ICE Insights Paper: how are governments structured to tackle infrastructure climate resilience?

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Overview

Climate resilience is an urgent and complex global challenge, requiring effective governmental structures to mitigate risks, adapt to climate change, and ensure the sustainability of infrastructure, nature, and communities.

Governments play a crucial role in addressing climate resilience by integrating adaptation measures into strategic infrastructure planning and prioritisation, regulatory frameworks, and infrastructure development. Effective governance structures ensure the coordination of policies, investment in resilient infrastructure, and collaboration between various stakeholders.

Different countries have adopted distinct approaches to climate resilience, with governance models ranging from centralised policymaking to decentralised community-led initiatives. Understanding these variations and their effectiveness is vital for improving climate resilience strategies globally.

ICE State of the Nation 2025 highlights growing concerns about the condition of critical infrastructure – particularly ageing highways assets – in the UK, throughout Europe and around the world.[1] The ICE has previously explored climate resilience in infrastructure through its policy reports, including its policy position statement on climate resilience in 2023.[2] This emphasised the need for proactive adaptation strategies, improved governance structures, and investment in resilient infrastructure.

This insights paper examines how governments worldwide structure their policies, institutions and governance systems to tackle infrastructure climate resilience, highlighting successful frameworks and identifying areas for improvement.

The paper combines insights from global experts in infrastructure resilience, including government officials, private sector stakeholders, infrastructure experts, and international and non-profit organisations. The paper also incorporates findings from a desk-based review of existing literature, including government documents and policy reports.

It concludes that to strengthen global infrastructure climate resilience, governments should:

[1] ICE (2025) State of the Nation

[2] ICE (2023) ICE Policy Position Statement: How Can the UK's Infrastructure System Be Made More Climate Resilient

- Establish clear roles and leadership to coordinate infrastructure resilience across all levels of government and avoid fragmentation.
- Set measurable adaptation targets to ensure national plans drive real progress.
- Create coordination platforms to strengthen collaboration between national, regional and local governments.
- Provide dedicated funding, tools and training to local authorities to enable them to assess climate risks and implement effective adaptation plans.
- Engage communities to build public support and integrate local knowledge.
- Embed climate risk into infrastructure planning to address both current and future risks.
- Align public funding with resilience goals and reform appraisal methods to reflect long-term benefits and avoided damages. Incentivise private investment in resilient infrastructure through incentives and regulation.
- Mandate climate risk disclosure and resilience standards to improve transparency and accountability.

In the UK, these recommendations must be translated into concrete, coordinated actions:

- Assign cross-government responsibility for resilience to move beyond Department for Environment, Food and Rural Affairs (Defra) and drive coordinated actions.
- Set clear, actionable targets in National Adaptation Programme to move from restating plans to urgent action and delivering outcomes.
- Fund and require local authorities to adapt to ensure climate resilience is built from ground up.
- Mandate community engagement in adaptation plans to ensure inclusive and locally informed decisions.
- Integrate climate resilience into the 10-year infrastructure strategy to embed resilience in all future delivery.
- Use the Spending Review to allocate sufficient resources for proactive adaptation, treating resilience as a national investment priority.
- Launch a national review of adaptation economics to ensure decisions reflect full long-term value.
- Make reporting under the Adaptation Reporting Power mandatory for infrastructure operators and local governments.
- Adopt resilience standards to ensure infrastructure can withstand climate impacts and deliver reliable services.

What is infrastructure climate resilience, and why does it matter?

Defining climate resilience remains a complex task, as there are a variety of views on what resilience means. Some view it more narrowly, encompassing only adaptation to physical risks, while others argue for a broader interpretation.

Adaptation and resilience are often used interchangeably, but they differ in meanings: adaptation refers to the actions taken to adjust to the actual or expected climate and its effects, while resilience is the broader capacity or ability to anticipate, withstand and recover from its impacts.[3]

This paper focuses on infrastructure climate resilience and follows the definition by the Organisation for Economic Co-operation and Development (OECD), which describes climate-resilient infrastructure as infrastructure that is planned, designed, constructed and operated in a way that anticipates, prepares for and adapts to the changing climate, and can withstand and recover rapidly from disruptions caused by changing climatic conditions throughout

[3] LSE (2022) What is the difference between climate change adaptation and resilience?

its entire lifetime. Climate resilience is relevant to both new assets and existing ones, which may need to be retrofitted or operated differently to account for climate change impacts.[4]

Global efforts to enhance infrastructure climate resilience

Internationally, there is recognition of the importance of climate-resilient infrastructure. The Paris Agreement in 2015 set the Global Goal on Adaptation of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change. At COP28 in 2023, Parties adopted the UAE Framework for Global Climate Resilience, which includes a range of thematic targets, such as increasing infrastructure climate resilience and minimising climate-related impacts on infrastructure by 2030.

The Sendai Framework for Disaster Risk Reduction (2015–2030), adopted by the UN member states, explicitly targets reducing disaster damage to critical infrastructure through developing its resilience by 2030. To support the implementation of the Framework, the United Nations Office for Disaster Risk Reduction (UNDRR) has published the Principles for Resilient Infrastructure[5] and Global Methodology for Infrastructure Resilience Review[6]. The OECD has also been actively involved in research and policy development to promote climate-resilient infrastructure, and informed G20 policymakers about approaches to advance its financing. The G20 Disaster Risk Reduction Working Group has launched the Compendium of Good Practices on Disaster Resilient Infrastructure[7] to showcase innovative approaches towards disaster resilience of new and existing infrastructure and facilitate shared learning.

Strengthening infrastructure resilience is crucial as climate change increases the frequency and severity of extreme weather events, such as heatwaves, heavy rains, floods, droughts, wildfires and hurricane flooding. Over the past two decades, the number of climate-related disasters has nearly doubled compared to the preceding 20 years.[8] In 2024, the climate crisis escalated to unprecedented levels, resulting in the hottest year on record; extreme weather events led to significant damage, including loss of life, displacements, and destruction of critical infrastructure and biodiversity.[9] When infrastructure fails, the cascading consequences are immediate and widespread, revealing that infrastructure is a system of systems that impacts wider society, the economy, and the environment.

