



Comisiwn **Seilwaith**
Cenedlaethol **Cymru**
National **Infrastructure**
Commission **Wales**

A Perfect Storm:

Is Wales doing enough to coordinate action and engage communities in adapting our infrastructure to a changing climate?



A report from the National Infrastructure
Commission for Wales (NICW)

October 2025

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The National Infrastructure Commission for Wales (NICW) was established in 2018 as an independent, non-statutory, advisory body to Welsh Ministers.

Its key purpose is to analyse, advise and make recommendations on Wales’ longer term strategic economic and environmental infrastructure needs over a 5–80 year period.

NICW conducts studies into Wales’ most pressing infrastructure challenges and makes recommendations to the Welsh Government.

The advice provided by NICW will be impartial, strategic and forward looking in nature.

NICW is accountable to the Welsh Ministers for the quality of its advice and recommendations.



Fire brigade rescuing car stuck in flood water, Treforest

Executive summary

Climate change is already impacting Wales, and we must act now to prepare our communities and infrastructure for a changing climate. In recent years, Wales has experienced devastating floods and record-breaking heatwaves, showing that the climate crisis is not a distant threat but a present reality. Scientific projections indicate these extremes will intensify – sea levels could rise by over a metre by 2100, average summer temperatures may climb over 4°C, and extreme rainfall events might double in frequency by the 2050s. Already, more than 245,000 properties in Wales are at risk of flooding today. Different areas face different challenges: cities suffer heat stress, rural communities face drought, and coastal towns battle erosion. This means Wales urgently needs to strengthen its resilience, ensuring our infrastructure and our communities can withstand and adapt to these growing impacts.



Reservoir at Llwyn Onn during a heatwave

Wales's current approach to climate adaptation is falling short. In recent years there has been a strong focus on cutting carbon emissions (often referred to as “net zero”), but much less emphasis on adapting to the impacts of climate change. There are no clear targets or legal obligations driving adaptation comparable to those for emission reduction. As a result, efforts to prepare for floods, heatwaves, and other risks have been

uneven and fragmented. Aging infrastructure is being stretched by new weather extremes that it wasn't designed for. Different organisations plan for climate risks in isolation using different datasets, and many public bodies lack the resources or frameworks to plan long-term.

The Welsh Government so far hasn't fully used tools like the Climate Change Act's powers to require climate adaptation plans from public agencies.

Meanwhile, communities often feel left out of the conversation. Consultations on climate-related projects are sometimes done in a piecemeal way, one project at a time, without a bigger picture, leading to “consultation fatigue” and public frustration. Those most vulnerable (for example, flood-prone or disadvantaged communities) may feel unheard and disengaged from decision-making. If we continue with business as usual, Wales risks increasingly severe damage to homes, businesses and the natural environment, and a public that is unprepared for what's coming.

This report puts forward a set of recommendations to urgently raise Wales's game on climate adaptation. The overarching goal is to put adapting to climate impacts on an equal footing with reducing emissions and to integrate climate resilience into all aspects of policy, planning, and investment. The key aspects of our recommendations are:

Establish clear leadership and accountability for adaptation. NICW calls for a new Climate Adaptation law (Act) for Wales that would set legally binding targets for climate resilience and define who is responsible for what. This law would make preparing for climate change a core mission of the Welsh Government, just like cutting carbon. It would require every public body to plan for climate risks and report on progress, ensuring no one can ignore the issue.

Put people and communities at the heart of climate adaptation. The report stresses that adaptation will be most effective and fair when the public is involved from the start. Communities have local knowledge about flooding, heat, and other issues, and they should help shape the solutions. We recommend that early, inclusive public engagement become standard practice for all climate-related plans and projects and that dedicated teams and people are established to enact this. Instead of viewing consulting with people and communities as a purely formal duty, authorities should co-design adaptation strategies with them.

Integrate climate resilience into the planning and development system. Decisions about land use, infrastructure and development today will either increase or reduce our future vulnerability to climate change. NICW's report emphasises the need for stronger planning policies and standards so that every new development in Wales is designed with the future climate in mind. It recommends that the Welsh Government update Planning Policy Wales to explicitly require consideration of climate adaptation in all types of development plans and projects.

Align funding and finance with climate resilience goals. A key barrier to adaptation is how projects are appraised and funded. It's often easier to secure money for projects with immediate economic benefits than for preventive measures whose payoff is avoiding future loss. We recommend changing the rules so that preventing climate damage is valued properly in investment decisions. In particular, we urge the UK Treasury to update its Green Book (the guidance used to evaluate public spending) to give more weight to climate adaptation benefits. We also repeat our call for a dedicated Climate Adaptation Funding pot for Wales.

Improve data, knowledge-sharing, and collaboration. Effective adaptation relies on good information and learning from experience. We found that data on climate risks in Wales isn't always easily accessible or consistent across organisations. To fix this, we propose creating a "Climate Futures Hub": a central resource to support communities and professionals with long-term planning for climate change. This Hub would serve as a centre of excellence, developing user-friendly tools and information. It would also connect experts and practitioners, acting as a community of practice where lessons from one project can be shared and applied elsewhere.

Our report delivers a clear and urgent message: Wales needs to integrate climate adaptation into everything it does, from high-level legislation to local action, to safeguard its future. By implementing these recommendations – enshrining adaptation in law, improving coordination, engaging communities, updating planning rules, reforming funding mechanisms, and enhancing knowledge-sharing – Wales can significantly reduce the harm that climate change might otherwise inflict on its people, economy, and environment. Our advice, echoing the clear message of the Stern Review in 2006, is that acting now will be far less expensive and disruptive than delaying.

Achieving our vision requires commitment across government and society, but it is within reach. NICW is urging the Welsh Government and other relevant organisations to move swiftly from planning to implementation. With decisive action, Wales can lead by example on adaptation, ensuring that present and future generations are kept safe and can prosper in the face of our changing climate.

Our vision for climate resilient infrastructure and engagement in Wales

By 2050, Wales will be a global leader in climate resilient infrastructure. This means ensuring fair and equitable access for all individuals, communities, and businesses to infrastructure that is flexible, inclusive, and built for the long term and delivering value for money in how we invest and adapt. Our infrastructure will not merely withstand the impacts of climate change; it will actively support us in adapting and thriving in an evolving world.

Central to this vision is fairness, both now and for future generations. It is informed by the lived experiences of communities across Wales, particularly those who have historically had limited influence over infrastructure planning and development. By engaging directly

with communities and empowering them in decision making, we will create and maintain infrastructure that enhances people's wellbeing, strengthens their sense of place, and realises their aspirations.

This network of infrastructure will be coordinated to optimise investment and lead to strategic planning and coordination across sectors to achieve the best results in adapting to our changing climate.

Through strong leadership, inclusive engagement, and a sustained focus on investment for long-term resilience, we will build a Wales where infrastructure not only protects communities from climate impacts but also enables us all to flourish.

resilience.

Our recommendations

A Climate Adaptation Framework

- 1 Climate Adaptation Bill**
In the next Senedd term, the Welsh Government should introduce a Climate Adaptation Bill which should set legally binding targets for climate adaptation and create a framework for action and change.
- 2 National Infrastructure Resilience Unit**
The Welsh Government should establish a National Infrastructure Resilience Unit, with an associated Welsh Climate Adaptation Liaison Forum, to address the unclear ownership of the systemic risks of climate change.

Rolling out effective engagement in Wales

- 3 Engagement with communities**
Early, inclusive and participatory engagement should be undertaken with all communities on climate adaptation strategies and plans.
- 4 Chief Participation Officer**
By 2028, the Welsh Government should create the position of Chief Participation Officer. This role will lead across government to improve how citizens are involved in decisions.

