and coordinating local partners. For emergency response and justice services, this includes ensuring clear local arrangements between councils, police, courts, YOTs, health services and voluntary organisations, so roles remain clear and responses are joined up during climate-related incidents.

Involving, engaging & communicating

- **Emergency services:** Local authorities must (under the CCA 2004) warn and inform the public about climate-related risks and what to do in an emergency. This goes beyond issuing alerts during an incident and includes building wider community resilience through clear, timely and accessible advice on preparedness for floods, heatwaves and storms. In practice, this can include public heat health messaging, flood preparedness guidance for households and businesses, community briefings before high-risk seasons, targeted communication for vulnerable groups, and working with voluntary and community organisations to ensure information reaches those least able to respond independently.

Nation-specific considerations

- **England:** Local authorities operate within the context of national strategies such as the DfE's Sustainability and Climate Change Strategy[299] and the MoJ's Climate Change Adaptation Strategy[303]. Local Resilience Forums are the primary mechanism for multi-agency emergency planning.
- **Scotland:** Emergency service adaptation actions are detailed within SNAP, with specific strategies for Police Scotland and the Scottish Fire and Rescue Service[304].

[303] Climate change adaptation strategy 2024: MOJ
[304] Outcome Three: Public Services and Infrastructure (PS) - Climate change: Scottish National Adaptation Plan 2024-2029


MARNE
ZEEBRUGGE

4.12 Culture

What is the culture system? The culture system includes many types of heritage (e.g. historic buildings, scheduled monuments, archaeological sites, registered parks and gardens, historic battlefields, protected shipwrecks, and the collections held within these places). It also includes large, protected landscapes, National Parks, and National Landscapes (formerly called Areas of Outstanding Natural Beauty). Intangible heritage sits alongside these physical places (e.g. social practices, traditions, values, and language). These cultural elements link closely to the sites and landscapes where they developed. [305,306]

What are the key climate risks? Increased frequency and intensity of rainfall, along with sea-level rise and coastal erosion, pose significant threats to cultural assets. Impacts include structural damage to historic buildings (foundations, walls, interiors), destabilisation of archaeological sites, loss of coastal heritage sites through inundation, damage to collections, and disruption to access for landscapes and sites[17]. Hotter, drier summers and an increased frequency of heatwaves result in thermal stress on building materials (causing expansion and contraction), desiccation of organic archaeological remains, an elevated risk of wildfire in historic landscapes and parklands, damage to sensitive historic interiors and collections, and considerable visitor discomfort. The displacement of communities due to climate impacts can lead to the loss of language, traditional skills (such as unique farming practices), and cultural practices intrinsically tied to specific places. [307,308]

What does a resilient culture system look like? In a well-adapted culture system, comprehensive and regularly updated climate change risk assessments are routinely undertaken for all types of heritage assets. Where necessary, climate adaptation is systematically embedded within all relevant conservation approaches, management plans, and operational practices for both heritage sites and protected landscapes. Where necessary, loss and change is managed proactively and with community involvement. [309]

[305] Protected Landscapes Targets and Outcomes Framework
[306] Advancing cultural heritage governance for climate change adaptation - Priestley Centre for Climate Futures
[307] Response to second call for evidence to inform CCRA4-IA technical report - March 2025
[308] Wales' 'national treasures' including castles are at 'serious and constant risk' due to climate change – Future Generations Commissioner makes call for better protection of our heritage assets - Future Generations Wales
[309] Researching Heritage, Climate Change and Environment | Historic England

4.12.1 What is the role of local authorities in adapting the culture system?

Local authorities have direct control over a significant portfolio of cultural assets, including local authority-owned historic buildings (such as museums, libraries, town halls, and community centres), public parks, and land within or adjacent to protected landscapes. Local authority cultural assets do not stand alone. They connect with the wider built environment and land system, which share similar climate risks and adaptation needs. Relevant points are explained in more detail in *4.2 Land* and *4.10Built environment and communities* chapters.

Direct control

- **Assessing heritage risks:** Local authorities should aim to understand how each asset may be affected by heat, flooding, storms, damp, or changing ground conditions. This should include the condition of the building, local climate projections, and how the asset is used.
- **Managing local authority-owned/managed heritage assets:** Local authorities should prepare a practical plan that sets out how it will respond to climate risks, and then put the actions in this plan into place. This includes setting priorities, assigning responsibilities, securing resources, and making sure progress is reviewed and updated regularly. Guidance from national bodies like Historic England (e.g., on energy efficiency[310]), Historic Environment Scotland , and Cadw (Welsh Government's historic environment service) can be followed.
- **Management of local authority-owned land in/near Protected Landscapes:** Local authorities often own significant landholdings, such as county farms or country parks, within or adjacent to National Parks and National Landscapes. The management of this land should be aligned with the objectives of the respective Protected Landscape management plans to enhance climate resilience at a landscape scale.

Procurement and commissioning & commercialisation

- **Resilience clauses in lease agreements:** For local authority-owned heritage assets that are leased to third parties (e.g., community groups, cultural enterprises, commercial tenants), local authorities could incorporate specific climate resilience clauses into lease agreements[311]. These clauses could require tenants to undertake regular climate risk assessments for the property, implement agreed-upon adaptation and maintenance measures to a defined standard, and share data on climate impacts and any adaptation actions taken.
- **Funding and commissioning:** Where local authorities fund or commission assets they do not own, similar requirements can be set through grant conditions

[310] Current Guidance and Advice | Historic England
[311] Heritage Building Retrofit Toolkit

or contracts, including basic risk assessment, proportionate adaptation actions, and reporting.

Place shaping

- **Integrating cultural heritage adaptation into planning policy:** Local authorities should embed robust policies for the adaptation of cultural heritage and protected landscapes within their Local Plans, SPDs, and, where relevant, Conservation Area Appraisals and Management Plans.
- **Skills and guidance:** Local authorities need conservation and planning staff with a clear understanding of climate risks and adaptation. Clear guidance is required on what changes to heritage assets are acceptable to support climate adaptation.