Addressing the adaptation finance gap is an economic necessity

According to the reinsurance firm Swiss Re, natural disasters led to an estimated US$318 billion in global economic losses in 2024, a six per cent increase from 2023.[10] At the same time, the UN Environment Programme (UNEP) Adaptation Gap Report 2024 emphasised that financing for adaptation is lagging behind the growing needs, including in the infrastructure sector.[11] According to analysis by the Climate Policy Initiative (CPI), adaptation finance in 2021–2022 accounted for US$63 billion annually, far short of the estimated US$212 billion needed per year by 2030 for developing economies alone.[12]

There is a compelling economic case for investing in climate resilience: it can yield a benefit-cost ratio of approximately 6 to 1. This means that for every dollar invested, six dollars can be saved.[13] Moreover, with the

[4] OECD (2024) G20/OECD Report on Approaches for Financing and Investment in Climate-Resilient Infrastructure

[5] UNDRR (2023) Principles for resilient infrastructure | UNDRR

[6] UNDRR (2025) Global methodology for infrastructure resilience review | UNDRR

[7] DRRWG (2024) Compendium of Good Practices on Disaster Resilient Infrastructure

[8] UN (2021) Adaptation Cannot Be Forgotten Piece of Climate Equation, Secretary-General Stresses, in Remarks to Special Thematic Session on Water and Disasters

[9] World Meteorological Organization (2025) State of the Global Climate 2024

[10] Swiss Re (2025) sigma 1/2025: Natural Catastrophes: Insured Losses on Trend to USD 145 Billion in 2025

[11] UNEP (2024) Adaptation Gap Report 2024

[12] CPI (2023) Annual Finance for Climate Action Surpasses USD 1 Trillion, But Far from Levels Needed to Avoid Devastating Future Losses

[13] UN (2019) For Every Dollar Invested in Climate-Resilient Infrastructure Six Dollars are Saved, Secretary-General Says

worsening climate, maintaining the same resilience level requires more money each year. As the ICE has previously reflected, by failing to invest now, governments are kicking the can down the road for future generations to deal with.[14]

Recent infrastructure failures vividly illustrate the costs of delayed adaptation, from the catastrophic 2024 wildfires that destroyed more than 30% of infrastructure in Jasper, Canada, to extensive 2024 flooding caused by Storm Bert in the UK, which caused power outages for thousands homes and damaged critical infrastructure, and to destructive cyclones across Australia and New Zealand that have repeatedly disrupted critical infrastructure in recent years.

Case study: Cyclone Gabrielle – a wake-up call for infrastructure resilience in New Zealand

In February 2023, Cyclone Gabrielle severely impacted parts of the New Zealand's North Island, becoming the country's most severe weather disaster in decades.

As one of the New Zealand's costliest disasters, with total damage estimated to be NZ$14.5 billion, it exposed significant gaps in resilience to climate-related hazard. Its impacts included[15]:

- *11 deaths and 2,000 people injured*
- *330,000 households lost power*
- *300 houses were red-stickered and 700 houses in government buy-out*
- *30 sections of state highway were completely closed to traffic*
- *90% of mobile towers were offline over 2 days in the worst hit region of Tairāwhiti*
- *2 months of raw sewage pumped into the sea while repairs were underway*

Beyond the immediate destruction, Cyclone Gabrielle revealed systemic weaknesses in how infrastructure is planned and maintained. It demonstrated that proactive investment in resilience, such as upgrading drainage systems or strengthening power communications could have reduced damage and recovery costs. The disaster also highlighted the strength of community-led resilience, as local groups played a critical role in response and recovery.

Adaptation and mitigation are complementary strategies

Adaptation does not receive as much government attention as mitigation, efforts to reduce or prevent greenhouse gas emissions. It does not carry the same political weight, particularly in the context of achieving net zero, and has been described as the 'Cinderella of climate change'.[16] Prioritising mitigation ignores the fact that many climate impacts are locked in: the climate will continue to warm due to past emissions and their long-lasting effects, and countries will need to adapt to manage the effects of unavoidable climate change. Most infrastructure that supports national resilience already exists and will need to be monitored, maintained and retrofitted to withstand current and future impacts of climate change. New infrastructure, including infrastructure enabling a net-zero transition, will also need to be climate-adaptive.

The Intergovernmental Panel on Climate Change (IPCC) notes that 'mitigation and adaptation are complementary strategies for reducing and managing the risks of climate change'.[17] Hence, they should be treated not as competing priorities, but as interconnected imperatives, both requiring effective governance, forward-looking policies, sustained funding, and urgent action.

[14] ICE (2024) 5 Ways the UK Can Better Adapt to Climate Change

[15] PHCC (2023) Cyclone Gabrielle by the numbers – A review at six months

[16] IfG (2024) Adapting to Climate Change

[17] IPCC (2014) IPCC Fifth Assessment Report, Synthesis Report

Many adaptation options exist and are used to help manage projected climate change impacts, but their implementation depends upon the capacity and effectiveness of governance and decision-making processes.[18] Governance defines who makes decisions, how these decisions are made, how different stakeholders coordinate, and whether plans are implemented cohesively or in a fragmented way.

What are the governance structures for infrastructure climate resilience?

Multi-level structures for climate resilience: national leadership

Governance for climate-resilient infrastructure is inherently complex because risks, responsibilities and resources are distributed across multiple layers of government, sectors and communities. Climate resilience requires a multi-level governance approach that aligns actions across national, regional, and local governments.[19] Clear roles and coordination can ensure climate resilience is addressed at the appropriate scale. However, to date, governance for resilient infrastructure has often been fragmented and siloed, with different agencies working in isolation.

At national level, governments set the overall vision, policies, and funding for climate resilience. This often involves central coordination bodies that bring together relevant ministries under a joint adaptation agenda. Without clear national leadership, a central champion and ownership, adaptation efforts can often fall through the cracks. Initiatives can become fragmented, delayed, and lack the coordination and necessary resources, as well as political support, to succeed. Leaders can advocate for resilience as a long-term priority, rather than a short-term fix.

The UK's latest National Adaptation Programme (NAP3) established a cross-departmental Climate Resilience Board to oversee adaptation issues. The Board is co-chaired by the Department for Environment, Food and Rural Affairs (Defra) and the Cabinet Office. However, as the Climate Change Committee (CCC) noted in the recent Adaptation Progress Report, its effectiveness cannot yet be assessed.[20] Few details on the Board's activities are available, and it is yet to be seen what impact it will have.

Currently, adaptation efforts in the UK are led by Defra, which explains the key focus of adaptation on areas under Defra's remit, including flooding and climate change science research.[21] There is a concern that capacity constraints and budget cuts could further strain Defra's work on adaptation. In the meantime, the CCC is clear: the UK government hasn't been moving fast enough to adapt its infrastructure to a changing climate[22].

Other government departments in the UK manage specific climate risks. For example, the Ministry of Housing, Communities and Local Government (MHCLG) has control over housing and building regulations; the Department for Transport (DfT) ensures the resilience of transport infrastructure. The Cabinet Office is home to the Resilience Directorate (established by the Resilience Framework 2022), and the Treasury ultimately decides on departmental spending. As the Institute for Government (IfG) notes, the fact that so many different departments 'own' the relevant policy areas and levers adds complexity to planning and carrying out adaptation projects, like retrofitting housing to handle heatwaves, and preparing infrastructure for extreme weather.[23]

In April 2025, the UK government launched the National Infrastructure and Service Transformation Authority (NISTA), a new body under the Treasury and Cabinet Office. It merges the National Infrastructure Commission (NIC), which

[18] IPCC (2022) Climate Change 2022: Impacts, Adaptation and Vulnerability
[19] OECD (2024) Infrastructure for a Climate-Resilient Future
[20] CCC (2025) Progress in Adapting to Climate Change: 2025 Report to Parliament
[21] LSE/Grantham Research Institute (2024) The 2025 Spending Review Must Prioritise Climate Change Adaptation as a Cross-Cutting Issue
[22] CCC (2025) Progress in Adapting to Climate Change: 2025 Report to Parliament
[23] IfG (2024) Adapting to Climate Change

provided independent advice, and the Infrastructure and Projects Authority (IPA), which oversaw major project delivery. Crucially, one of NISTA's core objectives is to manage and implement the government's 10-year infrastructure strategy (due in June 2025), which will include resilience as one of the pillars.[24] NISTA has also appointed the Council of Expert Advisors, which will provide impartial, expert advice to support strategy implementation. The coming months will test whether this new body can accelerate leadership on climate-resilient infrastructure.