Improving the Planning System

- 5 Statutory guidance for community engagement**
In the next Senedd period, the Planning Acts should be amended to require the production of statutory guidance requiring meaningful community engagement at all stages of the planning system.
- 6 Review Planning Policy Wales and new Technical Advice Note**
By 2028, the Welsh Government should review PPW to ensure climate adaptation is addressed throughout. A TAN on Climate Adaptation should also be produced.

- 7 Environmental Impact Assessment and Strategic Environmental Assessment**
By 2028, secondary legislation and guidance should be amended for climate adaptation to be specifically part of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes.

Infrastructure project assessment

- 8 Green Book amendments**
The UK Government should amend the 'Green Book' to give equal weighting to climate adaptation when assessing new infrastructure projects.

A Climate Futures Hub

- 9 Establish a Climate Futures Hub**
In the next Senedd term, the Welsh Government should establish a 'Climate Futures Hub' as a centre of excellence and support for engaging communities in long-term infrastructure and climate adaptation planning.

Funding

- 10 Climate Change Adaptation and Resilience Fund**
We repeat our 2024 flooding report recommendation for a new cross-sector climate change and adaptation resilience fund.

Data

- 11 Data platforms**
Within the Climate Futures Hub, or separately, the Welsh Government should provide, or otherwise facilitate platforms for a Welsh climate data and intelligence body, community accessible climate intelligence and regional climate data commons for professionals.

Cross border issues

- 12 Intergovernmental coordination**
The Welsh Government should advocate for greater inter-Government coordination and representation across the UK on infrastructure resilience.

Acknowledgements

The National Infrastructure Commission for Wales would like to acknowledge and thank all of those organisations and individuals that have provided input, opinion and advice into this project.

This includes the community organisations we have spoken to or engaged with through our work, with their direct connections to the areas they represent and their honest testimonies and lived experiences. In Grangetown specifically, we would like to thank the three community groups; the Grange Pavillion Youth Forum, SEF Cymru and Green Soul in participating in the engagement exercises. We acknowledge the [Cardiff University Community Gateway](#) project in establishing a hub of community activity in Grangetown from which our research could draw upon such a rich and diverse pool of talent and work.

We would like to thank members of the two Project Reference Groups (PRG) for their valuable insights and opinions which have been fundamental to our research. In addition, we are grateful to the research teams at Arup and the School of International Futures for their flexible and honest ways of working and their ability to take on the challenge to be far-reaching in their thinking.

In recognising the contributions of these individuals, our recommendations should not be seen as an official endorsement of any individual or organisation we engaged with (directly or indirectly) or the companies which undertook the primary research on our behalf.

Abbreviations

Abbreviation	Meaning
CaBA	Catchment Based Approach
ARP	Adaptation Reporting Power
CJC	Corporate Joint Committee
DBW	Development Bank of Wales
EIA	Environmental Impact Assessment
LRF	Local Resilience Forum
NICW	National Infrastructure Commission for Wales
NRW	Natural Resources Wales
NWC-REPS	North Wales Regional Emergency Planning Service
Ofcom	Office of Communications
Ofgem	Office of Gas and Electricity Markets
Ofwat	Water Services Regulation Authority (Office of Water Services)
ORR	Office of Rail and Road
PRG	Project Reference Group
PSB	Public Service Board
SEA	Strategic Environmental Assessment
SOIF	School of International Futures
SuDS	Sustainable Drainage Systems
UKCP09	UK Climate Projections 2009
UKCP18	UK Climate Projections 2018
YGC	Ymgynhoriaeth Gwynedd Consultancy

Welcome



Dr David Clubb

Chair

The impacts of climate change will shape the future of our communities. Yet it is these very communities that hold the key to building a cohesive and effective response, one that enables all citizens of Wales, alongside our natural environment, to thrive.

The work undertaken to support this report has offered valuable insights and evidence that underpin our recommendations. Along the way, we have built relationships with inspiring individuals who embody the most constructive attitudes towards the climate challenge; resilient, hopeful, inquisitive, and collaborative.

Too often viewed as a complicating factor in policy-making, our experience demonstrates that meaningful community involvement is not just desirable but essential. Strong institutional coordination between public bodies and infrastructure providers is also a vital component in managing systemic risks.

Wales cannot effectively adapt to climate change without both genuine community engagement and effective institutional alignment. Together, they form a critical foundation for how successfully our society will navigate the challenges of the coming decades.



**Helen
Armstrong**

Lead Commissioner

The future has not yet been written!

We want to leave to children born in 2100 a healthy thriving world for humans, animals and nature. Yet the climate is changing rapidly. Actions to reduce carbon emissions are slow and piecemeal. Extreme weather patterns over the next century are already locked in.

Wales must therefore adapt its infrastructure to withstand the extreme weather events we will face. This report offers solutions to equip Welsh Government, public bodies and the infrastructure sectors to respond to the challenges that lie ahead. It also outlines ways to engage diverse communities through co-designed creative activities, a crucial part of strengthening citizen engagement and social justice for the communities who will be affected.

I hope this report provokes and inspires you to action. There is no time to lose.



Steve Brooks

Lead Commissioner

This report represents the culmination of work that has brought together evidence, expertise and lived experience to understand how Wales can strengthen its resilience to climate change.

Our message is clear: Welsh infrastructure built for yesterday's climate is under strain today, and unless we act with urgency, the gap between the risks we face and our preparedness will only widen. Our work shows that action now: improving data, embedding adaptation in planning, investing in resilience, and strengthening engagement – can reduce costs, protect communities, and build public confidence.

Our recommendations reflect this: practical, evidence-based steps to put adaptation on an equal footing with net zero. By implementing them, Wales can lead by example in creating infrastructure that is fit for the future.

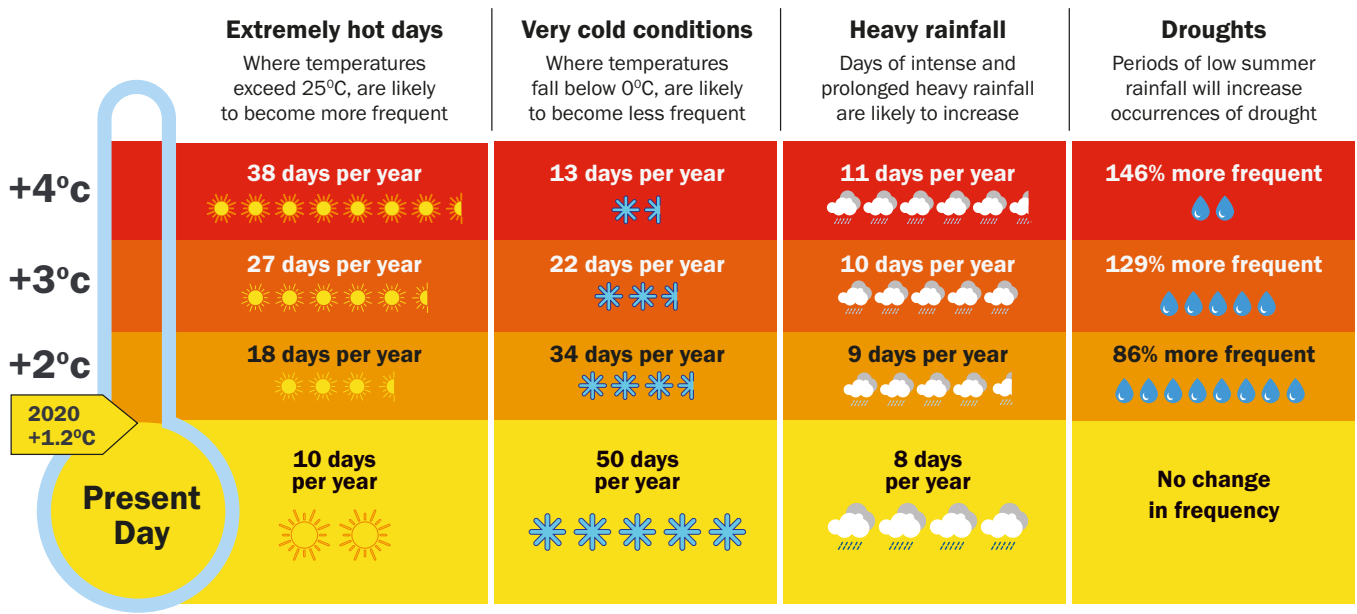
Background and context

The Current Legal, Policy and Operational Framework

Wales is already experiencing the disruptive effects of climate change. From the devastating floods of 2020 to the record-breaking heatwaves of 2022 and 2023, the evidence is clear: the climate crisis is not a future threat, it is a present and escalating reality.

