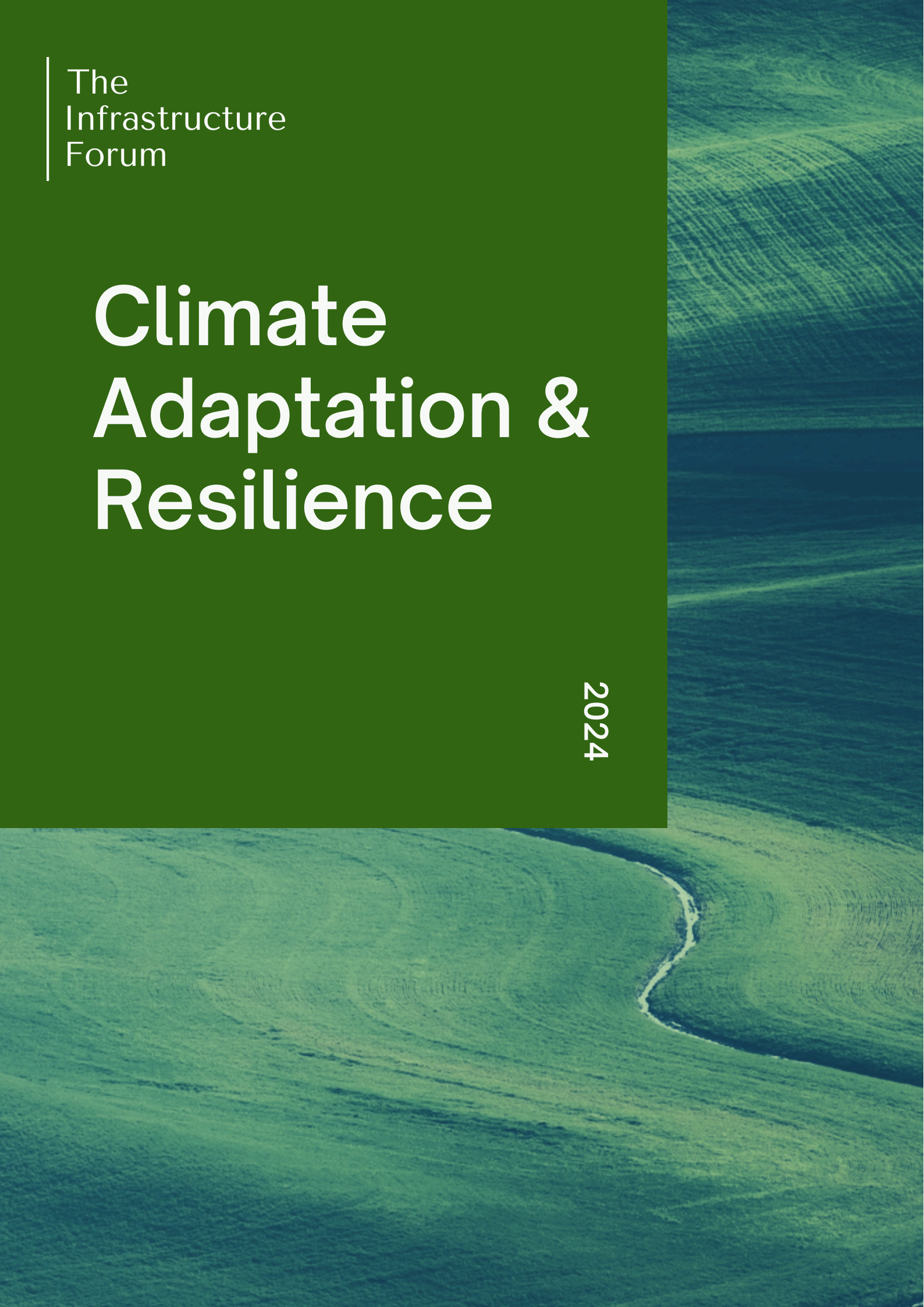
The Infrastructure Forum

Climate Adaptation & Resilience

2024



Foreword

From Richard Threlfall, Global Head of Infrastructure, Government and Healthcare at KPMG, and TIF Member