Showcasing

- **Piloting innovative solutions:** Local authorities should seek opportunities to support or lead pilot projects that test novel adaptation materials, innovative conservation techniques, or new management models tailored to the specific needs of different types of cultural assets and landscapes. This could involve collaborating with research institutions, heritage bodies, or technology providers. Examples include the UNESCO Climate Change & UNESCO Heritage pilot project, which involves sites like North Devon Biosphere, Fforest Fawr, and Hadrian's Wall, aiming to develop improved joint working and data tools[312]. Historic Environment Scotland's trials of "soft-capping" techniques for unroofed structures provide another instance of innovation in practice[313].

Partnerships

- **Collaboration with national bodies and agencies:** Local authorities should maintain and strengthen working relationships with national heritage bodies and environmental agencies. These partnerships provide access to specialist expertise, authoritative guidance, crucial climate data, and potential funding streams for local cultural heritage adaptation projects. Historic England's Building Climate Resilience Through Community Landscapes and Cultural Heritage (Clandage) project, which involves working with Staffordshire Record Office and other local partners to capture community experiences of historic adaptation, exemplifies such collaboration[314].
- **Working with private owners and cultural providers:** A significant portion of cultural heritage is in private ownership. Local authorities should proactively engage with private owners of heritage assets, as well as with independent

[312] Climate Change and UNESCO Heritage | UNESCO in the UK
[313] Historic Environment Scotland - Adaptation Scotland
[314] Building Climate Resilience Through Community Landscapes and Cultural Heritage ('Clandage') | Historic England

museums, galleries, and other cultural organisations, to raise awareness of climate risks and to support their adaptation efforts. This support can take the form of providing advice, signposting to relevant guidance and funding opportunities, and facilitating local networks for peer-to-peer learning.

Involving, engaging & communicating

- **Involving people and ideas for local solutions:** Local authorities can support citizen science to monitor climate impacts on heritage. They can also work with communities to shape adaptation responses, including documenting heritage at risk or supporting managed change or relocation where assets cannot be sustained.

Nation-specific considerations

- **England:** Historic England is the government's statutory advisor on the historic environment, providing guidance, research, and grants. Natural England advises on landscape and nature conservation, including within Protected Landscapes. The Environment Agency leads on flood and coastal erosion risk management. The Protected Landscapes Targets and Outcomes Framework sets ambitions for climate mitigation and adaptation within National Parks and National Landscapes[305]. Local Nature Recovery Strategies are a key mechanism for landscape-scale adaptation.
- **Scotland:** Historic Environment Scotland (HES) is the lead public body for the historic environment, responsible for a large estate of properties in care and providing guidance and research. NatureScot (formerly Scottish Natural Heritage) leads on natural heritage. SEPA deals with flood risk and environmental regulation. HES has undertaken significant work on assessing climate risks to its estate and developing adaptation strategies.
- **Wales:** Cadw is the Welsh Government's historic environment service, managing sites and providing advice[308]. Natural Resources Wales is the principal environmental regulator and advisor. The Historic Environment and Climate Change in Wales Sector Adaptation Plan aims to increase knowledge, capacity, and resilience[315]. There is also a focus on the impact of climate change on intangible heritage, including the Welsh language and traditional practices.
- **Northern Ireland:** The Department for Communities: Historic Environment Division is responsible for recording, protecting, and promoting the historic environment. Ulster Architectural Heritage is one of the key charity partners, involved in the Heritage at Risk Northern Ireland project[316].

[315] Adapting to Climate Change | Cadw
[316] Top 10 Heritage at Risk in NI


AMBULANCE
Coins & Cards

4.13 Health

What is the health system? The system includes **health and social care** - the direct delivery of clinical and care services and the infrastructure supporting them. Social care, while closely interconnected with health services, often involves commissioning by local authorities and delivery through a mixed economy of public, private, and voluntary providers. It also includes **population health**, which focuses on the overall health status of communities, preventative measures, and addressing health inequalities. [317,318]

What are the key climate risks? Climate change poses a number of risks to the system: [319,320]

- **Risks to health and social care delivery:** Extreme weather events like floods and storms can directly damage hospitals, care homes, and clinics, rendering them non-operational or reducing their capacity[121]. Heatwaves pose a significant risk to healthcare and care settings through overheating of buildings, affecting wards, operating theatres, and residential care, increasing risks to patient safety, resident wellbeing and staff wellbeing, productivity and absences. Heatwaves can also cause critical system failures, such as the IT outages and affect heat-sensitive medicines. Extreme weather can also disrupt transport networks, preventing patients and staff from getting to services and workplaces. It can also disrupt adult and children's social care and safeguarding activity (e.g., home visits, community-based support, and urgent placements), particularly where staff access, communications or care-provider capacity is reduced. Events like heatwaves and floods typically lead to a surge in demand for emergency services and hospital admissions, placing additional strain on already pressured services.
- **Risks to health from heat:** High temperatures can lead to a range of heat-related illnesses, including heat exhaustion and heatstroke, which can be fatal, particularly for vulnerable groups (e.g. older adults, young children and people with long-term health conditions). Extreme heat can also disrupt daily activities, reduce productivity, and impact mental wellbeing, leading to increased stress and anxiety.
- **Other risks to people from extreme weather:** Extreme weather events such as flooding and storms can lead to physical injuries, as well as knock-on mental health impacts from trauma, loss of property or displacement. Disruption to energy and water supply can cause further health problems (e.g. when medical home equipment is disrupted). Changes in weather patterns can also lead to air

[317] Devolution and the NHS | Institute for Government
[318] NHS England » What are integrated care systems?
[319] Review Of The Guy's And St Thomas' It Critical Incident
[320] HECC 2023 report. Chapter 9. Climate change and food supply

pollution (e.g. through an increase in ground-level ozone) and increase the appearance of vector-borne diseases (e.g. associated with ticks and mosquitoes).

- **Risks to food safety:** Higher temperatures create more favourable conditions for the rapid proliferation of foodborne pathogens on raw and prepared foods. Power outages caused by extreme weather, or difficulties in maintaining refrigerated conditions during heatwaves, can also compromise food safety.

What does a resilient health and social care system look like? Many of the aspects that characterise a well-adapted health system fall under the built environment and communities and transport systems, as essential buildings need to be adapted and transport routes for staff and emergency services be available. In addition, core services are designed and operated to maintain critical functions during and after extreme weather events. Essential supply chains, for example for medicines, and medical equipment, are assessed for climate vulnerabilities and diversified to strengthen resilience to extreme-weather disruptions. All health and social care staff can identify health risks posed by climate change.