According to the UK Climate Projections (UKCP18), sea levels around Wales are projected to rise by up to 1.1 metres by 2100. Meanwhile, average summer temperatures could increase by more than 4°C, and the frequency of extreme rainfall is expected to double by the 2050s.

Figure 1: Global warming and future high-impact weather in the UK
(Source: Climate Adaptation Strategy for Wales)



These changes will not affect all communities equally. Urban areas are particularly vulnerable to heat stress due to the urban heat island effect, whereas rural and upland regions increasingly face water scarcity. Coastal towns and villages are already contending with erosion and tidal flooding. In addition, different population groups will also experience different impacts depending on their age and underlying health conditions.

Climate Change Act 2008

The United Kingdom was among the first countries to legislate for climate adaptation. The principal legislative basis is the Climate Change Act 2008, a law that not only set carbon reduction targets but also created a statutory framework for adaptation.

A key provision of the Act is the UK Climate Change Risk Assessment (CCRA) which requires the UK Government to periodically (every five years) assess the risks and opportunities from climate change for the UK. This is known as the Climate Change Risk Assessment. The first CCRA was delivered in 2012, and subsequent ones (2017 and 2022) have followed. The Act also mandates that the UK Government seek advice on the risk assessment from the expert body it established (now the Climate Change Committee, CCC). This advice, known as the Climate Change Risk Assessment – Independent Assessment (CCRA-IA), provides an evidence base that underpins adaptation planning by all four governments across the UK.

In addition, Sections 61–67 of the Act gives the government the authority to require certain organisations to produce climate adaptation reports. The Act designates “reporting authorities”, defined broadly as those with public functions or delivering essential services (for example, utility companies, transport network operators, local authorities, regulators). Ministers can issue directions to these bodies to prepare reports on climate impacts on their operations and their proposals and policies for adapting to these impacts.

This power was intended to ensure critical sectors are systematically planning for climate change. Notably, the Act also accounts for devolution: UK Ministers can require reports for non-devolved functions (mostly in England or UK-wide sectors),

while Welsh Ministers have parallel powers to direct organisations exercising devolved functions in Wales to report on adaptation. Wales has so far approached adaptation reporting through broader sustainable development duties rather than issuing formal directions under the UK Act.

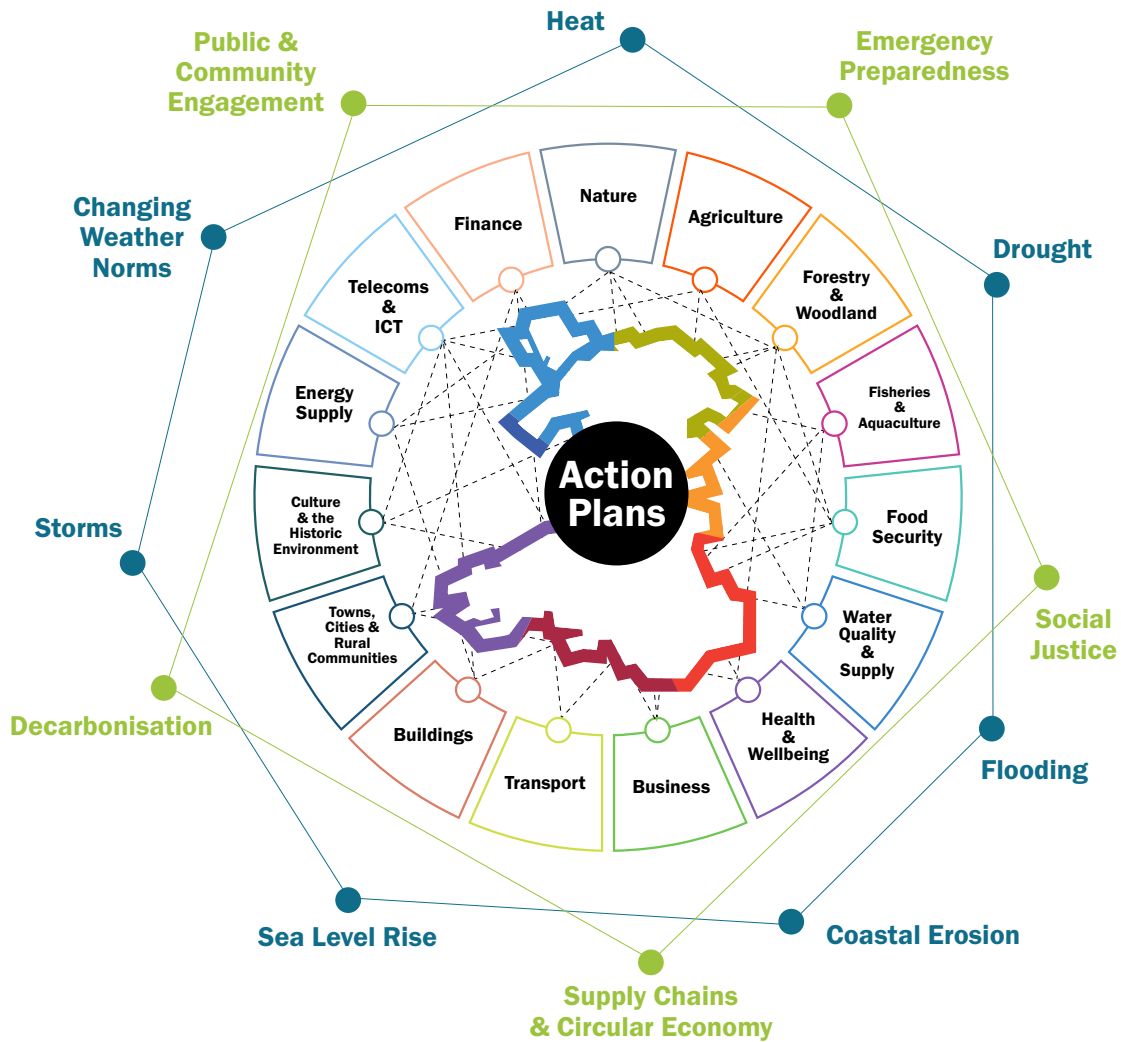


Climate Adaptation Strategy for Wales

The Welsh Government’s Climate Adaptation Strategy for Wales (2024) addresses these challenges with a clear and urgent call to action: adaptation must be integrated across all levels of government, policy, and society. The strategy includes 15 cross-sector adaptation action plans, each outlining interconnected measures necessary to deliver effective climate adaptation within their respective systems.

These plans are supported by overarching initiatives aimed at enhancing public and community engagement, governance, monitoring, and reporting.

Figure 2: Climate Adaptation Strategy for Wales Framework



Flooding and coastal erosion

Flooding represents the most immediate and visible climate risk in Wales, with over 245,000 properties currently threatened by flooding from rivers, the sea, or surface water. Coastal erosion is accelerating, putting more than 2,000 properties at risk by the end of the century if no proactive measures are undertaken.