With 2023 setting an unwelcome record for global heating, the world is 1.48oC hotter than pre-industrial times, and teetering on the edge of runaway climate change. The UK's infrastructure is exposed to increased intense and frequent heatwaves, more intense rainfall, flash flooding and sea level rise.[1] As well as extreme events, society is experiencing the cumulative impact of delays and service deterioration driven in part by unpredictable weather and average temperature increase. And yet we are underprepared,[2] with adaptation and resilience planning and action fragmented and underfunded, leaving the UK vulnerable to the economic, social, and environmental consequences of a changing climate. Though leaders in our industry are increasingly aware of the challenges, the public are not yet fully cognizant of the challenges ahead, and climate resilience is apparently not a top political priority, receiving little coverage in this year's election debates. This lack of public awareness is a significant concern, and communications need to strike the right balance between the continuing need for net zero to minimise impacts and facing the reality of impacts that are already manifest or committed. Only through a concentrated effort to raise awareness and build public support can we hope to achieve the necessary level of investment in adaptation and resilience measures.

Key challenges:

- Investment and funding: tight budgets, short-term focus, and bureaucratic processes hinder investment in adaptation and resilience measures, as the CCC acknowledged in its review of the National Adaptation Programme.
- Data and decision-making: lack of clarity on desired social outcomes, data limitations, and unclear responsibilities for decision- making impede effective adaptation strategies.
- Policy and regulation: short-term political cycles, lack of clear guidance on climate scenarios and adaptation goals, and inconsistent regulatory standards create uncertainty and hinder progress.

We are clear that investing in adaptation and resilience measures will not only protect the UK's infrastructure from the impacts of climate change but also provide a range of benefits, including:

- Improved public health and safety
- Reduced economic losses
- Enhanced social equity and justice
- Increased attractiveness and affordability of infrastructure
- Protection and enhancement of nature
- Creation of new jobs and opportunities

As the voice of UK infrastructure, the Infrastructure Forum is clear that we need to move further and faster as a sector to meet the challenges of climate change, through our own decarbonisation and resilience efforts and as an enabler of a resilient and sustainable climate transition. In this paper we have identified the key policy, investment and strategic challenges impeding progress, and provided recommendations for how to drive change at the scale and pace required to adapt to the changing climate.

Recommendations:

- Clear steer from government: establish a comprehensive vision, strategy, and implementation plan for climate resilience and adaptation, including clear goals, milestones, and responsibilities, as called for in the open letter from 400+ academics to party leaders
- Impactful analytical approach: develop sector-specific performance metrics, define adaptation targets, and focus on the economics (costs and benefits) of adaptation to build a strong business case for investment.
- Mobilise action and private sector expertise: develop plans for industry action and investment, explore innovative financing models, and establish a public-private working group to align policy and regulation.

The UK has the opportunity to take decisive action to address the challenges of climate adaptation and resilience in the infrastructure sector. By implementing the recommendations outlined in this paper, the UK can build a more resilient and sustainable infrastructure system that can withstand the impacts of a changing climate and ensure a prosperous future for generations to come.

Richard Threlfall
July 2024

1. Independent Assessment of UK Climate Risk - Climate Change Committee (theccc.org.uk)
2. London Climate Resilience Review press release Jan 2024 (london.gov.uk)

Context

The reality of climate change is no longer a distant threat but a present reality, with global temperatures in 2023 already 1.48°C above pre-industrial levels. While decarbonisation efforts remain crucial, the need for adaptation and building resilience to climate impacts has become increasingly urgent.

The UK Government, a pioneer in climate change legislation with the 2008 Climate Change Act, has established a framework for adaptation planning and reporting. And the UK has world-leading climate analysis capability with the Met Office and universities, which are a source of insights and innovations to improve resilience. The Met Office plays a crucial role in providing climate data and projections, which are essential for informing adaptation strategies. The UK National Climate Science Partnership (NCSP) is another key initiative that brings together expertise from across the climate science community to address the challenges of climate change.