Countries around the world employ different structures for national resilience coordination. For instance, in the Netherlands, in addition to the Ministry of Infrastructure and Water Management, the government established an independent Delta Commissioner to lead the Delta Programme. This nationwide long-term strategy is aimed at safeguarding the country against the escalating risks of climate change, particularly flooding. The position of Commissioner is legally anchored in the 2012 Delta Act, and the Commissioner is responsible for the programme development, working closely with the ministries, provincial and municipal authorities, regional water boards, the business community, social organisations and the public. The Commissioner's duties include providing advice to Cabinet members, which ensures continuity and coordination beyond political cycles; this role also requires presenting a Delta plan annually to Parliament, along with the budget of the Ministry of Infrastructure and Water Management.

Globally, there is a growing recognition of the need for a clear leadership framework for climate adaptation. For example, Infrastructure New Zealand called for the establishment of a single, central authority in the country to drive a consistent adaptation and recovery system based on the successful Queensland Reconstruction Authority (QRA) model.[25] A specialised national entity in New Zealand could unify adaptation planning, ensure policy consistency, and enhance coordination across government levels, while also providing clarity on funding.

Case study: Queensland Reconstruction Authority (QRA) – a model for a centralised authority

Queensland is one of Australia's most climate-exposed states, where climate change intensifies bushfires, floods, cyclones, storms, and heatwaves. In response to the severe infrastructure damage caused by the devastating floods and Severe Tropical Cyclone Yasi in 2011, the Queensland Reconstruction Authority (QRA) was established as a statutory authority. Initially intended as a temporary body, the Authority's success led to its continuation as a permanent body charged with managing and coordinating the Queensland Government's programme of infrastructure renewal and recovery within disaster-affected communities, with a focus on working with the state and local governments to deliver best practice administration of public reconstruction and resilience funds. As of 2024, it has administered a programme of works valued at over AUD$23.7 billion.[26]

QRA's approach has evolved from one of reactive recovery to one that emphasises 'building back better' and enhancing resilience. The Queensland Betterment Fund has enabled local councils to upgrade infrastructure to a more resilient standard. It has approved over 750 projects across 70 local government areas, with a total value exceeding AUD$533 million. This fund has shown that investing in resilient infrastructure upfront can result in substantial savings by avoiding reconstruction costs.

To ensure recovery spending delivered lasting benefits, QRA introduced a Value for Money Strategy that evaluated projects not only on cost but also on resilience, effectiveness, and community outcomes. Complementing this, QRA used the Sustainable Asset Valuation initiative tool (SAVi) to quantify the long-term social and economic value of climate-resilient infrastructure investment[27]*.*

[24] HM Treasury (2025) 10 Year Infrastructure Strategy Working Paper
[25] Infrastructure New Zealand (2024) Position Paper: Climate Resilient Infrastructure
[26] Queensland Reconstruction Authority (2024) Queensland Reconstruction Authority
[27] QRA (2024) Resilience valuation | Queensland Reconstruction Authority

The QRA's approach has been recognised both nationally and internationally and serves as a reference point for other jurisdictions. It offers an example of centralisation of recovery and resilience efforts at the state level, providing greater coordination and certainty over co-funding levels between local councils and the central government.

Some countries, such as Singapore, have established a centralised body to oversee both adaptation and mitigation efforts. The National Climate Change Secretariat (NCCS), under the Prime Minister's Office, develops and implements domestic policies both in the mitigation and adaptation space, and works with sectoral agencies, like the Public Utilities Board, to mainstream resilience in a top-down approach. It also functions under the Inter-Ministerial Committee on Climate Change, which brings together key ministers to enhance whole-of-government coordination[28].

A whole-of-government approach is essential as adaptation challenges often lie outside the remit of one single agency. Similar to Singapore, cooperation among German ministries takes place in the Interministerial Working Group on Adaptation to Climate Change (IMAA), under the lead of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection. This ensures that the Climate Adaptation Strategy, which includes the infrastructure cluster, is aligned with other federal strategies, like the Water Strategy.[29]

While proactive coordination for infrastructure resilience can be well developed in theory, in practice, governance often operates reactively, particularly when unexpected disruptions occur. For example, after the 2024 record rainfall and floods in the UAE, its President ordered a study of infrastructure conditions. The Ministry of Energy and Infrastructure formed a task force that immediately started to review and assess the damage, and study the need to expand dams and waterways so they are ready for, and can contain, future extreme weather events.[30] Later that year, the UAE approved a major project to build and expand dams and water canals in 13 areas to enhance water storage and prevent flooding. Case evidence strongly favours proactive governance. As the ICE has previously noted, it is always cheaper to prepare than it is to rebuild.[31]

Multi-level structures for climate resilience: devolved, regional and local governance

Regional and local governments play an important role in developing climate-resilient infrastructure. In OECD countries, they are responsible for 69 per cent of climate-significant public investment. They plan, deliver, fund, and maintain the required climate-resilient infrastructure and set local framework conditions for climate resilience investment.[32] Regional governments act as intermediaries between national and local levels, often developing their own adaptation plans in line with national guidance.

In the UK, devolution grants Scotland, Wales and Northern Ireland autonomy to develop their own strategies, laws and coordination mechanisms to strengthen climate resilience. The devolved nations have tailored their national adaptation plans to address their specific climate-related challenges and priorities. Devolved governments can also be policy innovators: for example, adaptation planning in Wales is supported by Wales's pioneering well-being legislation. The Well-being of Future Generations (Wales) Act 2015 requires all public bodies to work towards seven long-term well-being goals, one of which is 'a resilient Wales'. It also creates the role of the Future Generations Commissioner to ensure that long-term thinking is embedded across governmental policies in support of sustainability.