Building on the National Strategy for Flood and Coastal Erosion Risk Management (2020), the

adaptation strategy commits to developing a comprehensive 30-year national flood and coastal resilience strategy by 2026. Key measures include investing over £214 million in flood and coastal erosion risk management between 2021 and 2026, expanding the use of sustainable drainage systems (SuDS), supporting community-led flood planning initiatives, and promoting nature-based solutions such as wetland restoration and managed realignment.

Additionally, NICW produced its own [report on flooding](#) in October 2024, outlining several recommendations to enhance Wales' framework and system of flood risk management and improved resilience. Due to the NICW report and the adaptation strategy being published around the same time, these recommendations were not incorporated into the strategy, and NICW continues to advocate for positive developments in this critical sector.

Wind and rain

Storms and rainfall have already increased in severity and frequency, and are likely to continue to worsen due to climate change. This will cause severe impacts on emergency response teams, and potentially require a policy response to improve the resilience of the built environment and infrastructure more generally.



Flooding in Pontypridd, November 2024

Heat, drought, water scarcity and wildfires

Wales is experiencing hotter, drier summers and increasingly frequent drought conditions. The summer of 2022 was the hottest recorded, with temperatures surpassing 37°C in parts of Wales, posing significant risks to public health, agriculture, and water supplies. To mitigate these risks, the strategy promotes urban greening, tree planting, climate-resilient building designs, and integrated water resource planning.

Infrastructure is directly impacted by high temperatures; for example, railways can be damaged by overheating, an impact seen on routes in July 2025. High temperatures can limit the ability of conventional power stations to operate due to the limits of cooling capacity. And grid lines hold less capacity at higher temperatures, straining a system that is already dealing with increased demand in summer due to air conditioning and electric vehicles.

An increased frequency of droughts is also likely to heighten the risk of wildfires. Although there is a Wales Wildfire Board, specific information regarding future wildfire risks in Wales is currently limited although the Wales Wildfire Board and NRW have highlighted increasing risks under hotter, drier summers. Estimates suggest wildfire events are likely to become both more frequent and more severe.

Biodiversity loss and ecosystem fragility

Climate change is accelerating biodiversity decline. Wales has already lost 73 species since 1970, and 17% of its native species are at risk of extinction. The Welsh Government has committed to becoming 'nature positive' by 2030 and is piloting landscape-scale planning approaches. Key actions include restoring 20,000 hectares of peatland by 2030, expanding woodland cover to 24% of Wales' land area, and integrating biodiversity into planning and infrastructure decisions. Progress to date has been uneven. For example, peatland restoration

achieved just over 1,650 hectares between 2020 and 2022; slightly ahead of the initial targets of 600–800 hectares per year; yet total coverage remains modest in absolute terms. This highlights the gap between ambition and delivery. Woodland expansion rates are currently below target, highlighting the gap between ambition and delivery.

Infrastructure vulnerability

Critical infrastructure is increasingly exposed to climate risks. For example, the February 2020 floods caused over £180 million in damage to infrastructure and property. The adaptation strategy calls for adaptation to be embedded in planning policy and consenting processes. Planning Policy Wales has already been updated to reflect the urgency of the Nature Emergency.

A further area of particular concern to Wales is the legacy of disused coal tips. Many are located in areas prone to heavy rainfall and flooding, posing risks to nearby communities. It is vital that these

issues are considered as part of Wales's wider infrastructure adaptation challenge, and the strategy includes explicit mention of coal tip safety. The UK and Welsh Governments have announced a combined £220 million investment to secure disused coal tips across Wales.

Health and social inequality

Climate change disproportionately affects vulnerable groups including children, older people and those with underlying health conditions. During the 2022 heatwave, hospital admissions for heat-related illnesses increased by 30% compared to the previous year. The strategy emphasises climate-resilient healthcare systems, community support networks, and a just transition that protects those most at risk. However, it places limited emphasis on preventative measures that would reduce health impacts before hospital admission, such as heatwave preparedness in communities and schools.



Llandudno pier after storm damage

Governance, engagement and behaviour change

The adaptation strategy is underpinned by the Well-being of Future Generations (Wales) Act 2015. It promotes inclusive governance and cross-sector collaboration with local authorities and public bodies through activity such as Wales Climate Week. It explains how the Welsh Government is investing in climate communications to help build public understanding of the risks and actions people can take to build resilience to climate change within our homes and communities. It also commits to involving people in policy decision making through public engagement activity.

This NICW report evaluates how public engagement on climate change adaptation and resilience can be improved and how our infrastructure providers can be better prepared to communicate with each other, and the public, using consistent information.

Climate Action Wales: Public Engagement Strategy 2023 to 2026

In 2023, the Welsh Government published Climate Action Wales: Public Engagement Strategy 2023 to 2026, setting out how it intends to involve people and organisations in tackling the climate and nature emergencies. The strategy aims to raise awareness, encourage behaviour change, and support collective action to reduce emissions and adapt to climate impacts.

The strategy recognises the importance of engaging a wide cross-section of society. It highlights the need to make climate change relevant to people's everyday lives, provide accessible information, and showcase positive examples of change already underway. Its focus is on communication, education, and partnership working to build public understanding and mobilise action across sectors.

The document identifies several principles that should underpin public engagement in Wales, including:

- making climate change relevant to people's daily concerns
- encouraging collaboration between government, communities and organisations
- promoting practical actions that individuals and groups can take
- embedding climate considerations into existing networks and programmes.

These principles underline why public engagement is a necessary part of Wales's response to the climate crisis. However, the strategy also acknowledges that turning awareness into lasting behaviour change is a challenge, and requires consistent effort and investment.

To this end, the strategy sets out actions to:

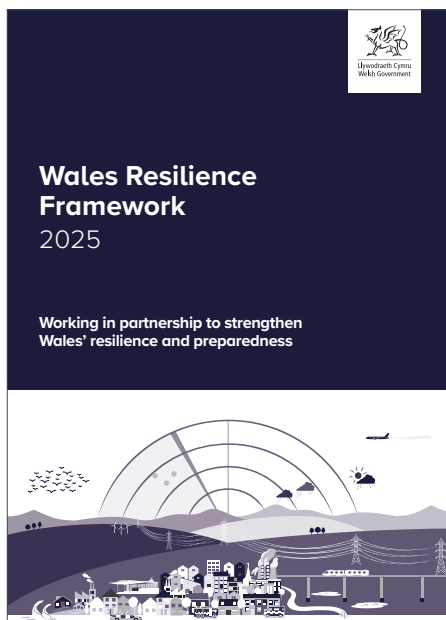
- develop targeted campaigns and educational resources
- work with schools, businesses and community groups to mainstream climate action
- improve the accessibility of information and guidance
- track and evaluate the impact of engagement activities over time.



For NICW the message is clear: engaging the public on climate action must go beyond communications and awareness-raising. Whilst the Welsh Government’s strategy is a useful step in building understanding, it does not sufficiently address how communities can be empowered to participate directly in decision-making about infrastructure and adaptation. Our work therefore complements and extends this strategy by focusing on co-design, participatory futures, and creative approaches that give people real influence over the choices that shape their resilience.

Wales Resilience Framework 2025

In 2025, the Welsh Government published the Wales Resilience Framework, a national plan for how Wales will prepare for, respond to, and recover from emergencies. The framework provides the overarching structure within which risk management, civil contingencies and resilience planning are carried out across government, local authorities, emergency services and partner organisations.



The framework sets out a vision of a “resilient Wales” where risks are better understood, preparation is embedded across all levels of government and society, and responses are coordinated and effective. It emphasises prevention and preparedness as core principles, alongside the need to strengthen recovery and adaptation in the face of long-term challenges such as climate change.