Defining Adaptation & Resilience[3]

Resilience

The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

Adaptation

In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

However, despite this foundation, funding and focus on adaptation have waned, leaving the UK vulnerable to the growing risks of climate change. The current National Adaptation Programme (NAP3)[4] has fallen short of expectations, lacking robust economic analysis, specific additional actions, and measurable targets. While the UK has a well-established risk assessment methodology, it lacks detailed economic analysis and local-level assessments, hindering effective adaptation strategies.

Despite these shortcomings, there are encouraging signs of growing attention from government departments, agencies, and the private sector. The Department for Transport's consultation on an adaptation strategy for transport and Network Rail's planned £2.8bn investment in resilience are positive steps. However, the UK Government's silence on the implications of current global climate trends and increasing ambition for adaptation raises concerns. The lack of a strong economic case

3. IPPC Sixth Assessment Report, Annexes (ipcc.ch) (2003)
4. Third National Adaptation Programme (NAP3) - GOV.UK (www.gov.uk)

or adaptation, coupled with political reluctance to address the issue, has hampered progress.

Recent events, including the extreme winter floods and storms of 2023, highlight the urgency of building resilience. The potential for further, and potentially more severe catastrophic weather events in the near future underscores the need for immediate action.

By leveraging the expertise and resources of the Met Office, universities, and other organisations, the UK is well-positioned to develop and implement innovative solutions for adapting to climate change. These solutions offer the potential to contribute to solutions that protect our communities, infrastructure, and economy from the impacts of a changing climate. However, a renewed commitment to adaptation, backed by robust economic analysis and clear targets, is essential to ensure the UK's long-term resilience in the face of a changing climate.

This position paper aims to address the critical need for climate adaptation in the UK. It will identify key challenges and provide recommendations to the government for strengthening its approach to adaptation, ensuring a more resilient future for the nation.

Adaptation and Resilience Challenges Facing UK Infrastructure

The UK infrastructure sector faces numerous and often interdependent challenges in accelerating climate resilience and adaptation. Because of this interdependency, these challenges can be broadly categorised into three main areas: investment and funding, data and decision-making, and policy and regulation.

Investment and Funding

In its Independent Assessment of the NAP3[5], the Climate Change Committee emphasised the importance of public funding and attracting private finance into adaptation, both of which will be required for an effective adaptation response.

UK infrastructure is ageing and in need of significant upgrades. Where policy and regulation prioritises short-term cost control, this can drive a prioritisation of immediate engineering needs. This leaves longer-term environmental and social considerations, including adaptation and resilience measures, on the back burner, even if such investments make financial sense in the longer term.

Furthermore, maintenance budgets are often the first to be sacrificed when finances are constrained, leaving our infrastructure even more vulnerable to the elements. Securing funding for upgrades is a significant bureaucratic challenge, with complex requirements and lengthy processes discouraging collaborative public and private investment and slowing down progress. It is a cycle that leaves our infrastructure, and society, exposed to the consequences of a changing climate.

Data and Decision Making

The current focus on the negative impacts of climate change often overshadows the potential benefits of adaptation and resilience measures, such as their contribution to making places attractive and liveable. This can lead to a skewed assessment of costs and benefits, hindering informed decision-making.

Further complicating matters is the lack of clarity on desired social outcomes and the balance between different priorities. Without a clear vision of what we want to achieve,

5. Independent Assessment of the Third National Adaptation Programme - Climate Change Committee (theccc.org.uk)

it is difficult to allocate resources effectively and guide decision-making. This lack of direction creates a sense of uncertainty, making it challenging to navigate the complex landscape of adaptation and resilience.

This challenge is compounded by the inherent uncertainty in climate science projections. This uncertainty makes it difficult to accurately assess the vulnerability and exposure of infrastructure to climate change and the costs of adaptation. However, it is important to recognise that not all of this uncertainty can be eliminated. Therefore, we need to develop arrangements that navigate this uncertainty to enable decision making and investment.