A resilient public health system has robust surveillance and early-warning systems that track climate-sensitive diseases, environmental hazards and the health impacts of extreme weather in real time, and activate clear response protocols for services and the public. It proactively reduces vulnerability and improves equity by identifying and supporting at-risk groups. Strong social networks, community organisations and support systems further help individuals and communities to cope with climate-related events. [321,322]

4.13.1 What is the role of local authorities in adapting the health system?

Local authorities can influence not only their own public health services and the social care they commission, but also the resilience of the wider built and natural environment, the preparedness of communities, and the adaptive actions of other key stakeholders, including private sector businesses and NHS partners.

4.13.1.1 Adapting health and social care: local authority interventions and strategies

Direct control

- **Council-owned care homes and other social care facilities:** Many local authorities retain ownership of some care facilities or other buildings used for social care purposes. For these assets, local authorities can directly implement

[321] Operational framework for building climate resilient and low carbon health systems
[322] Public health and climate change: How are local authorities preparing for the health impacts of our changing climate? | Journal of Public Health | Oxford Academic

adaptation measures. This includes retrofitting buildings to improve thermal comfort during heatwaves (e.g., through passive cooling strategies like shading, improved ventilation or active cooling where required and appropriate) and to enhance resilience to flooding (e.g., by installing flood barriers, raising electrical sockets, using water-resistant materials).

- **Local authority-operated fleets for social care transport:** Local authorities often operate vehicle fleets for transporting individuals to day centres, medical appointments, or for delivering domiciliary care. Adaptation involves planning alternative travel routes and adjusting schedules during periods of extreme weather that may disrupt transport networks.
- **Heat-adaptive care in commissioned and local authority-run services:** Where local authorities own, operate or commission care services (such as care homes, supported housing or domiciliary care), they have a direct role in ensuring safe, heat adaptive care. This includes advising on good practices and requiring providers to put practical measures in place to protect people receiving care during extreme weather, such as maintaining hydration, providing cooling and shaded spaces, identifying residents at higher risk, and adjusting care routines during heatwaves.[323] Requirements can be set through contracts, service specifications and monitoring arrangements.
- **Staff wellbeing and safety:** Protecting the local authority's own health and social care workforce is paramount. This includes developing and implementing specific heatwave and extreme weather plans for staff, particularly those working outdoors (e.g., grounds maintenance at care homes).
- **Public health and environmental health functions:** Local authorities have direct responsibilities for food safety and environmental health[324]. This includes inspecting food premises, enforcing food hygiene standards, and providing advice and certification to food businesses. As temperatures rise, these powers can be used to ensure food providers have appropriate measures in place to prevent food spoilage and bacterial growth during warm weather.

Procurement and commissioning & commercialisation

- **Embedding climate resilience in contracts for commissioned social care services:** Local authorities can integrate climate adaptation requirements into their commissioning and contracts for care services. In the care sector, this should place a strong emphasis on extreme heat, including requirements for buildings that avoid overheating, clear heatwave response plans, and staff awareness of heat-related risks for residents.

[323] Supporting vulnerable people before and during hot weather: social care managers - GOV.UK
[324] Local Authority Capacity and Capability: Annex D LAs EH and TS Roles and Responsibilities | Food Standards Agency

- **Supporting providers to adapt:** Many care providers, especially smaller organisations, may lack the resources or expertise to implement comprehensive adaptation measures. Local authorities can play a supportive role by providing guidance, training, and access to resources on climate risks, vulnerability assessment, and practical adaptation options relevant to care settings.

Place shaping

- **Planning policies for new health and social care facilities:** Through their Local Plans and development management decisions, local authorities can ensure that new hospitals, care homes, GP surgeries, and other health and social care facilities are sited in locations with low exposure to climate risks, such as avoiding floodplains or areas prone to coastal erosion, or are designed and constructed to high standards of resilience if development in higher-risk areas is unavoidable.
- **Local heat and extreme weather action plans:** Local authorities should have clear, locally tailored heat and extreme weather action plans in place. These plans provide a practical framework for protecting health during heatwaves, cold spells, flooding, storms, and other severe weather events.
- **Increasing urban tree canopy:** Local authorities can develop and implement policies and programmes to significantly increase urban tree canopy cover, using species that are tolerant of urban conditions and future climate stresses. Trees provide shade and evaporative cooling, improve air quality, and help manage surface water, contributing both to wider urban cooling and to the protection of sensitive care settings[325].
- **Areawide urban cooling measures:** In addition to increased tree canopy cover, local authorities can retrofit existing urban areas to reduce extreme heat across neighbourhoods. Measures such as increasing sustainable drainage systems and enhancing parks and streetscapes (e.g. landscape planters)[326] help reduce the urban heat island effect. Measures that reduce extreme heat across neighbourhoods are particularly important for nearby health and social care facilities, where people are more vulnerable to overheating.

Showcasing

- **Pilot projects for resilient health/social care infrastructure:** Local authorities can use their own assets or work with partners to pilot and demonstrate innovative adaptation measures. For example, trialling advanced passive cooling technologies in a council-run day centre or implementing a novel flood protection scheme for a community health hub. The lessons learned from such pilots can then be disseminated to other providers.

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[325] Trees: The critical role of local authorities to protect and expand the urban forest | LocalGov
[326] Adapting public space to Climate Change

Partnerships

- **Collaboration with NHS bodies (Trusts, Integrated Care Boards in England, Health Boards in devolved nations):** Local authorities should work with NHS partners to conduct joint local climate-health risk assessments and develop integrated adaptation plans that span both health and social care services. NHS Green Plans[327], which all NHS organisations in England are required to have, explain how NHS organisations will deliver net zero commitments and adapt to climate change. These Green Plans should be developed with engagement from local authorities and other local partners to ensure alignment and identify opportunities for joint action. Climate adaptation considerations, including risks to health and social care services and vulnerable populations, should be systematically integrated into statutory local assessments and strategies such as Joint Strategic Needs Assessments and Integrated Care Strategies (in England).
- Local authorities and NHS bodies must coordinate their emergency preparedness and response plans to ensure a seamless and effective response for health and social care services during extreme weather events and other climate-related emergencies.
- **Working with private and voluntary sector care providers:** This can involve establishing local care provider forums or networks to share information on climate risks, discuss adaptation challenges, and disseminate good practice.
- **Engaging with Local Resilience Forums (LRFs):** Local authorities should ensure that the specific vulnerabilities of the health and social care sector (including its users and workforce) are fully understood and addressed within multi-agency emergency planning and climate risk assessments.