The framework identifies several priorities that underpin resilience in Wales, including:

- improving the national understanding of risk and ensuring transparent communication of threats
- enhancing collaboration between UK Government, devolved administrations and local partners
- embedding prevention and preparedness in public services and infrastructure planning
- ensuring that recovery is equitable and supports long-term adaptation.

These priorities underline that resilience is not only about crisis response, but about building systems that can withstand and adapt to shocks and stresses. The framework makes explicit reference to climate risks, including flooding, extreme weather and the legacy risks of disused coal tips in South Wales, highlighting the close links between resilience planning and climate adaptation.

To this end, the framework commits to:

- developing stronger risk assessment processes at national and local levels
- supporting Local Resilience Forums to coordinate planning and response
- aligning resilience work with the Well-being of Future Generations Act and the climate and nature emergencies
- securing investment and capabilities that can be sustained over the long term.

The framework provides an important foundation for national preparedness, but it remains weighted towards emergency management rather than long-term adaptation. NICW's perspective is that resilience planning and infrastructure policy need to be more tightly integrated, so that Wales not only responds effectively to crises but actively reduces risk over time. Embedding resilience thinking in infrastructure investment, planning and community engagement will ensure that Wales builds systems capable of withstanding the pressures of a changing climate, rather than simply reacting to their impacts.

Deliberative engagement¹ review

In June 2025, the Welsh Government published a [Review of Deliberative Engagement on Climate Policy Development](#) which examines how inclusive, participatory methods can improve climate change policy-making in Wales.

The review found that while deliberative engagement had begun to take root in Wales, past efforts lacked coordination, with limited sharing of lessons and insufficient lasting impact on policy. The review highlights several benefits of using deliberative engagement methods in climate change conversations and policy development, including:

- broadening participation
- incorporating lived experiences
- fostering informed deliberation; and
- increased legitimacy.

These benefits illustrate why deliberative engagement is a powerful tool for climate change conversations. However, the review also noted

that to fully realise these advantages, better structures and support are needed as, currently, initiatives have been sporadic, without a sustained strategy or shared learning across government and communities.

To this end, the review makes four recommendations to:

- foster a welcoming political culture by embedding public involvement
- connect a community of practice by co-ordinating engagement efforts
- build deliberative capacity by developing skills and resources
- ensuring sustained engagement by making deliberation ongoing.

For NICW the message is clear: how we make decisions is as important as what decisions we make. By embracing these findings, and going further by bringing diverse voices to the table, learning together, and committing to ongoing public dialogue, Wales can strengthen its climate change conversations and ensure its policies have the understanding, support, and insight needed for effective implementation.

Whilst NICW's work in this area does not seek to duplicate this review; our research and recommendations help to reinforce many of the findings of this review. Our work also recognises that deliberative engagement is just one of a range of participatory approaches. We are looking at co-designing creative approaches to engagement and these will be explored through our research.

1. Deliberative engagement is a structured approach to decision-making that prioritises informed discussion and reasoned debate among a representative group of participants. It goes beyond traditional consultation by actively involving people in exploring issues, weighing options, and shaping outcomes through dialogue.



A large, expanding sinkhole in a housing estate in Pant, Merthyr Tydfil

Our remit

The impacts of climate change will require infrastructure to be planned and delivered differently. In its third year of work, NICW explored how diverse communities respond to and engage with decision-making around infrastructure development and climate adaptation which was enabled by futures thinking. Our aim was to identify effective engagement practices across different community sectors and trial their practical application within specific local contexts.

As part of this process, we sought to amplify voices that are often less heard, encouraging communities to creatively consider how they can adapt in the face of climate change.

We recognise that infrastructure providers are already factoring climate impacts into their service planning. However, we also understand that not all providers operate at the same level of preparedness or coordination. Individual providers often consult the public separately, leading to inconsistent messages about the cumulative impacts of climate change. This

approach can result in "consultation fatigue," leaving communities uncertain about the value or outcomes of their involvement.

We aimed to investigate which climate change projections infrastructure providers rely upon and whether this data is being effectively shared. Additionally, we explored whether other future projections, such as population growth, consider climate impacts sufficiently when guiding strategic decisions about spatial planning, growth, and future infrastructure needs.

We were particularly interested in how past climate projections have been utilised in decision-making processes and communicated to the public. Our hypothesis is that actual observed climate data has tended toward the higher end of previous projections, whereas infrastructure providers and public bodies typically plan using median projections. We wanted to test this assumption and understand how it influences both decision-making and public communication around climate adaptation.



The NICW approach

NICW works within frameworks aligned with public policy in Wales, applying them over the longer term.

NICW aims to:

1. Provide radical, challenging and evidence-informed advice and guidance to a variety of audiences, but principally the Welsh Government, that will inform and future-proof decisions on infrastructure deployment from 2030–2100.
2. Use the frameworks of the Well-being of Future Generations (Wales) Act 2015, the climate and nature emergencies, and the socio-economic duty, to guide our deliberations.
3. Support initiatives, organisations or policies that aim to create and maintain resilient and adaptable infrastructure that delivers wellbeing until 2100 and beyond.

It carries out these aims, upholding its agreed values.

- **Inclusive:** creating a warm and friendly environment within which people feel supported and confident to express their views.
- **Transparent:** pushing the boundaries of reporting in near-real-time on our engagement, and demonstrating publicly how we deal with internal disagreements.
- **Radical:** Commissioners have committed to working out of their comfort zones; we aim to deliver advice, opinions and recommendations that diverge from 'business as usual' in order to alleviate the nature and climate emergencies and deliver on our remit.
- **Challenging:** the Commissioners challenge the status quo with the needs of future generations and an aspiration to do better for the future citizens of Wales.
- **Practical:** the Commission's work is focused on actionable recommendations that move us towards a more sustainable infrastructure for the needs of the people of Wales.



Fire and Rescue Service at flooded street, Pontypridd, November 2024

Project scoping

We began this work in 2023 by issuing a call for evidence. We commissioned Cynnal Cymru to undertake a scoping study. This work aimed to explore how public bodies can better engage with communities and make informed decisions about long-term climate risks.

The project began with a simple but powerful premise: that climate change is not just a scientific or technical issue; it is also a human one. Through literature reviews, analysing the submissions to our call for evidence, and a series of interviews with interested parties and citizens, the research uncovered a consistent theme: while public bodies may understand the science of climate change, they often struggle to communicate it in ways that resonate with people's lived experiences.

Public servants can lack the tools and confidence to speak about climate risks in ways that are empathetic, inclusive, and empowering. Communications are too often dominated by technical jargon or framed in terms of fear and threat, which can alienate audiences and reinforce feelings of helplessness. Meanwhile, traditional one-way methods of engagement, such as maps, leaflets, websites and static information, fail to foster the trust and collaboration needed to prepare communities for, or empower them to be part of the response to, the challenges ahead.

The call for evidence revealed a critical insight: the absence of diverse voices is itself a finding. Many communities, particularly those already marginalised, are fatigued by consultations that offer little feedback or tangible outcomes. Others feel excluded by the technical framing of climate discussions. Yet, where engagement has been meaningful, through storytelling, creative workshops, and participatory design, communities have shown a deep willingness to engage and co-create solutions.