The infrastructure sector lacks the tools and data to make decisions about adaptation and resilience, and flow these through into investment plans. While infrastructure owners and operators are responsible for the resilience of their assets, government policy and regulation does not currently provide a clear steer on the assumptions to make about future climate change and expected resilience standards, as the National Infrastructure Commission has highlighted.[6] This can lead to delays, inaction, and a fragmented (and consequently more costly) approach, hindering progress and leaving us vulnerable to the impacts of climate change.

Finally, the lack of appropriate resilience and adaptation metrics makes it challenging for the infrastructure sector to set goals and measure progress. Without clear benchmarks, it is difficult to assess the effectiveness of adaptation and resilience efforts and make necessary adjustments along the way. This lack of clarity can create a sense of aimlessness, making it difficult to stay motivated and focused on the long-term goal of building cost-effective, resilient infrastructure.

The data and decision-making challenges are intertwined with the investment and funding challenges, creating a complex web of interconnected issues. Addressing these challenges requires a holistic approach that considers the physical, financial, and social aspects of infrastructure resilience. By tackling these challenges head-on, we can build a future-proof infrastructure that can withstand the test of climate change.

Policy and Regulation

Government plays a crucial role in providing the necessary support and direction. Clear guidance on climate change scenarios, metrics, resilience standards and adaptation goals is essential for long-term planning and investment. This will ensure that we are not merely reacting to the challenges but proactively shaping a resilient future. However, the short-term political cycle can pose a challenge to long-term planning efforts. The constant shift in political priorities can make it difficult to maintain a consistent focus on adaptation and resilience needs. This can lead to fragmented and

6. Regulation & Resilience - NIC

reactive approaches, where short-term fixes take precedence over long-term solutions.

To overcome this challenge, regulators need to step up and provide clear guidance on the standards and requirements for adaptation and resilience. We recommend a collaborative approach between government, regulators, and industry for the development of standards and requirements. This would provide consistency and accountability across different projects and initiatives, creating a solid foundation for building resilient infrastructure.

While clear guidance on climate adaptation is essential, identifying and addressing regulatory barriers is equally crucial to avoid hindering implementation. From a planning and consenting perspective, the UK's highly regulated environment, while beneficial for the environment and communities, faces challenges due to increased legal challenges and environmental requirements. Local authorities, government agencies, and courts often respond slowly, lacking responsibility for efficient decision making. On the other hand, economic regulators face the challenge of balancing investments against cost control. For instance, utility price control reviews must weigh well-justified investments in resilience against keeping customer bills low. This balancing act requires careful consideration of long-term value for both existing and future consumers, ensuring sustainable and resilient infrastructure development.

Recommendations to Government

A clear steer from government is an essential precondition for enhancing the resilience of the UK's infrastructure in the face of climate change. UK infrastructure needs a comprehensive vision, strategy, and implementation plan that provides all stakeholders with a clear understanding of the direction and their roles in achieving it.

Recommendations for a Clear Steer on Climate Resilience and Adaptation in UK Infrastructure

A. Setting an ambitious, achievable, and measurable vision and strategy:

Government and regulators should set clear goals and expectations for adaptation and resilience. This includes establishing clear timeframes and responsibilities, assigning roles and deadlines for implementing specific measures. As the Climate Change Committee has observed,[7] the current National Adaptation Programme, NAP3, lacks a clear strategy with defined objectives, milestones, and key performance indicators. To address this, the government should set a clear definition of a climate-resilient and well-adapted UK, including timescales, milestones, and short-term priorities. Guiding the development and implementation of adaptation and resilience strategies is crucial for ensuring consistency and effectiveness. This can be achieved through the development of clear principles that all stakeholders can adhere to. This will provide a tangible target for all stakeholders to work towards. Ireland's National Adaptation Framework[8] (NAF) could serve as an example of a framework that guides government spending and regulatory settlements. The UK's NAP does not currently align with spending decision timescales dictated by spending reviews and sector regulatory cycles. A NAF could address this shortcoming by providing a clear statement of what should be included in spending reviews and regulatory decisions relating to business plans. It serves as a static set of rules that feed into both national adaptation planning and other decision-making processes. This would help to ensure that climate resilience is not treated as a separate issue but is integrated into all aspects of government policy and spending. Taking this approach in the UK could provide an agreed framework for steering regulation and investment towards climate resilience goals.