Involving, engaging & communicating

- **Local monitoring and preparedness:** Local authorities also play a role in local public health preparedness, including contributing to monitoring of climate-related health risks such as vector-borne diseases and using locally held service data to identify and support vulnerable residents during extreme weather events. This is typically delivered in partnership with NHS and national public health bodies.
- **Workforce preparedness and guidance:** Local authorities can support care providers by developing and sharing practical guidance for care home managers, domiciliary care coordinators and frontline staff. This can cover heatwave preparedness, flood safety procedures, and infection prevention and control during and after extreme weather, helping staff to recognise risks, respond safely, and protect both themselves and the people they support.

[327] Greener NHS - Organisations

- The NHS England's adaptation framework for NHS organisations, while targeted at the NHS, provides principles for working together and engaging stakeholders that are broadly applicable and can inform local authority approaches[328].

4.13.1.2 Adapting population health: local authority interventions and strategies

Beyond ensuring the resilience of direct health and social care services, local authorities have a broader and equally vital role in adapting population health to the impacts of climate change. This involves preventative measures, addressing the wider determinants of health that are affected by climate change, and empowering communities to build their own resilience.

Direct control

- **Preventing and managing vector-borne diseases**: Local authorities help prevent and manage outbreaks of diseases spread by insects, such as mosquitoes and other vector-borne diseases. Councils must follow the national contingency plan for invasive mosquitoes. The UK Health Security Agency (UKHSA) sets out these requirements[329]. This work includes monitoring local areas and taking action to stop these insects from spreading.
- **Public health services and campaigns:** Local authorities are responsible for delivering a range of public health services. This includes providing timely and accessible advice to the public, especially vulnerable groups, during heatwaves (e.g., on staying cool, hydration, checking on neighbours) and cold weather periods.
- **Management of local authority-owned public spaces (parks, green spaces):** Local authorities manage public parks and other green spaces, which are critical assets for population health and climate adaptation. They can adapt these spaces to provide enhanced cooling benefits during hot weather (e.g., through strategic tree planting for shade, installation of water features) and to improve flood resilience (e.g., by creating flood storage areas or using permeable surfaces).

Procurement and commissioning & commercialisation

- **Commissioning public health services that incorporate climate resilience:** When commissioning public health services (e.g., smoking cessation, weight management programmes, mental health support services, substance misuse services), local authorities can ensure that providers consider the climate vulnerabilities of their target populations and integrate adaptation messaging or support into their service delivery. The Social Value Model (PPN 002) includes "Wellbeing" as a key theme, with illustrative examples such as supporting

[328] NHS England - A climate adaptation framework for NHS organisations in England
[329] National contingency plan for invasive mosquitoes - GOV.UK

smoking cessation and diabetes prevention programmes, which can be linked to reducing vulnerability to climate impacts[330].

Place shaping

- **Strategic land-use planning:** Planners can use the Joint Strategic Needs Assessments (JSNA) to guide their work. If the JSNA identifies local climate or heat risks, planners can use this existing evidence. They do not need to gather new data to create adaptive planning policies or Supplementary Planning Documents. In addition, Health Impact Assessments for major developments could become standard practice. These assessments should look at the health impacts of climate change and check if the proposed adaptation measures are suitable.
- **Housing policy:** Local authorities have a role in enforcing minimum energy efficiency standards in the private rented sector, which helps protect tenants from fuel poverty and the health impacts of cold homes in winter and overheating in summer.

Showcasing

- **Piloting and showcasing public-health-focused adaptation:** Local authorities can work with public health teams, NHS partners and community organisations to pilot and showcase adaptation approaches that protect health during extreme weather. Examples include testing heatwave support models for vulnerable residents (such as welfare checks, cool spaces and targeted advice), piloting neighbourhood-level cooling measures around care settings or health facilities, or trialling community food and hydration schemes during heat events. These pilots can be used to build evidence, demonstrate what works in practice, and inform wider public health planning and commissioning.

Partnerships

- **Working with local businesses:** Local authorities can engage with local businesses to encourage them to implement climate resilience measures that also protect employee health and contribute to public wellbeing. This might include adapting outdoor working practices during extreme heat, ensuring business premises (especially those open to the public, like shops or cafes) offer cool refuges, or contributing to local greening initiatives.
- **Integrated Care Partnerships (ICPs) in England:** Local authorities should actively use their statutory role within ICPs to champion and drive population health approaches to climate resilience [331]. This involves ensuring that Integrated Care Strategies and JSNAs fully account for the impacts of climate change on the

[330] Procurement Policy Note 002: The Social Value Model
[331] Integrated Care Partnerships: Driving the future vision for health and care | LGA

wider determinants of health and promote collaborative action across health, social care, and other local government services to address these.

Involving, engaging & communicating

- **Public health communication on climate risks:** Local authorities have an important role in communicating practical public health advice linked to climate change. This includes guidance on food hygiene in warm weather, staying hydrated, keeping homes cool during heatwaves, and recognising early signs of heat-related illness.
- **Raising awareness of emerging health risks:** Local authorities can also provide clear information on less familiar climate-related health risks, such as ticks and insect bites, including how to reduce exposure, recognise symptoms, and know when to seek medical advice.
- **Partnering with schools and educational institutions:** Collaboration with schools can help raise awareness of climate change and its health impacts among children and young people, integrate climate-health education into curricula, and adapt school premises (e.g., creating cooler classrooms, greening playgrounds).