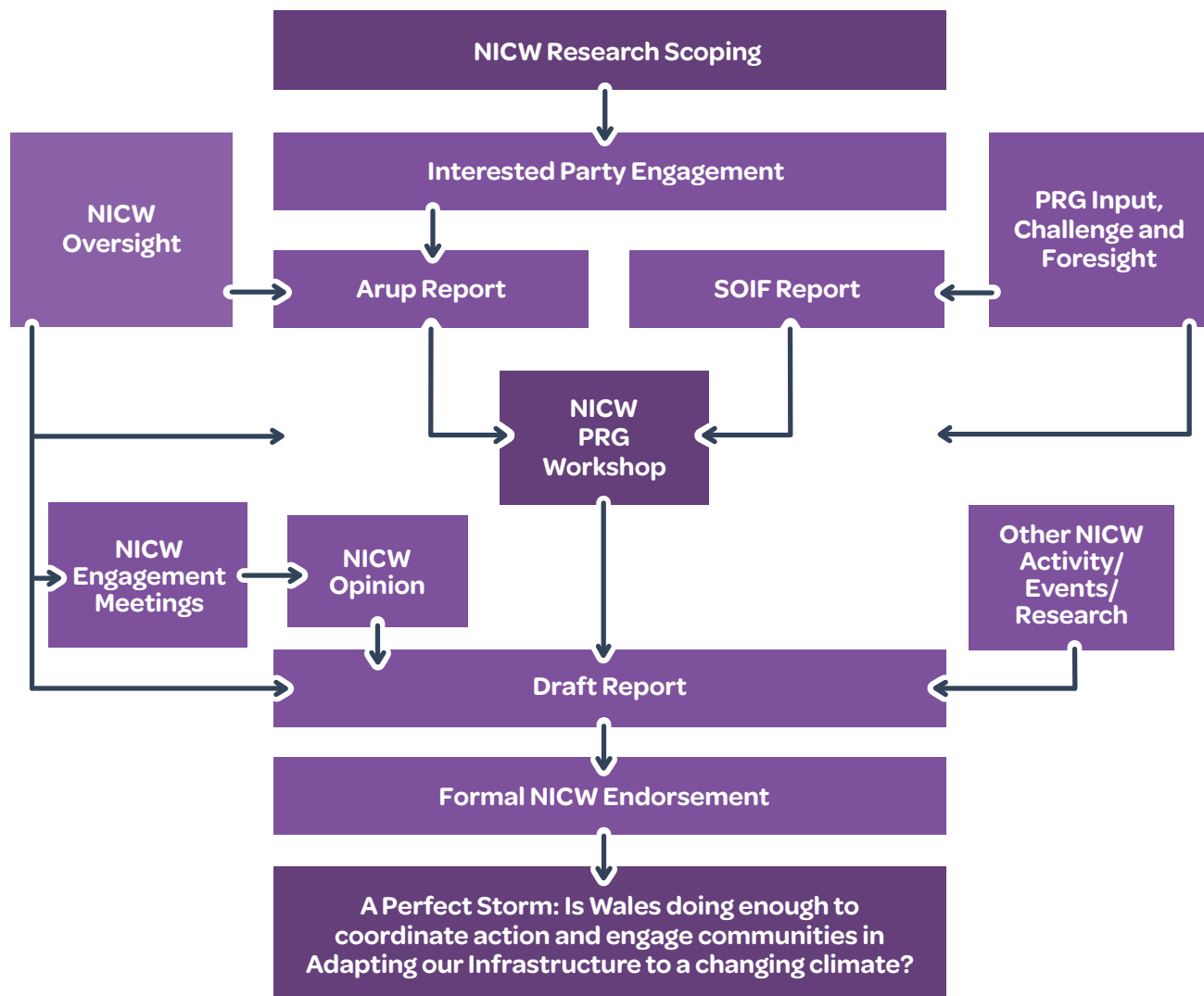
Interviews with professionals and citizens alike painted a vivid picture of climate change as both a visible and emotional reality. Respondents spoke of anxiety, sadness, and a sense of powerlessness. They also highlighted the structural barriers within public bodies: siloed departments, lack of cross-sectoral buy-in, and limited authority for climate-focused staff, that hinder effective action.

The scoping study did not dwell solely on the problems. It offered further suggestions for NICW to take into a full year research programme. Key recommendations included:

- Connect on a human level: This means exploring public servant training in empathy-based communication. Use language that reflects shared values and avoids fear-based narratives.
- Go beyond information sharing: This included embracing two-way engagement by involving communities in co-designing solutions and ensuring their input shapes policy.
- Plan beyond 2050: Adopt long-term thinking in infrastructure planning, using existing frameworks as a basis for assessment.

The report concluded with a call to action for NICW: to treat climate engagement not as a box-ticking exercise, but as a democratic process rooted in trust, transparency, and mutual learning. In doing so, Wales can move from a place of reactive protection to one of proactive resilience.

Figure 3: NICW Report Development



Our research and engagement

Following our initial scoping of this wide-ranging topic, NICW chose two research workstreams to tease out the issues associated with communicating the impacts of climate change to (and from) the public.

- **Engaging Communities**
- **Resilient Infrastructure**

These areas were identified as 'gaps' within existing activity where NICW could add value through further investigation. NICW procured and awarded contracts to SOIF and Arup to undertake these different areas of research. Our [website - nationalinfrastructurecommission.wales](https://nationalinfrastructurecommission.wales) contains further information on the background to each workstream as well as copies of the research report. A summary of the two research reports is given below.



Engaging diverse place-based communities in climate adaptation conversations and the impacts on infrastructure

The project was rooted in Grangetown, Cardiff – one of Wales’ most ethnically diverse communities – and co-designed by the School of International Futures with three local organisations: SEF Cymru, Green Soul, and Grange Pavilion Youth Forum. Over seven months, these partners worked alongside SOIF to test participatory futures methods that could empower communities to engage in long-term thinking about climate resilience and infrastructure.



Rather than focusing on a specific planning decision, the project aimed to build capacity for communities to imagine and influence the future. Through creative, immersive, and structured conversations, participants explored what climate adaptation could mean for their neighbourhoods, and how infrastructure decisions made today will shape the lives of future generations.

The report highlighted four key learnings:

1. Everyone can engage in the future

The project demonstrated that with the right tools and context, people of all ages and backgrounds can engage in complex conversations about climate and infrastructure. From poetry and role-play to walking tours and visioning exercises, participants brought their lived experiences and creativity to bear on issues often reserved for technical experts.

2. Fairness must be central

Climate adaptation is inherently a question of justice—across generations and communities. Participants reflected on who benefits and who bears the costs of infrastructure decisions, and voiced a strong desire for more inclusive, values-driven planning processes.

3. Co-design unlocks impact

Working in partnership with trusted community organisations enabled deeper engagement and more relevant, resonant activities. The co-design process proved essential to building trust and tailoring methods to local contexts.

4. Wales needs a shared resource

To scale this work, Wales must invest in a central hub, such as a Futures Academy, that supports practitioners and communities to share learning, build skills, and sustain momentum. This would help ensure that the creative and participatory approaches piloted in Grangetown can inform infrastructure planning across the nation.

The report outlined six recommendations for consideration by NICW. These are outlined in more detail in Appendix B:

1. Develop community peer-to-peer capacity building to enable local organisations to lead participatory futures work.
2. Build citizen-facing local evidence to support informed, place-based conversations.
3. Connect with democratic renewal efforts to embed climate adaptation in broader civic engagement.
4. Invest in community involvement and evaluate its long-term cost-benefit in infrastructure planning.
5. Build the culture and skills in infrastructure bodies to co-produce with communities.
6. Establish a shared resource such as a Futures Academy to support ongoing learning and collaboration.

In addition to the learning report, a toolkit was also developed to help spread the findings from the report in a practical way for other organisations/communities looking to develop engagement in this area.

The toolkit, which is available on the [NICW website](#) offers a flexible, accessible set of tools to help communities explore the future of their local infrastructure in the face of climate uncertainty. It is about empowering communities to lead the conversation. It avoids one-size-fits-all solutions, instead offering a menu of seven participatory methods – from “Futures Walks” and “Role Play Deliberation” to “Futures Poetry” and “Mindfulness” – that can be adapted to different groups, places, and priorities. These tools are designed to be creative, inclusive, and grounded in local experience, helping participants imagine long-term futures and explore the trade-offs of climate.