[28] NCCS (2025) About NCCS
[29] BMUV (2024) German Climate Adaptation Strategy
[30] KhaleejTimes (2024) After President's Order, UAE Ministry Starts to Review, Assess Damages Caused by Extreme Weather
[31] ICE (2024) 5 Ways the UK Can Better Adapt to Climate Change
[32] OECD (2024) Infrastructure for a Climate Resilient Future

In Canada, provincial and territorial governments set the direction for climate change adaptation measures in their respective jurisdictions. Many have developed stand-alone climate change adaptation plans or strategies and have made investments to support adaptation decision-making and on-the-ground action. Canada's federal government engaged provincial and territorial leaders and Indigenous governments to develop a National Adaptation Strategy with shared targets and clear roles and responsibilities. Canada is also developing federal-provincial and federal-territorial action plans to ensure that climate adaptation efforts are tailored to local circumstances, varying climate risks, and the readiness levels in each province and territory.

Similarly, Australia's three levels of government – Commonwealth, State and Territory, and Local – have agreed and published their roles and responsibilities for climate adaptation.[33] These roles are underpinned by the principle that risks are most effectively managed by recognising and empowering those who are best placed to manage them. State and Territory Governments focus on developing effective regulatory and market frameworks, gathering accurate and regionally appropriate information, and delivering an adaptation response in areas of policy and regulation that are within the state's jurisdiction. This includes key areas of service delivery and infrastructure, such as emergency services, the natural environment, planning, and transport. Australian states craft their own resilience strategies and plans (e.g. Queensland's Climate Adaptation Strategy or Victoria's Adaptation Action Plans) and contribute to the development of the adaptation documents at national level, including the National Climate Resilience and Adaptation Strategy 2021–2025 and the upcoming first Australian National Adaptation Plan.

Ensuring coherence between the national and regional levels can be a challenge. Multi-level governance often benefits from committees, task forces or councils, where different levels of government can meet regularly.

For instance, Canada established adaptation governance tables comprised of federal-provincial-territorial (FPT) representatives. The primary mechanism for FPT cooperation is the Canadian Council of Ministers of the Environment, which is a minister-led intergovernmental forum for collective action on environmental issues of national concern. It aims to facilitate interjurisdictional cooperation on climate change mitigation and adaptation.

Similarly, Australia's National Climate Resilience and Adaptation Strategy created the National Adaptation Policy Office (NAPO) to coordinate work on climate adaptation 'across all governments' and serve as a central contact point on adaptation for businesses and communities.

Germany has its Standing Committee on Adaptation to the Consequences of Climate Change, which facilitates horizontal coordination by linking the federal government with the federal states (Länder), each developing its own regional adaptation strategies.

Multi-level structures for climate resilience: local implementation and community involvement

The local level is where the rubber meets the road on climate resilience. Many climate impacts are localised, so local governments are often the first to respond and plan for adaptation. They have insights into climate risk on the ground and engage with local communities. Local governments' roles typically include local planning and zoning, community engagement, infrastructure maintenance and emergency preparedness. However, these roles are often not clearly defined or are insufficiently supported by central governments.[34] To implement effective resilience measures, local governments must be empowered with resources and authority.[35]

[33] DAFF (2012) Roles and Responsibilities for Climate Change Adaptation in Australia
[34] Local Government Association (2024) Climate Action: International Learnings on the Governance of National and Local Government Collaboration
[35] London Climate Resilience Review (2024) The London Climate Resilience Review

National governments can mandate local adaptation measures. By requiring local governments to take adaptation actions, national authorities ensure that resilience-building becomes an intrinsic part of local decision-making.[36] For example, Denmark's central and local governments agreed in 2013 that municipalities must prepare climate plans. All Danish municipalities today have local climate plans through a nationwide initiative, the DK2020 Project.

Case study: Denmark – a global leader in local climate adaptation governance

Denmark is the first country in the world where every municipality has created a Local Climate Plan. This was made possible by the DK2020 Project, which started in 2019. It was led by the group Realdania and supported by C40 Cities. The project began with just 20 municipalities, but with help from Local Government Denmark and the five Danish regions, it grew to include all 98 municipalities across the country.

A strong support system was set up to help local areas plan for climate action. Municipalities worked closely with regional governments, while national organisations helped coordinate the project and shared easy-to-use technical advice. Local governments also involved the public by creating climate councils and holding workshops to hear from residents.

The Local Climate Plans include targets and actions on mitigation and adaptation, including flood-risk mapping, and set priorities for local adaptation measures. Project evaluations highlight the substantial impact of DK2020 on the adoption and quality of climate action plans, as well as on the capacity for climate action within Danish municipalities.[37] One of the learnings from the project is the importance of regional collaboration with other municipalities to ensure coordinated regional infrastructure.

Denmark is now furthering its climate commitment through the LIFE ACT project, aimed at monitoring and implementing climate action plans, assisting municipalities in translating plans into actions and capacity building.

In New Zealand, local governments have statutory responsibilities to avoid or mitigate natural hazards and to have regard to the effects of climate change when making certain decisions. Councils work with local communities to develop local strategies and long-term resilience pathways. However, the 2024 New Zealand Climate Adaptation Progress Report pointed out a major problem: the lack of a clear national framework for adaptation planning and implementation significantly impacts local governments by hindering their access to resources, their capacity and their willingness to act. This leads to delays, reactive decision-making and inconsistent approaches across regions, which ultimately results in inefficiencies, unsustainable precedents and inequities.[38]

There are growing calls to recognise that building resilience must be place-based, i.e. targeted or tailored to the circumstances of a particular location. A place-based approach can work with the grain of local markets and leverage the funding and powers of subnational governments.[39] The approach also means engaging local stakeholders and leveraging local knowledge.

Many countries emphasise empowering local communities in their National Adaptation Strategies. New Zealand, Australia and Canada acknowledge the role of Indigenous peoples in their strategies. These communities often face disproportionate climate impacts, but have long histories of living within, adapting to, and stewarding their environments. International practice shows that when local authorities, in partnership with Indigenous communities, assess climate risks and design locally relevant adaptation strategies, outcomes improve.

[36] OECD (2023) Climate Adaptation: Why Local Governments Cannot Do It Alone
[37] Concito (2024) DK2020: A Model for Multi-Level Cooperation
[38] CCC NZ (2025) Progress Report: National Adaptation Plan (August 2024)
[39] OECD (2025) A Place-Based Approach to Climate Action and Resilience

How can central governments support local resilience?

While local governments implement adaptation on the ground, central governments can empower them via collaborative forums, technical guidance and targeted funding programmes. This also promotes collaboration, as top-down strategies require local buy-in, while local innovations benefit from institutional support.[40]

In Ireland, the national government has set up four Climate Action Regional Offices (CAROs) to coordinate climate action at regional and local levels and help build on the existing experience across the local authority sector. Established in 2018 as Centres of Excellence based on distinct geographic and topographic characteristics, CAROs support the preparation and delivery of Local Authority Adaptation Strategies and ensure alignment between national policies and local strategies, making central mandates more actionable at the regional level.