Nation-specific considerations

- **England:** The Integrated Care Systems (ICSs) and their associated Integrated Care Partnerships (ICPs), in which local authorities are key statutory partners, are intended to join up health, social care, and public health services. These structures provide a crucial platform for collaborative climate adaptation planning and action, particularly through Joint Strategic Needs Assessments and Integrated Care Strategies. NHS England's 4th Health and Climate Adaptation Report[64] and the NHS Green Plan Guidance[327] set out the direction for NHS adaptation. Local authorities need to align their local health and social care adaptation efforts with these NHS strategies, particularly where services are co-dependent or populations overlap. The UK Health Security Agency plays a key role, for example through its national Adverse Weather and Health Plan[63] and its work with local Directors of Public Health to support adaptation and minimise health inequalities.
- **Scotland:** Public bodies in Scotland, including local authorities and NHS Health Boards, have statutory climate change duties that encompass adaptation. NHS Health Boards are required to complete Climate Change Risk Assessments and develop and implement Adaptation Plans to ensure service resilience. Public

Health Scotland has a role in supporting the social care sector to respond to the climate emergency and produces an Adverse Weather and Health Plan[332].

- **Wales:** Local authorities play a key role in Public Services Boards (PSBs), which are statutory bodies responsible for improving local economic, social, environmental, and cultural well-being, including through climate risk management. The Welsh Government has developed a specific "Health and social care climate adaptation toolkit" to guide local authorities and PSBs in assessing risks and developing adaptation strategies for the sector[68].
- **Northern Ireland:** The health system in Northern Ireland is different from the rest of the UK. Health and Social Care Northern Ireland (HSCNI)[333] acts as the NHS equivalent. It sits directly within the government health department. The Northern Ireland Public Health Agency[334] (PHA) also sits under HSCNI. The PHA works with local Health and Social Care Trusts to deliver public health services and adapt to climate risks.

[332] PHS adverse weather and health plan 2024–2027 - PHS adverse weather and health plan 2024–2027 - Publications - Public Health Scotland
[333] Health and Social Care | hscni.net
[334] HSC Public Health Agency

4.14 Economy and finance

What is the economy and finance system? The economy and finance system is a complex interaction of businesses (from SMEs to large corporations), financial institutions (bank branches, credit unions, insurance providers), and macroeconomic factors (employment, investment, public finances, productivity).

What are the key climate risks? Climate change poses a number of risks to the economy and finance system: [17,335,336,337,338,339]

- **Risks to domestic and overseas physical assets of UK businesses:** Flooding and coastal erosion represent a threat. Business premises, essential equipment, and valuable stock are vulnerable to direct damage, leading to significant repair costs, prolonged business interruption, and, in severe cases, the need for permanent relocation. Heatwaves can damage heat-sensitive electronic equipment and machinery, significantly increase operational cooling costs, and compromise the structural integrity of buildings. Prolonged droughts and changes in precipitation patterns can severely impact businesses that depend on consistent water supplies for their operations, such as manufacturing, agriculture, and the hospitality sector.
- **Risks to domestic and international supply chains, commutes and resource inputs of UK businesses:** Extreme weather events can cause substantial disruption to transport networks, including roads, railways, ports, and airports, disrupting domestic and international supply chains as well as impacting worker attendance (due to their inability to commute to work). Altered weather patterns can affect the availability of other critical natural resources.
- **Risks to productivity and availability of labour in the UK:** High temperatures in workplaces, whether offices, factories, or outdoor sites, as well as during the night at home (impacting sleep) can reduce worker productivity, increase the likelihood of errors, absence from heat-related illnesses and pose direct health risks.
- **Risks to financial institutions and the financial system:** More frequent extreme weather is driving up insurance claims, straining insurers' capital and making cover unaffordable or unavailable in some high-risk areas, particularly for new-build homes and commercial properties not covered by Flood Re[340]. This increases risks for lenders, as uninsured or devalued assets become harder to

[335] Risks to health, wellbeing and productivity from overheating in buildings
[336] CCRA3 Briefing Business
[337] The FCA's Adaptation Report
[338] Key findings cost of living climate change
[339] What will climate change cost the UK risks impacts mitigation
[340] Flood Re - A flood re-insurance scheme

mortgage, and increases credit risks for banks from households and businesses facing asset damage, loss of income or declining collateral values.

- **Risk to household finances:** Households face rising costs for essentials - including food, energy, water and insurance - as climate impacts disrupt agriculture, supply chains and infrastructure and increase some insurance costs.
- **Risks to UK macroeconomic performance and stability:** Due to impacts described above, climate change could reduce UK economic output.
- **Risks to public finances:** Climate impacts are increasing costs for national and local governments, including emergency response, infrastructure repair and upgrades, increased insurance costs, and rising demand for health and social care, while simultaneously reducing tax revenues in affected areas.

What does a resilient economy and finance system look like? Resilient UK businesses understand their current and future climate risks, and fully integrate adaptation into core planning and investment decisions. Their physical assets are located, designed or upgraded to withstand local hazards, and their supply chains are diversified and stress-tested to manage climate-related disruption. Operations and workforce practices are adapted to changing conditions - for example, by protecting staff during heatwaves or reducing water use during scarcity. Businesses, especially SMEs, can access information and affordable finance and insurance products that support investment in adaptation and provide cover for residual climate risks.

A resilient UK finance system systematically embeds climate-risk assessment into lending, investment and insurance decisions, based on high quality climate data and modelling. It also ensures that appropriate insurance products that cover a range of climate-related risks remain available and affordable for local households and businesses.

A resilient macroeconomic system remains stable despite climate shocks, with national and local public finances able to absorb impacts and fund adaptation. In a resilient macroeconomic system economic losses from extreme weather do not increase substantially over time, and ensures that vulnerable communities are protected so climate risks do not deepen existing inequalities. [341,342]

4.14.1 What is the role of local authorities in adapting the economy and finance system?

Local authorities can implement a range of interventions to manage risks and realise opportunities within the economy and finance system. Adaptation in other systems (e.g. the built environment) are also essential for businesses and banks, and insurers rely on adaptation across all systems to keep losses within insurable bounds.