The toolkit provides guidance on designing sessions, building trust, and facilitating inclusive dialogue. It encourages organisers to work with community anchor organisations, tailor activities to local contexts, and blend structured and imaginative approaches. It also includes practical tips for facilitators, session templates, and links to additional resources.



Swollen banks on the River Taff after heavy rain, Radyr, Cardiff, January 2023

Climate change projections, realities and infrastructure resilience

We asked Arup to review how current projections for the future climate are being felt in weather patterns we've experienced in Wales over recent years; review how infrastructure is being planned in Wales to take account of future climate; and make bold recommendations for change, based on their findings.

Their research involved a literature review and a series of interviews and workshops with interested parties.

The report sets out how the climate in Wales is changing, with weather observations showing significant shifts compared to past baseline periods, largely driven by human-induced climate change. While these changes broadly align with climate projections, there is considerable uncertainty about how specific variables will evolve, as represented by different climate scenarios. The likelihood of extreme heat and rainfall events is higher than previously estimated, often resulting from complex, hard-to-predict environmental conditions.

The report comments that Wales has robust policies like the [Well-being of Future Generations \(Wales\) Act 2015](#) and [Prosperity for all: A Climate Conscious Wales](#) for taking decisions. However, inconsistent climate adaptation planning across organisations remains a challenge. Some regulated sectors show more maturity in integrating climate risks due to regulatory requirements, however, others do not. Public sector understanding and planning is improving but still relatively immature.

Moreover, there is a need for better coordination and integration across sectors to address interdependencies and cascading risks² effectively.

The report sets out five key challenges which are impacting Wales's ability to deliver climate resilience in its infrastructure network.

It proposes an overarching vision for climate resilient infrastructure in Wales. It then sets out 17 recommendations (reproduced in full in Appendix C) which are based around the challenges identified in the following areas:

- enhancing data collection and sharing
- increasing investment in climate-resilient infrastructure
- strengthening engagement
- aligning policies and regulations with climate adaptation goals
- improving cross-sector coordination and integration.

The themes and challenges identified are significantly interdependent on each other, and need to be considered and addressed collectively to have maximum impact on improving infrastructure resilience to climate change.

The report concludes that adapting Wales' infrastructure to climate change is urgent to ensure the safety and resilience of communities and ecosystems. It highlights the complexity and integrated nature of the change needed to ensure that Wales's infrastructure is resilient to long-term climate change.

However, while significant and extensive change is needed, the report powerfully states that Wales should not be paralysed and 'kick the can down the road'. Action is needed now.

Research oversight

Each piece of research was overseen by Project Reference Groups (PRG) to guide the work, act as a critical friend and to provide further additional comment, advice and suggestions for action. Each PRG met several times during the research phase to inform and advise as work progressed.

2. Cascading risk refers to a situation where a single event or vulnerability triggers a chain reaction of failures or disruptions across inter connected systems. Unlike isolated risks, cascading risks unfold across sectors or domains, amplifying their impact as they propagate.

NICW engagement with communities

As part of its remit, NICW regularly travels throughout Wales to better understand the infrastructure challenges facing different communities and to engage directly with local groups experiencing climate-related impacts.

In June 2024, NICW visited Borth in Ceredigion to speak directly with communities affected by climate change. We met with members of Borth Community Council and local residents to discuss their experiences of coastal erosion and increased flooding events. The meeting included an engaging dialogue with representatives from Natural Resources Wales (NRW) regarding future plans. It highlighted the importance of transparency, early engagement between communities and statutory bodies, and the difficulties arising from sudden budget changes for public organisations.

The Borth community expressed a strong desire to be better equipped to respond independently to extreme weather events, including storms, high tides, and flooding. However, there was a clear sense of frustration about their lack of empowerment. Actions taken by public sector bodies sometimes appeared arbitrary to residents, who felt their own priorities were overlooked.



In November 2024, during a visit to the Bannau Brycheiniog region, NICW met with community members in Crickhowell. We heard first-hand accounts from residents affected by flooding during Storm Dennis in 2020, many of whom were still completing repairs following extensive difficulties with insurance and finding suitable contractors. Residents described ongoing anxiety and fear of future flooding, triggered whenever heavy rain is forecast.

Some residents had specific suggestions about actions that could be taken during future flooding incidents, such as using machinery to clear debris from bridges to improve water flow. While we could not assess the practicality of these suggestions directly, the fact that residents raised them highlights that local communities often have practical ideas for managing flood events. It also suggests that statutory bodies have not adequately communicated the viability or practicality of these local proposals back to the community, likely due to lack of capacity.



During this visit, we also engaged directly with young people, exploring their visions for their future communities and discussing how a changing climate influences their aspirations. We also heard from farmers who expressed the view that they thought their ideas and technical knowledge on flooding issues was not being listened to. They were frustrated by the slow pace of change.



In March 2025, we visited Fairbourne in Gwynedd to better understand how communities and public bodies are collaborating to enhance local resilience to coastal flooding. Fairbourne has received significant media attention regarding climate change and its long-term sustainability.

Community representatives shared their concerns about persistent inaccuracies and exaggerations in reporting on the threats they face, highlighting the detrimental effects of negative media coverage on their wellbeing and livelihoods.

We found that, although initially there was a certain degree of scepticism and uncertainty from the community around working together, public sector organisations appear to have made substantial efforts to engage residents and are now actively collaborating to bolster resilience against flooding. The Fairbourne Partnership illustrates how sustained, collaborative working between residents and public bodies can build trust. While context-specific, it may offer useful lessons for other coastal communities.

Fairbourne Partnership

Fairbourne is a low-lying coastal village in Gwynedd, facing severe long-term flood risk due to sea-level rise. In 2013, after the area's Shoreline Management Plan determined that defending Fairbourne beyond the mid-21st century would be unsustainable. In response to this, a multi-agency Fairbourne Partnership (formally known as Fairbourne Moving Forward) was established.

This partnership brings together Gwynedd Council, the local Community Council, Natural Resources Wales, Welsh Government, public health and emergency services, and other stakeholders.

Its core purpose is to support the community through the inevitable transition – keeping Fairbourne a safe and viable place to live in the near term while planning for eventual relocation when climate impacts become unmanageable. Fairbourne's situation is unique in the UK, essentially making it a test case for managed retreat; the partnership's work is breaking new ground in navigating the legal, social, and practical challenges of climate adaptation at the community level.

Since its inception, the Fairbourne Partnership has undertaken a range of initiatives to address both physical risks and community wellbeing.



Fairbourne, Gwynedd

On the planning side, it worked with engineering experts to develop a Coastal Adaptation Masterplan (completed in 2018) as a roadmap for the next 30+ years.

The partnership also coordinated practical measures like strengthening sea defences (e.g. the £6.8 million flood scheme that now protects over 400 properties) and drafting a multi-agency Emergency Response Plan.

Equally important have been the community-focused actions. The partnership holds regular public meetings and drop-in sessions to share information and hear concerns. A dedicated website and newsletters (the Fairbourne.info hub) provide updates, helping combat misinformation. It also set up a volunteer Flood Warden scheme and ran a campaign to sign up over 95% household participation in flood alert registrations.

Despite negative comments in the press about Fairbourne's future, the Fairbourne Partnership has made notable progress in both safeguarding the village for now and preparing for the future.



While uncertainty about the long term remains, residents now have active channels to voice concerns and to get support. This has alleviated some of the fear and isolation that people initially felt, and has maintained community morale, an outcome often overlooked but critical for resilience.