In the UK, the Local Adaptation Advisory Panel (LAAP) was formed in 2011 by Defra to act as a forum for dialogue between local authorities, central government and arms-length delivery bodies. This group is an important pool of expertise which informs the National Adaptation Programme (NAP). However, it's noted that the lack of reporting and limited local resources hinder the LAAP's capacity to have more impact on policy decisions and its ability to implement adaptation practices.[41]

Governments can accelerate local resilience by creating dedicated adaptation programmes, with clear eligibility and matching funds for local projects. For instance, Queensland's QCoast2100 programme in Australia is a state-funded programme that is supporting coastal councils to build resilience. It provided over AUS $13.2 million in funding to coastal local governments to assess risks and plan adaptive measures and actions in consultation with the community.[42] The programme enabled local governments to improve their understanding of the vulnerabilities and risks to communities, infrastructure and the environment from current and future coastal hazard risks.

Climate resilience requires a whole-of-society approach where business, government, communities and academia all contribute to making infrastructure stronger against climate impacts. Such an approach, coupled with effective communication, education and stakeholder forums, can also build public support and ensure accountability.

As demonstrated by the examples in this section, effective governance for climate-resilient infrastructure requires vertical and horizontal coordination. Vertically, this involves collaboration between national, regional and local levels, while horizontally ensures coordination within the same levels of government, sectors and stakeholders to avoid siloes. Whole-of-government and whole-of-society approaches create a comprehensive framework, ensuring that all sectors work together to build resilience effectively.

What are the key policy frameworks for climate-resilient infrastructure?

National adaptation strategies and plans – foundations of infrastructure resilience

Climate resilience governance is supported by a range of policy frameworks, from adaptation strategies and plans to specific regulations. In many countries, the foundation for climate resilience is a national adaptation strategy or plan. This usually outlines priorities for adaptation across key sectors, including infrastructure. According to the UN, as of 2024, 171 countries (87 per cent) have at least one national adaptation planning instrument (policy, strategy, or plan) in place. Of these, 51 per cent have a second and 20 per cent have a third policy instrument. Some 16 of the 26

[40] CDRI (2021) Governance of Infrastructure for Resilience
[41] OECD (2024) Measuring Progress in Adapting to a Changing Climate
[42] Queensland Government (2025) QCoast2100 Program

countries without a national planning instrument are in the process of developing one.[43] Additionally, under the Paris Agreement, 64 countries have submitted their National Adaptation Plans to the UN.[44]

The UK was one of the first countries globally to legislate climate action with its Climate Change Act 2008, which requires the UK government to produce a national Climate Change Risk Assessment (CCRA) every five years, followed by a National Adaptation Programme (NAP) to respond to the identified risks. NAP progress has a significant level of oversight; it is subject to scrutiny by the CCC and Parliament. The CCC has a statutory duty to assess and report on the progress the government is making towards meeting the targets set out in the NAP.

The NAP3 for 2023–2028 was published in 2023 and set out priorities, including building resilient infrastructure.[45] While it introduced some positive measures, like the Climate Resilience Board and changes to the Adaptation Reporting Power (ARP), NAP3 drew criticism for lacking urgency. The ICE called it another missed opportunity in the UK's response to climate change[46] and the CCC confirmed that NAP3 has been ineffective in driving the critical shift towards effective delivery of adaptation.[47] The UK government has previously signalled it would strengthen climate resilience efforts, particularly following the High Court dismissal of a legal claim against NAP3; however, many voices agree that it isn't moving fast enough. The UK resilience framework also lacks a well-defined vision for what a resilient UK looks like, including targets and standards for the desired level of national, local or sectoral resilience.[48]

Some other countries have set their national strategies in a more actionable way. For example, Canada's National Adaptation Strategy (NAS), launched in 2023, emphasised setting clear metrics and long-term goals, as well as medium and near-term targets, across five priority areas: disaster resilience, health and well-being, nature and biodiversity, infrastructure, economy and workers.[49] One of the targets includes factoring resilience to climate change impacts into all new federal infrastructure programmes. The strategy contains a set of indicators for tracking progress in each area, including, for example, the percentage of public and municipal organisations that factored adaptation into decision-making processes for infrastructure. Canada's NAS emphasises a collaborative, whole-of-society approach, which seeks to leverage existing knowledge, experience and capabilities, and aims to ensure that adaptation benefits all segments of society. Implementation of the NAS is backed by an Adaptation Action Plan, which incorporates a total of 73 federal concrete actions across 22 departments and agencies, a funding commitment, and a responsibility to report annually on progress towards its targets.[50] By introducing measurable targets, Canada's plan offers an example of how to build in accountability for adaptation.

New Zealand's National Adaptation Plan, developed in August 2022, warns that poor governance and unfit institutional arrangements could lead to maladaptation and worsen the climate change impact. To address those risks, the plan identifies four priorities: enabling better decisions, targeting the right places, laying the foundations for a range of adaptation options, and embedding climate resilience across government policy. These rightly focus on putting in place the frameworks for better decisions and long-term thinking at all levels of government.[51]

[43] UNEP (2024) Adaptation Gap Report 2024
[44] UNFCCC (2025) National Adaptation Plans: Building Resilience in a Changing Climate
[45] HM Government (2023) National Adaptation Programme (NAP3)
[46] ICE (2024) 5 Ways the UK Can Better Adapt to Climate Change
[47] CCC (2025) Progress in Adapting to Climate Change: 2025 Report to Parliament
[48] Committee of Public Accounts (2024) Government Resilience: Extreme Weather
[49] Government of Canada (2023) National Adaptation Strategy for Canada
[50] Government of Canada (2024) Government of Canada Adaptation Action Plan
[51] ICE (2022) How New Zealand is Paving the Way to a Climate Resilient Future

Long-term planning is essential for climate-resilient infrastructure

In addition to the Adaptation Plan, New Zealand is working on an adaptation framework to strengthen how the country prepares for the effects of climate change. It seeks to establish an enduring, long-term approach to adaptation, setting out the government's approach to sharing the costs of adapting to climate change and answering the question of who pays for adaptation. If developed effectively, it will help communities and businesses know what investment will happen in their area: for example, whether the council will build flood protection infrastructure, and what support will be available to help with recovery from events like landslides or floods. The framework will cover proactive choices to protect from foreseeable risks, and long-term recovery after a severe weather event happens.[52]

A long-term planning horizon is necessary, given the decades-long lifespan of infrastructure. The ICE-convened Enabling Better Infrastructure (EBI) programme[53] has long emphasised the importance of long-term thinking in infrastructure strategic planning, which should go beyond short-term political and economic cycles and focus on creating systems that are resilient, sustainable, and adaptable to future needs and uncertainties.

For example, Canada in its National Adaptation Strategy looks ahead as far as 2050, setting a national goal that by 2050 all infrastructure systems will be climate resilient and undergo continuous adaptation to adjust to future impacts to deliver reliable services to all.

The Delta Programme in the Netherlands focuses on the period up to 2050, with a forward view to 2100. While some measures are designed to last for the next 50 to 100 years, the programme highlights flexibility to incorporate new solutions.