[341] Investing in climate adaptation | Barclays Private Bank
[342] Chapter 17: Decision-Making Options for Managing Risk

4.14.1.1 Adapting businesses: local authority interventions and strategies

Direct control

- **Adaptation of local authority operations supporting businesses:** It is important that local authority services which are critical to the day-to-day operations of local businesses are themselves climate resilient. This includes, for example, ensuring that commercial waste collection schedules can adapt to disruptions, and that maintenance of the public realm in business districts (e.g., drainage, street trees for cooling) is undertaken with climate resilience in mind. The role of local authorities in ensuring resilient transport, energy and telecoms system is also set out in previous chapters.
- **Resilient local authority-owned commercial properties:** Local authorities should ensure that any commercial properties or industrial estates they own or manage are well adapted.
- **Local authority fleet and business travel:** Local authorities should ensure their own vehicle fleets and business travel policies are resilient to climate-related disruptions. This could involve ensuring the resilience of EV charging infrastructure at local authority depots, or developing alternative travel plans for their staff who provide essential support services to businesses (e.g., environmental health, trading standards) during extreme weather events.

Procurement and commissioning & commercialisation

- **Commissioning resilient infrastructure for economic development:** When local authorities commission new infrastructure intended to benefit local businesses, such as new business parks, enterprise zones, or transport links serving industrial areas, climate resilience must be a core design and specification requirement from the outset.
- **Supporting resilient sourcing:** Local authorities can promote sourcing from businesses that can demonstrate strong adaptation measures. While adhering to procurement law, policies could be developed to give appropriate weighting to suppliers who exhibit robust climate resilience, thereby supporting local businesses that are investing in their own long-term viability.

Place shaping

- **Supporting business adaptation or relocation in high-risk areas:** For existing businesses located in areas facing escalating climate risks, local authorities should develop clear strategies. These may involve supporting businesses to adapt *in situ* where feasible (e.g., through guidance on property-level protection), or, in cases of unavoidable high risk, facilitating managed relocation to safer areas. This could potentially involve financial incentives, land-use swaps, or dedicated support programmes.

- **Creating climate-resilient business environments:** When planning new business parks, industrial estates, or commercial centres, or regenerating existing ones, local authorities should ensure climate resilience is a central design principle.

Showcasing

- **Pilot projects with local businesses:** Local authorities can partner with willing local businesses and developers or site owners to implement innovative adaptation pilot projects. These could involve testing new resilient building materials, water-saving technologies in specific industrial processes, or collaborative local supply chain initiatives designed to reduce climate vulnerability.
- **Demonstrating best practice in local authority estates:** Local authorities should utilise their own commercial building stock or business support centres as exemplars of climate-resilient design, retrofitting, and management. This provides tangible examples that other businesses can visit and learn from.
- **Transparent climate-related financial reporting:** Local authorities should adopt and publicly report on their own approach to managing climate-related financial risks. This transparency can encourage other local public and private sector organisations to follow suit.

Partnerships

- **Business resilience networks and forums:** Local authorities can take the lead in establishing or actively supporting local or regional business resilience networks. These forums provide a platform for businesses to share information, experiences, and best practices, and to collaborate on common adaptation challenges, such as joint procurement of flood defence solutions for a shared industrial estate, or undertaking collective climate risk assessments for a specific business district.

Involving, engaging & communicating

- **Targeted and accessible information and guidance:** Local authorities can provide clear, concise, easily understandable, and tailored information to local businesses, with a particular focus on the needs of SMEs. This information should cover local climate risks, potential business impacts, and practical, cost-effective adaptation options.
- **Promoting the business case for adaptation:** Communication efforts should strongly emphasize the economic benefits of proactive adaptation. This includes highlighting how investment in resilience can reduce future disruption costs, lower insurance premiums, enhance brand reputation, meet customer and investor expectations, and open up new market opportunities.

4.14.1.2Adapting finance: local authority interventions and strategies

Local authorities have very little control over the wider finance sector. However, they can play a role in supporting household finances, particularly by helping residents cope with the financial effects of climate change.

Direct control

- **Emergency financial response and cost recovery:** Local authorities can access the Bellwin scheme[343] to recover a proportion of eligible emergency expenditure following severe weather events such as flooding or storms. While this provides short-term financial relief and supports immediate response, it is reactive in nature and does not fund anticipatory adaptation or long-term resilience building. Section *3.4.1.2 Reforming and ensuring sufficient funding mechanisms* reports on potential for innovation in adaptation funding from the local authority workshops.
- **Welfare assistance schemes:** Local authorities can use Local Welfare Assistance[344] or equivalent schemes to support households affected by climate impacts, such as replacing damaged essential items or covering short-term living costs.

Partnerships

- **Coordinate with utilities and housing providers:** Local authorities can align council action with energy and water companies on affordability, payment support and resilience.

Involving, engaging & communicating

- **Communicating the economic benefits of adaptation:** Local authorities should clearly communicate the wider economic and financial benefits of investing in local adaptation and resilience, both to the public to build support for local authority spending, and to potential private investors to attract funding. This includes highlighting avoided costs, enhanced asset values, and new economic opportunities.

4.14.1.3Adapting macroeconomics: local authority interventions and strategies

Macroeconomic policy sits with national government, but local authorities can support local resilience through their strategic choices. They can also reduce macrolevel risks by managing their own finances well and by supporting household finances during climate-related shocks.

[343] Bellwin scheme of emergency financial assistance to local authorities: guidance notes for claims
[344] Household Support Fund: guidance for local councils

Direct control

- **Climate-resilient local authority financial planning and budgeting:** Local authorities must systematically integrate climate risks and the costs of adaptation into their core financial management processes. This includes medium-term financial strategies, annual budget setting, capital investment programmes, and asset management plans. Such integration should explicitly account for the anticipated increased costs of service delivery, the rising costs of repairing and maintaining local authority-owned infrastructure damaged by extreme weather, and the budget impacts of more frequent emergency response operations. It should also include the costs of adapting existing assets so they can withstand future climate conditions.
- **Investment of local authority pension funds:** Where local authority have influence over the investment strategies of their Local Government Pension Scheme funds (recognising that direct control is often limited by governance structures and fiduciary duties), they should strongly encourage or advocate for these funds to assess and integrate physical climate risks (alongside transition risks) into their investment decision-making processes across all asset classes.
- **Managing local authority insurance portfolios:** Local authorities should conduct thorough reviews of their own insurance policies to ensure adequate and cost-effective cover for climate-related risks to their diverse assets (buildings, infrastructure, vehicle fleets) and operations. This may involve exploring opportunities for collective bargaining with other public sector bodies to achieve better terms, or investigating innovative insurance solutions such as parametric insurance for specific, well-defined risks. They can also access data and intelligence and support from their insurance companies which are well-placed to advise them on future-proofing their assets.
- **Resilient local authority service delivery:** Ensuring the continuity of essential local authority services (education, social care, waste management, transport network maintenance) during and after extreme weather events is crucial for maintaining local economic activity and social stability.
- **Management of local authority land and assets:** Strategic management of local authority-owned land and property can support macroeconomic resilience.
- **Local emergency financial management:** Having robust local authority financial contingency plans to manage the immediate fiscal shocks of major climate events (e.g., emergency spending, loss of revenue) helps maintain local financial stability, which underpins the local macroeconomy.