B. Implementing a climate resilience duty for regulatory/industry oversight bodies:

Currently, the only infrastructure regulator with resilience duty is Ofwat. In line with the NIC's recommendations,[9] we see merit in reviewing the implementation of the resilience duty for Ofwat with a view to giving a similar and consistent duty to other

7. Independent Assessment of the Third National Adaptation Programme - Climate Change Committee (theccc.org.uk)
8. Gov - National Adaptation Framework (NAF) (www.gov.ie)
9. Regulation & Resilience - NIC

regulatory and industry oversight bodies. This duty would need to incorporate climate risk analysis and stress testing, driving regulators to cascade and enforce high-level goals, milestones, and KPIs. This would ensure that compliance drivers focus the minds of asset owners and promote widespread action. We are also seeing the establishment of a national energy system operator with an explicit resilience duty, however, potential delays due to defining the scope suggest that the urgency of the issue is missing. Such bodies should also address interdependency risks and enable the development of business cases to facilitate investment across sectors and organisations.

C. Highlighting the benefits of adaptation and resilience:

Beyond focusing solely on the risks of climate change, it is crucial to emphasise the positive impacts of investing in adaptation and resilience measures. This includes highlighting the potential for improved liveability, attractiveness, and affordability. It should also include consideration of how adaptation-related measures could help to meet other policy objectives such as environmental improvement, resonate with a wider audience and garner greater support for action.

By implementing these recommendations, the UK Government can provide a clear steer on climate resilience and adaptation for the infrastructure sector, ensuring a more resilient and sustainable future for the nation.

Recommendations for a Clear and Impactful Analytical Approach to Climate Resilience and Adaptation in UK Infrastructure

The UK would benefit from a clear and impactful analytical approach to better address the challenges of climate change and build the resilience of the UK's infrastructure. This approach should be rooted in economics, with clear metrics and indicators of success or failure over time, to build a strong business case for adaptation and resilience investments.

A. Prioritising improved adaptation metrics and indicators:

The sector would benefit from sector-specific performance metrics, including leading and lagging indicators, directly related to asset performance. These metrics should incorporate long-term dynamic measures such as adaptive capacity and adaptation pathways to provide a comprehensive understanding of progress and effectiveness. Providing clear guidance on climate change scenarios and data interpretation would help organisations understand which scenarios to use and how to interpret data on vulnerability and risk. Furthermore, developing common approaches or standards for

quantifying and assessing physical risks and resilience would aid decision at every stage of the project lifecycle, going beyond just risk assessment. This can build on the work undertaken by Coalition for Climate Resilient Investment (CCRI) and Institutional Investors Group on Climate Change (IIGCC) in the development of the PCRAM method.[10]

B. Defining adaptation metrics and indicators for each sector:

Adaptation metrics and indicators should be developed for each infrastructure sector. This will enable the development of clear goals and benchmarks for measuring progress and ensuring accountability.

Specific commitments should be established for specific asset types (e.g. public buildings, such as schools and hospitals), particularly for extreme weather and heat events. We see a significant opportunity to promote nature-based solutions in this context. This could leverage the benefits of natural systems, such as floodplains and wetlands, while delivering valuable co-benefits. This approach can provide cost-effective and sustainable solutions.