Scenario planning using long-term climate projections enables decision-makers to design future-proof assets and reduces the risk of stranded assets. For example, the UK's Environment Agency and Singapore's Building and Construction Authority incorporate 2100 sea-level rise projections into coastal infrastructure design. In contrast, many countries still lack explicit forward-looking projections, often due to climate data availability issues.

Resilience standards – essential thresholds for infrastructure climate resilience

Clear, measurable resilience standards are crucial for effectively translating climate policy into actionable practices. These standards establish specific performance thresholds that infrastructure must meet to withstand future climate conditions. For example, standards may dictate the required strength of flood defences, the capacity of drainage systems to handle increased rainfall, or thermal performance of buildings in response to rising temperatures.

The Netherlands has become the world's first country to establish a national risk-based flood standard. This standard assesses both the likelihood of a flood and its potential impact. The probability of failure for flood defences varies from 1/300 per year to 1/100,000 per year, depending on population density, the presence of critical infrastructure, and the potential for damage from a flood. For example, a levee section in a rural area might be designed to have a 1/300 annual probability of failure, while a levee section protecting a major city centre might have a much lower probability of failure, such as 1/100,000. This approach ensures that areas with higher consequences of failure or critical infrastructure receive more stringent protection.

In the UK, the National Infrastructure Commission (NIC – now merged into a new body, NISTA), in its second National Infrastructure Assessment (NIA2), highlighted that infrastructure and the environment are interdependent and called for the setting of national standards for how infrastructure services should operate in the face of challenges.

[52] Ministry for Environment, New Zealand (2025) Adaptation Framework
[53] EBI (2025) Enabling Better Infrastructure

The NIC urged the UK government to publish an initial set of resilience standards by 2025, so that around £400 billion of investment decisions due in the next five years could factor in these targets.[54] These standards would cover customer outcome, system performance, and system recovery.

Integrating adaptation into infrastructure decision-making

Building climate-resilient infrastructure involves integrating climate adaptation into every stage of project development, including procurement, planning, design and asset management.

For example, New Zealand's National Adaptation Plan directs agencies to ensure new infrastructure is fit for future climate conditions. The UK has incorporated adaptation through sector regulators and large public asset managers. Network Rail, which manages the UK's rail infrastructure, requires rail providers to factor in climate change in adaptation strategies. It has developed Weather Resilience and Climate Change Adaptation Plans for each region, outlining how they are identifying risks to assets and developing strategies to address them. The UK's water and energy regulators, Ofwat and Ofgem, also require regulated utilities companies to factor long-term climate risk into their asset management and business plans.

Monitoring and evaluation are essential to track progress and ensure that adaptation activities are implemented effectively. In the UK, one important tool for encouraging public sector adaptation is the Adaptation Reporting Power (ARP) under the Climate Change Act 2008. It allows the UK government to request reports from infrastructure providers and bodies with functions 'of a public nature' on how they manage climate risk. The fourth round of climate change ARP, launched in 2024, has extended the requirement to a broader set of organisations, including local authorities. This process helps the government track progress and raise awareness, build capacity and make examples of good practice publicly available. The ICE has previously recommended making the reporting for infrastructure operators mandatory to ensure that all critical infrastructure sectors regularly assess and report on their climate risks and measures to address them.[55]

Similarly, in the European Union, the Corporate Sustainability Reporting Directive (CSRD) and the EU Taxonomy Regulation require large companies, including infrastructure operators, to disclose climate-related risks and their adaptation measures as part of their sustainability reporting.

Updating engineering standards and building codes is another tool to encourage climate-resilient infrastructure. The ICE is now working on new publicly available specification (PAS) standards for adaptation that will specify how to develop and apply adaptation pathways in the infrastructure sector. The PAS will set out governance requirements, including responsibilities and key metrics, and will guide on choosing appropriate climate change scenarios.[56]

Nature-based solutions are also gaining traction as they offer effective natural defences against climate risks and mitigate climate change impacts.[57] They can be used as a substitute or complement to grey infrastructure, and provide a wide range of co-benefits for biodiversity, human well-being and communities.[58] For example, Singapore is widely recognised as a leader in nature-based solutions. Through initiatives like the 'City in Nature' and the Active, Beautiful, Clean Waters Programme (ABC Waters), Singapore has integrated natural elements into urban planning and flood management.

[54] NIC (2024) NIC Resilience Standards Report
[55] ICE (2023) ICE Policy Position Statement: How Can the UK's Infrastructure System Be Made More Climate Resilient?
[56] ICE (2025) ICE Starts Work on Climate Adaptation and Infrastructure Productivity PAS
[57] ICE (2024) How Policy Can Unlock The Potential Of Nature-Based Solutions
[58] OECD (2025) Nature-Based Solutions and Climate-Resilient Infrastructure

Effective policies establish an enabling environment for adaptation investments. Through committing to long-term infrastructure resilience strategies with well-defined targets and projects, governments enable investors to plan effectively, whereas a lack of clear policies or a stop-start approach can create uncertainty and deter investment.

What are the funding approaches for climate-resilient infrastructure?

One of the key aspects of climate resilience is funding. Economies globally face a significant strain on their public budgets, having to make difficult choices amid competing needs. Adaptation projects often lack immediate revenue streams, and their benefits are not easily quantified or traded in markets. When adaptation works well, it can also go unnoticed because it prevents problems rather than responding to them. Politically, it is harder to justify spending on something that doesn't have an immediate and tangible result. As a result, adaptation can remain underfunded or overlooked.

Both public and private sector actors play a role in mobilising resources. Public budgets cover most resilience investment for infrastructure, but they alone cannot fill the gap. The London Stock Exchange Group (LSEG) highlights that increasing spending on adaptation and resilience is emerging as a new growth vector for the green economy. Some 34 per cent of listed companies on the FTSE All World Index already mention adaptation in their disclosures, with that figure rising to over 70 per cent for real estate and utility companies. LSEG analysis of over 12,000 green bonds reveals that 25 per cent are linked to adaptation and resilience investments. The LSEG has identified over 2,100 companies that generated a total of over US$1 trillion in revenues from products and services that contribute to climate adaptation, accounting for roughly one-fifth of the global green economy in 2024.[59]

Earmarking funds for climate-resilient infrastructure

A few countries launched dedicated adaptation funds for climate resilience. For example, Australia established a Disaster Ready Fund (in place of the previous Emergency Response Fund) to support communities across the country to prepare for disasters. The fund provides up to AUD $200 million per year across Australia to invest in mitigation infrastructure projects such as flood levees and fire breaks, as well as systemic disaster risk reduction projects such as hazard mapping, land use planning and governance projects, and projects that incentivise private investment.[60] Round One funded 185 disaster risk reduction projects across Australia in 2023–2024; several projects have been delivered in partnership with First Nations communities.