Procurement and commissioning & commercialisation.

- **Procuring financial services with a climate lens:** When local authorities procure banking services, investment management services for their reserves, or insurance brokerage, they can include criteria that assess the provider's own approach to

climate risk management, their commitment to sustainable finance, and their offerings related to adaptation finance and climate-resilient investments.

Place shaping

- **De-risking investment through strategic land-use planning:** By using their planning policies to steer new development away from areas of high current or future climate risk (e.g., floodplains, coastal erosion zones, areas prone to wildfire), local authorities can significantly reduce the likelihood of future financial losses for homeowners, businesses, and insurers. This proactive approach also helps to protect the stability of the local mortgage market by reducing the number of properties exposed to unmanageable risks[345].

Showcasing

Local authorities can lead by example and showcase successful financial adaptation strategies to inspire and inform others.

- **Highlighting successful adaptation funding models:** Local authorities can showcase successful examples of how they have funded adaptation projects, particularly those involving innovative finance mechanisms like Local Climate Bonds/Community Municipal Investments, blended finance, or public-private partnerships. Sharing these models can help other local authorities and organisations to replicate them.

Partnerships

- **Partnerships with local financial institutions:** Local authorities can work with local banks, building societies, and credit unions. Together, they can look into creating new financial products to support climate resilience. While still rare, councils could explore partnerships to encourage green mortgages that offer better rates for adapted homes. More immediately, they can work with credit unions to offer small loans so local businesses and homeowners can pay for adaptation improvements.
- **Public-private partnerships (PPPs) for adaptation finance:** local authorities can spearhead or participate in PPPs to finance larger-scale local or regional adaptation projects, blending public funds with private investment to deliver projects that might not be viable through either route alone.

Involving, engaging & communicating

- **Engaging residents on Local Climate Bonds (LCBs)/Community Municipal Investments (CMIs)[346]:** If pursuing LCBs/CMIs, local authorities need effective communication strategies to explain the purpose of the investment, the projects

[345] Financial Stability Report - November 2024 | Bank of England
[346] Community Municipal Investment (CMI) / Local Climate Bonds (LCBs) — Green Funding & Finance Finder — Zero Carbon Accelerator

to be funded, the financial returns, and the risks involved, to encourage local participation.

Nation-specific considerations for the economy and finance

- **England:** Local authorities should explore funding opportunities through various national schemes (e.g., Local Growth Fund, Integrated Settlements, specific flood defence grants from EA/Defra) and ensure climate adaptation is integrated into bids. The role of the UK National Wealth Fund and British Business Bank in supporting local adaptation finance should be actively explored by local authorities. The evolving landscape of devolution deals may provide new financial flexibilities or dedicated funding pots for combined authorities that can be used for resilience.
- **Scotland:** Local authorities should consider engagement with the Scottish National Investment Bank and other public funding bodies in Scotland. Mechanisms like the Green Growth Accelerator model[347] could potentially be applied to adaptation projects. Local authorities can focus on Just Transition principles in helping key Scottish industries (e.g., oil and gas, agriculture, fisheries, tourism) to adapt to climate change.
- **Wales:** Local authorities should explore opportunities for collaborative funding through Public Services Boards.
- **Northern Ireland:** Councils will need to work closely with Northern Ireland Executive departments to understand and access funding for adaptation, as direct revenue-raising powers are limited. The PEACE PLUS programme[348] or other cross-border funding initiatives may offer opportunities for certain types of resilience projects.

[347] Accelerating green growth
[348] Peace Plus Programme | The Executive Office

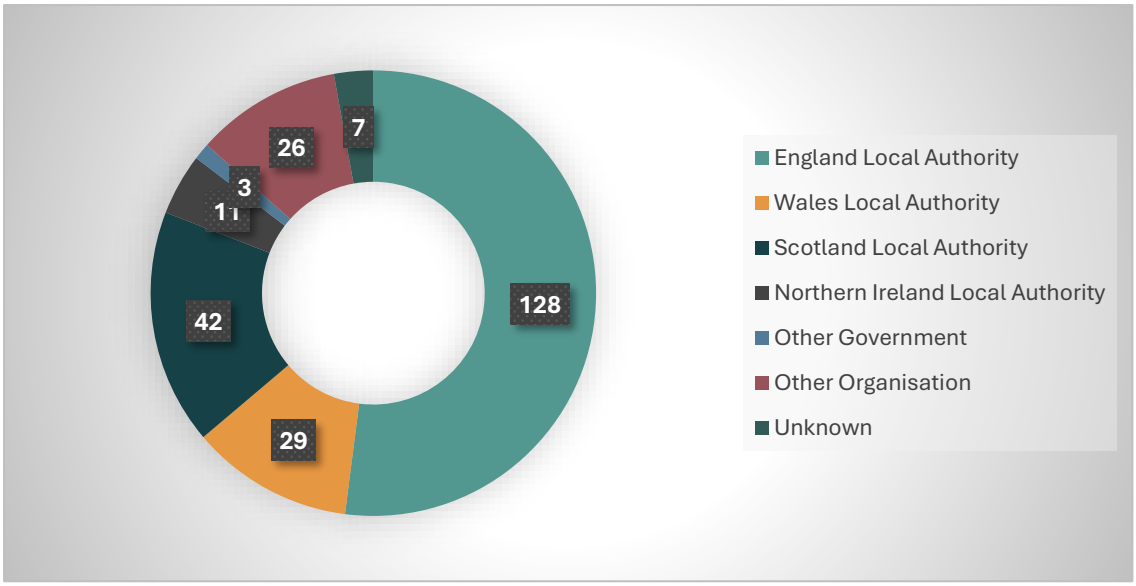
1 Appendix 1: Climate adaptation workshop – summary findings

Online workshops were held on the 2nd and 23rd April 2025 focused specifically on Climate Adaptation for local authorities in the UK. This annexe provides a summary of the results and responses from these two engagements.