C. Greater focus on the economics of adaptation:

Improving data collection to inform benefit-cost analysis can improve the quantification of economic benefits of adaptation and resilience investments. A more robust assessment of the costs of adaptation and failing to adapt versus the benefits of adaptation would inform decision-making, and send a signal to the market informing funding requirements. Infrastructure planning and investment tend to focus on individual projects rather than on the overall system, leading to inefficient use of resources and missed opportunities for synergy. Furthermore, streamlining the process of accessing funding for adaptation and resilience projects will encourage investment and accelerate progress. This will ensure that funding is readily available to support the implementation of necessary measures. There needs to be significantly more attention on funding for maintenance, as this will ensure that infrastructure is properly managed, maintained and less vulnerable to climate change impacts. This proactive approach will reduce the need for costly repairs and replacements in the future.

Recommendations for Mobilising Action and Bringing Private Sector Expertise to Climate Resilience and Adaptation in UK Infrastructure

By bringing private sector expertise to government and regulatory policy, decisions, and implementation, the UK could harness the innovation, efficiency, and financial resources of the private sector to accelerate progress towards climate resilience and adaptation. This could bring public sector benefits from the diverse perspectives and specialised knowledge of the private sector, leading to more effective and sustainable solutions.

10. Net zero resilient infrastructure: Net zero and climate resilient investing begins in the physical world (iigcc.org)

A. Government-owned and regulated assets:

The owners and operators of government-owned and regulated assets should review investments in operation and maintenance for adaptation. Most of the assets we need by mid-century are already built. We now need to think about how to adapt existing assets through maintenance and operations, considering climate risks and adaptation requirements as well as new capital or capital enhancement investments.
We want to see better integration and delivery of climate risk and adaptation assessments into government decisions. The Green Book provides guidance on this, but it is not being implemented consistently across government. Making climate risk and adaptation planning a mandatory gate review for government spending decisions could better prioritise adaptation in government policies and programmes.

B. Developing plans for industry action and investment:

Government, regulators, and the industry should develop clear plans to accelerate action and investment. These plans should capture climate resilience in decision-making, including procurement decisions, and clearly demonstrate the impact of actions on managing climate risks. Modelling the risks of cascading failures between sectors would inform policy development and provide a more comprehensive approach to risk management.

Developing investment models, such as regulated asset base (RAB) and public-private partnerships (PPPs), could attract private funding into assets. This could provide additional resources for adaptation and resilience investments, improving the infrastructure sector's resilience to climate impacts.

C. Public-private working group:

We welcomed the previous government's new cross-departmental Climate Resilience Board, and suggest that this is retained. In addition, the Cabinet Office should consider how best to ensure that government and industry are working together effectively. We suggest that a public-private working group could help to develop clear plans to align policy and regulation with the benefit of practical industry experience.

By implementing these recommendations, the UK Government can mobilise action, bring private sector expertise to the table, and ensure that the public sector leads by example in building a more resilient and sustainable infrastructure for the future.

Further Considerations

Beyond the physical infrastructure itself, successful climate adaptation and resilience planning should consider the social fabric of communities, which could be significantly impacted by climate change. Incorporating equity and justice considerations into adaptation and resilience decisions and delivery would help to ensure that everyone benefits from these efforts.

Insurance can also play a key role in managing climate risks by valuing resilience and incentivising adaptation investments through reduced premiums and potentially like-for-better rather than like-for-like replacements. It is important to recognise that adaptation and resilience are place-specific challenges and exposure and vulnerability to climate hazards are interrelated. To reduce risk and therefore insurance premiums, infrastructure sectors will need to act collectively. Some infrastructure may become uninsurable. The government has already intervened through Flood Re to support homes in areas of greatest flood risk, but a long-term successor is needed, potentially including other sectors. This requires a national conversation and an agreed vision and strategy for national resilience.

Furthermore, it is important to acknowledge that trade-offs will exist between different adaptation and resilience measures, and these need to be carefully considered. Successful adaptation and resilience require collaboration across sectors and disciplines, highlighting the importance of collaboration between different stakeholders. Finally, the need for innovation cannot be overstated, as new technologies and approaches will be essential for adapting to the challenges of climate change.

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