Similarly, the Government of Canada established the Disaster Mitigation and Adaptation Fund (DMAF), committing CAD $2 billion over 10 years to invest in structural and natural infrastructure projects that enhance the resilience of communities impacted by natural disasters triggered by climate change. In 2021, an additional CAD $1.375 billion in federal funding over 12 years was provided to renew the DMAF. Of this, a minimum of CAD $138 million is specifically allocated to indigenous recipients.[61]

Public infrastructure-focused banks, such as the Canada Infrastructure Bank, can also draw private sector investment into climate-resilient infrastructure through equity, loans and guarantees. The UK's Infrastructure Bank was recently replaced with a National Wealth Fund with a £27.8 billion capital base, which can play a significant role in driving investment in resilient and sustainable infrastructure in the country.

However, some argue that relying solely on separate adaptation funds can be less effective than embedding resilience considerations into broader public investment planning and budgeting processes. In practice, this would

[59] LSEG (2025) LSEG Green Economy Report 2025 – Investing in the Green Economy 2025

[60] Australian Government, National Emergency Management Agency (2022) Disaster Ready Fund to Deliver Long-Term Resilience

[61] Housing, Infrastructure and Communities Canada (2025) Disaster Mitigation and Adaptation Fund: Overview

require reforms to public investment management systems, as public sector investment rules often demand short payback, which can undervalue the long-term benefits of climate adaptation. To enable more investment in resilient infrastructure, appraisal and budgeting rules need to be updated to reward avoided future losses.

For example, in the UK, HM Treasury's Green Book guidance on the appraisal of public investments was updated to support analysts and policymakers to ensure that policies, programmes, and projects are resilient to the effects of climate change, and that such effects are being considered when appraising options.

The government of Canada requires federal infrastructure investments to undergo climate resilience assessments via its Climate Lens tool. This tool mandates assessments from both a greenhouse gas mitigation and resilience perspective. It also encourages applicants to consider how this benefits communities and creates jobs.

A recently published report by the University of Oxford and the UN Environment Programme (UNEP) provides new evidence on the fiscal case for adaptation. It outlines how governments can maximise the efficiency of public expenditure by focusing on areas such as integrating adaptation into fiscal risk management and financing strategies, and aligning public spending with climate resilience goals.[62]

Exploring innovative mechanisms

Public-private partnerships (PPPs), if structured correctly, can improve infrastructure climate resilience, offering innovative solutions to address both mitigation and adaptation challenges. PPPs can leverage private sector expertise, investment, and innovative technologies to build and maintain infrastructure that is more robust and adaptable. The World Bank has developed Climate Toolkits for Infrastructure Public-Private Partnerships to guide governments and the private sector on incorporating climate considerations into PPP projects, ensuring both climate mitigation and adaptation measures are integrated.[63]

There is also growth in capital market instruments like green bonds earmarked for adaptation. For example, the Singapore Government aims to issue up to SGD $35 billion of green bonds by 2030 to fund public sector green infrastructure projects.[64] Singapore's national water agency, PUB, has launched a green bond to finance the Tuas Nexus, a resilient integrated water and waste treatment facility built to withstand extreme weather.[65] Subnational governments increasingly use these instruments to finance infrastructure projects that enhance climate resilience.

Miami Forever Bond – a pioneering example of financing infrastructure climate resilience through local innovation

In late 2017, Miami residents approved the US$400-million Miami Forever Bond to fund implementation of five major categories of infrastructure improvements to enhance the city's defences against climate change, particularly sea-level rise and increased flooding. Through this programme, the city has been able to fund numerous adaptation projects, including pump stations, raised roadways and improved stormwater management.

The Bond programme is being executed in three phases: immediate impact, gain momentum and long-term solutions. The Citizens Oversight Board has been formed to oversee project management and progress reporting, complementing the standard oversight provided by the City Commission, to ensure transparency and accountability.

[62] University of Oxford and UNEP (2025) Enabling Adaptation
[63] World Bank (2025) Climate Change Toolkits
[64] Ministry of Finance, Singapore (2025) Singapore Green Bond Framework
[65] PUB (2024) Green Bond Report

The Forever Bond structure utilises a municipal revenue bond to finance climate-related infrastructure projects. It spreads the cost over several decades, aligning payments with the long-term benefits – such as flood protection and sea-level rise adaptation. This approach helps manage costs over time, while matching the lasting value of the investments.[66]

To bridge the adaptation finance gap, subnational governments can also explore environmental taxation (including carbon taxes), land capture value instruments, taxation earmarked to fund green investment, environmental user charges and fees, and earmarked capital grants.[67]

Challenges and opportunities

Despite growing awareness and effort, significant challenges persist in governing climate resilience. Many of these challenges also bring opportunities. This section identifies key barriers and discusses how they can be overcome.

- Lack of clarity around roles and responsibilities. Adaptation efforts involve many actors at different levels, but mandates can be undefined or overlapping. Often, no single entity is fully in charge of adaptation, and there is no clear accountability. Without clear mandates and coordination, adaptation falls through the cracks. Defining and communicating clear roles and responsibilities for each stakeholder at all levels would help create a clear framework to ensure transparency and faster action. The creation of a central authority could unify adaptation planning, ensure policy consistency, and enhance coordination.

- There are siloes between and within different levels of governance. Climate resilience planning is often disjointed, and there can be misalignment between national, regional and local strategies. Different agencies working in siloes could lead to infrastructure risks being overlooked. Effective governance for climate-resilient infrastructure requires not only vertical coordination between different levels of government but also horizontal – between the same levels, regions and a breadth of stakeholders, including local communities. To approach this, governments can establish forums for engagement, as well as move to network governance, where government, civil society and the private sector coordinate as partners in building resilience. Vulnerable communities are often hit hardest by disruptions and need to engage in decisions on infrastructure climate resilience.

- Short political and planning horizons are an obstacle. Adaptation measures are long term in nature and may only show benefits over decades. Politicians tend to favour projects with quick payoffs and visibility, and climate change can still be seen as not an urgent threat. Adaptation benefits can also go unnoticed, being victims of their own success. Setting long-term targets on adaptation and reporting on them regularly, as in the examples of Canada's National Adaptation Strategy and the Netherlands' Delta Programme, can ensure accountability and continuity beyond electoral cycles. Long-term budgeting and study of the cost-effectiveness of resilience can also offer a solution.

- Weak plans and non-actionable policies stall progress. National adaptation plans and regulations can be vague and piecemeal, lacking measurable targets and secured funding, so they remain statements rather than encouraging action. Embedding clear and measurable adaptation goals and concrete targets linked to committed budgets can help translate policy into action, while ensuring robust monitoring and evaluation. This would help hold agencies accountable and measure success.

[66] Tony Blair Institute for Global Change (2025) Protecting the Future: An Agenda for Building Climate-Resilient Economies
[67] OECD (2025) A Place-Based Approach to Climate Action and Resilience

- Governments approach adaptation reactively. Policies and actions are often taken in response to climate impacts rather than in anticipation of risks. Reactive approaches lock in vulnerability and raise future costs. Proactive adaptation would involve forward-looking planning, embedding climate risks into policies, and investing in retrofitting and maintaining current infrastructure. As the Queensland Reconstruction Authority example shows, investing in resilient infrastructure upfront results in savings by avoiding reconstruction costs.