1.1 Attendance

Participants at the first webinar included representatives from local authorities in England, Wales and Scotland, as well as other departments and other organisations that work with local authorities on climate adaptation. A second workshop was held specifically for councils in Northern Ireland. This workshop covered both adaptation and mitigation topics, but included similar questions and lines of enquiry for adaptation. Participants were identified through existing local authority networks and forums. Invitations were addressed to "local authority officers working on climate, planning, transport, finance, infrastructure, health, communities and economic development". There were representatives from county, district, metropolitan, combined authorities and PSBs. Representation of local authorities from England, Wales, Scotland and Northern Ireland is presented below.

Figure 3: LA Workshop Participant Categories



1.2 Local authorities' context

A number of context-setting questions were asked of the participants. The results are presented in the graphs below.

Figure 4: Has your council already conducted a climate risk assessment?

Figure 5 shows the priority climate risks identified by officers. These categories are not mutually exclusive, because one risk can affect several systems, for example, flooding can disrupt infrastructure, services, and communities. The graph shows that more than twice as many officers selected flooding as their area's priority climate risk compared with heat.

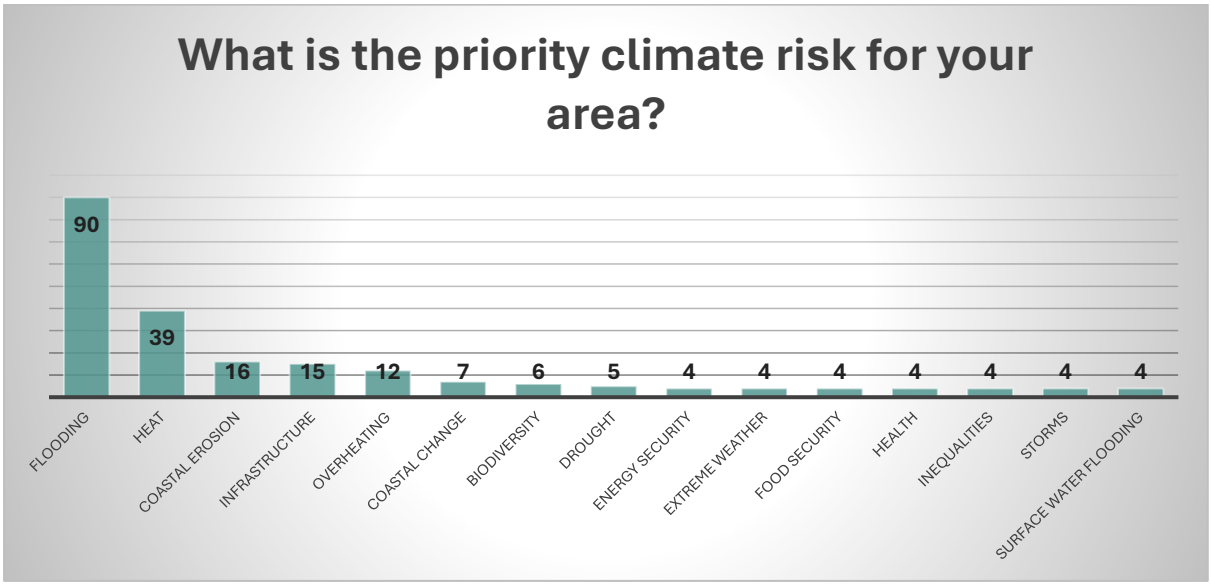


Figure 5: What is the priority climate risk for your area?

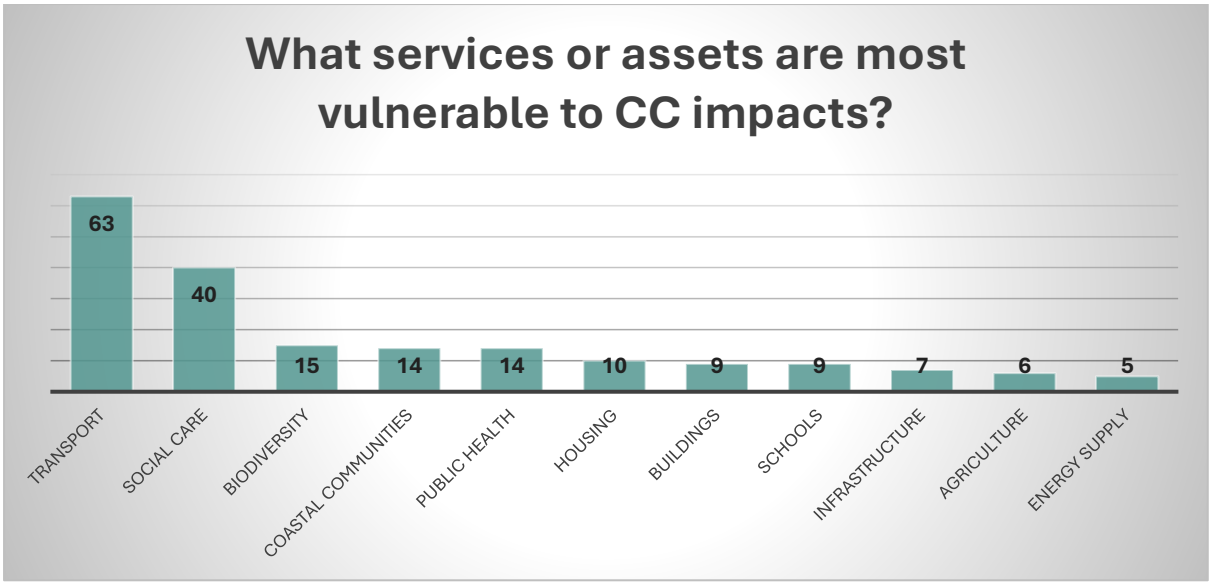


Figure 6: What services or assets are most vulnerable to Climate Change impacts?

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- Daniel Wells
- David Pickup
- Gül Işık
- Ivelin Donchev
- Liam O'Neill
- Lisa from Pexels
- Luciann Photography
- Lynn Elder
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