- Governments lack systems thinking. Infrastructure needs to be considered as a system of systems. Different infrastructure sectors are highly interdependent. Extreme weather events can create cascading risks that spread across sectors. Changes to governance and decision-making structures are needed, which will support systems thinking in the planning, delivery, operation, and recovery of infrastructure systems. Moreover, data-driven technologies provide a huge opportunity. Digital twin technologies can highlight how infrastructure assets work together in a system to become more resilient.

- Capacity is a constraint, especially at the local level. The capacity gap can lead to inaction. Local governments more often lack technical expertise, a skilled workforce and data to plan local resilient infrastructure and implement adaptation on their own. This challenge can be addressed by providing resources, and encouraging knowledge transfer. Establishing platforms for capacity-building will help to ensure that local institutions can tailor climate-resilient infrastructure solutions to local needs and maintain them over time.

- The funding gap for adaptation is too large. It's hard to capture the return on adaptation investments in a traditional financial sense. Governments often lack budgets for resilience, while private investors hesitate without clear and consistent signals from governments. While significant sums are being spent on infrastructure, not enough is explicitly directed to adaptation. Traditional cost-benefit analysis tools may undervalue avoided damages in the future. To overcome this challenge, governments can explore mainstreaming resilience into all infrastructure funding, using innovative finance tools and strengthening disclosure regimes.

Recommendations

Building on the previous sections, below is a set of recommendations to accelerate the shift towards a proactive, coordinated and well-financed approach to climate-resilient infrastructure. The essential lesson is that adaptation accelerates when responsibility, authority, and resources move in unison.

1. Establish clear roles and leadership for infrastructure climate resilience. This means defining who is responsible for driving and monitoring adaptation progress and outlining clear roles and responsibilities to avoid fragmentation. Governments can also designate a clear lead entity for infrastructure resilience, empowered to coordinate across ministries and levels of government.

   In the UK: The CCC has warned that the current government's climate adaptation efforts are inadequate. Responsibility for climate resilience and adaptation needs to extend beyond Defra and across the whole government. The London Climate Resilience Review, the National Preparedness Commission and the National Trust are among other organisations that have made similar recommendations.

2. Commit to ambitious national adaptation plans and strategies with clear targets. Governments should ensure that national adaptation strategies and plans set clear resilience goals and measurable targets for infrastructure and services, linking them to budget and planning cycles.

In the UK: NAP3 largely restates announcements already made elsewhere. The lack of new plans and investment has raised questions that the government should act urgently to address. The CCC finds that most adaptation outcomes are still rated 'limited' or 'insufficient'. The government needs to provide objectives and targets that are clear, measurable, and actionable.

3. Strengthen multi-level governance and local capacity. Coordination mechanisms between and within national, regional and local authorities need to be enhanced. Governments can create or strengthen regional and local coordination platforms, formalise vertical coordination through regular intergovernmental forums to reduce fragmentation, and ensure two-way information flow so that local knowledge informs national policies and vice versa. Governments also must empower local authorities through dedicated funding and powers to be proactive. Central governments can provide guidelines, capacity-building, and knowledge exchange to help local governments conduct climate risk assessments and develop adaptation plans.

   In the UK: The UK government needs to ensure greater coordination between and within different levels of government via dedicated platforms and investment in local capacity. The government must consider requiring local authorities to adapt to climate change, allocating funding in local budgets to support this duty. The London Climate Resilience Review makes several relevant recommendations in its chapter Enabling London to Lead.

4. Promote an inclusive and community-based approach to infrastructure resilience. Communities, especially vulnerable groups, must be brought into the conversation around resilience. ICE previous research found that the UK public doesn't recognise a strong link between infrastructure investment and climate resilience.[68] A whole-of-society approach and transparent information can build public support for new projects and resilience spending.

   In the UK: The Adaptation Reporting Power has been extended to include local governments. As part of this, local councils should be required to report on how they involve communities – indeed, many are calling for this. The government should also strengthen frameworks to integrate local knowledge into infrastructure adaptation.

5. Embed climate resilience into all infrastructure planning. Governments should consider baking climate risk considerations into core planning processes, from national infrastructure strategies to land use plans. For existing assets, there must be programmes to systematically retrofit and upgrade them. Governments should update standards, codes, and project appraisal frameworks to require that new infrastructure is designed to withstand current and future climate risks.

   In the UK: The upcoming 10-year infrastructure strategy must set out how the government will integrate climate adaptation into the delivery of infrastructure. While this strategy is a positive step, 10 years may not be long enough to address the increasingly severe impacts of climate change over the longer term. The new National Infrastructure and Service Transformation Authority (NISTA), as recommended in a recent report by Public First[69], should be tasked with monitoring climate resilience, including flood risks, across all government infrastructure spending. Due to fragmented responsibilities, the government lacks a clear picture of climate risk spending. NISTA could fill this gap by tracking expenditures and outcomes, helping to shape future resilience standards.

[68] ICE (2025) Briefing Paper: Paying for Britain's infrastructure system
[69] Public First (2025) From Risk to Resilience: The Case for Flood-Resilient Communities, Economy and Growth

6. Unlock funding for resilience. Governments should align public budgets and funding streams with resilience objectives. Governments can provide dedicated adaptation funds or include resilience components within existing programmes, also engaging private sector through incentives and regulation.

   In the UK: The Spending Review must support climate adaptation planning with enough resources across government. Proactive adaptation is an investment in the country's resilience, rather than an added cost.

7. Finance rules must be reformed to value long-term benefits. Traditional cost-benefit analysis undervalues resilience. Appraisal methods should be reformed to account for long-term benefits and avoided damages.

   In the UK: The UK government should undertake a national review of the economics of adaptation to ensure decisions reflect full benefits.

8. Mandate resilience in regulation and disclosure. Governments should consider making climate risk disclosure and resilience standards mandatory across infrastructure sectors.

   In the UK: The UK already has the Adaptation Reporting Power (ARP), which invites local governments and many infrastructure operators to report on climate risks and actions. The government should make the ARP mandatory for local governments and infrastructure operators. This would provide better, more detailed information for the government and infrastructure owners to make and enact further plans. The UK should also adopt clear outcome-based resilience standards for infrastructure, as called for by the NIC and others.

About the ICE

The Institution of Civil Engineers (ICE) is a 97,000-strong global membership organisation with over 200 years of history.

It is a centre of engineering excellence, qualifying engineers and helping them maintain lifelong competence, assuring society that the infrastructure they create is safe, dependable and well designed.

Its network of experts offers trusted, impartial advice to politicians and decision-makers on how to build and adapt infrastructure to create a more sustainable world.

This project supports the ICE's objectives by setting out insights and views on how governments globally are adapting and increasing resilience of their infrastructure to the effects of climate change. For more information, please contact: Ekaterina Atkins, External Affairs Programme Manager: policy@ice.org.uk.