The case of Fairbourne stands as a testament to how proactive planning and community partnership can begin to tackle the otherwise daunting reality of climate change at the local level.

During our initial conversations with the residents of Grangetown we heard how, in recent heavy rain, the community had got together to organise working parties to go out into the streets and ensure that the drains were clear. This would help to tackle surface water flooding of homes in the area. This demonstrates that communities do have the capacity to assist; but they need the confidence and sometimes, authority to act.

Experiences in these different communities underline the importance of recognising the varying degrees of engagement and consultation

desired by communities regarding climate adaptation processes. This reinforces our view that a one-size-fits-all approach is inappropriate across Wales, and instead, a nuanced place based approach tailored to individual community needs is essential.

This report and its recommendations have been endorsed by all Commissioners of the National Infrastructure Commission for Wales. No Commissioner has a conflict or declaration of interest with the project delivery or with the recommendations.

Summary of our findings: The issues

The final reports for both of these areas of work are published alongside this report. They provide the detailed evidence base for this report and underpin the recommendations that follow.

NICW invites the Welsh Government and other organisations involved in these sectors to note the contributory project reports and their individual recommendations. However, the formal NICW recommendations are contained in this report.

As part of our work to produce this report, the following issues were identified when synthesising the research reports, as well as our own conversations with interested parties.



Burst banks at the River Dee, Corwen, December 2015

Adaptation vs Mitigation

- That the frameworks and targets for climate mitigation are generally understood. 'Net Zero' being the well-used catchphrase for tackling climate change.
- Media coverage often fails to link extreme weather events to climate change, which risks downplaying the scale of the challenge in the wider public consciousness.
- Publicity campaigns are focussed on the public 'doing their bit' to tackle climate change, rather than giving equal prominence to preparing for climate change effects.

Climate change as an urgent and complex challenge

- The urgency of adapting infrastructure in Wales to a rapidly changing climate which will see increasing frequency and severity of extreme weather events
- A reluctance by the Welsh Government to use the powers it has under the Climate Change Act to require more reporting and consideration of climate change adaptation by public bodies
- The inadequacy of current, and often ageing, infrastructure to withstand future climate conditions and the need for long-term, adaptive planning that accounts for uncertainty and evolving risks.

Fragmented and inconsistent planning

- There is inconsistency in how climate adaptation is integrated into infrastructure planning. Public sector and local authorities often lack capacity, resources, and consistent frameworks.

- Community-level engagement is often piecemeal and insufficiently embedded in statutory planning processes.

Data gaps and planning challenges

- There is inconsistency in the use of climate scenarios and modelling tools (e.g. UKCP09 vs UKCP18) across infrastructure sectors.
- There is a lack of accessible, localised, citizen-facing data to support community understanding and engagement.
- Difficulty in translating complex data into actionable insights for both planners and the public is hampering progress.

Funding and financing barriers

- Short-term funding cycles hinder long-term infrastructure investment.
- There is a lack of dedicated, secure funding streams for climate adaptation with an associated difficulty in articulating the long-term economic value of resilience and the wider co-benefits of adaptation, which makes attracting investment harder.



Wildfire on Llangynidr Moors, North Wales

Weak coordination and integration

- There is evidence of siloed working across sectors and between public/private actors which limits mechanisms for sharing data, aligning priorities, or managing cascading risks.
- There is no single governance framework to drive integrated planning across sectors, leaving responsibilities fragmented.

Community engagement and inclusion

- Engagement is often fragmented, under-resourced, and fails to influence decisions.
- Communities – especially underrepresented groups – must be central to climate adaptation planning. Participatory and co-design methods can empower communities to engage more meaningfully in adaptation decisions.

Policy and regulatory misalignment

- Policies across UK, Welsh, and local levels are often misaligned or contradictory.
- Adaptation is under-emphasised compared to mitigation (net zero).
- Planning systems are slow to adapt and lack clarity on responsibilities.

Skills

- Climate knowledge and skills within different organisations varies with some professionals not having the confidence to raise climate issues.
- A lack of use of futures methodologies in both policy making and engagement.

NICW recommendations

A Climate Adaptation Framework

1. In the next Senedd term, the Welsh Government should introduce a Climate Adaptation Bill. This should establish legally binding targets for climate adaptation and create a framework for action and change. It should contain a high-level commitment to halting and reversing biodiversity loss through adaptation.

The Bill should include statutory requirements which:

- Develop a National Adaptation Policy Statement for Wales.
- Mandate climate adaptation strategies and aligned policies for public bodies.
- Require local authorities to create climate adaptation teams with resources and influence to implement policies and strategies.
- Require public infrastructure providers to publish climate change systemic risk and adaptation plans by collaborating with relevant public bodies.
- Require all public bodies and infrastructure providers to use common climate data and projections, and to share this information openly. Implementation should build on existing reporting frameworks to avoid unnecessary duplication.
- Require public bodies and infrastructure providers to prioritise nature-based interventions in their strategies.

2. The Welsh Government should establish a National Infrastructure Resilience Unit to address the unclear ownership of the systemic risks of climate change. This should be accompanied by the creation of a Welsh Climate Adaptation Liaison Forum which brings together local authorities, public bodies and infrastructure providers.

NICW believes that climate adaptation should have the same legal standing as climate mitigation and that a Climate Adaptation Act for Wales will enable it to take legal ownership of climate adaptation in Wales and put the necessary measures in place to highlight the issues and take action. This occurred in relation

to carbon reduction in the Environment (Wales) Act 2016 and we believe it should happen with climate adaptation. Climate adaptation receives less focus due to a lack of targets to drive a clear framework to track progress.

We believe that the current framework dealing with climate risks and events should be unified under one work programme. This can only be achieved through new primary legislation, which should be enacted early in the next Senedd term.

To match the urgency of the climate crisis, legally binding adaptation targets and duties are needed. Unlike climate mitigation, which has clear legal carbon budgets and targets, adaptation efforts lack a comparable statutory framework. This leads to uneven action and accountability.

An Adaptation bill would establish such a framework and signal that preparing for climate impacts is as important and urgent as reducing emissions. It would put adaptation on par with mitigation in our legal and policy systems. Primary legislation would "lock in" responsibility and overcome what observers have called a lost decade of slower progress on adaptation compared to decarbonisation.

The UK Climate Change Committee notes that current policies have "not consistently enabled sector-wide, large-scale adaptation actions", a gap that legislation could help to close (Arup Report, Page 10). By establishing duties and oversight for adaptation, the bill will ensure that every part of the government and public sector plans for long-term resilience.

The bill would require Welsh ministers to adopt a comprehensive, statutory climate adaptation strategy for Wales. This strategy would provide a unifying vision, clear objectives, and measurable targets for resilience, much like the carbon budget system does for emissions. Currently, there is no single plan to align efforts. Our analysis found that the lack of a shared vision and aligned policies hinders progress on adaptation.

A legal mandate for a national strategy would mean that all sectors would plan together under common goals rather than in policy or sector silos. It would create top-level accountability. Ministers

would report to the Senedd on adaptation outcomes as they currently do for emissions. Crucially, it ensures long-term continuity. An adaptation strategy would plan 30 to 80 years ahead, in line with climate risk timelines, and would bind current and future governments to a course of action. This would allow it to survive short-term political cycles. This would address the leadership gap identified by NICW and others, establishing that adaptation is an essential part of governance.

The next UK-wide Climate Change Risk Assessment (UK CCRA4) is scheduled for 2026 and will include specific recommendations for Wales. This update will offer an enhanced evidence base on the most significant risks, requiring a strategic approach to cascade the management of these risks effectively down to the local level.

We have [previously called](#) for the Well-Being of Future Generations Act to be bolstered to enable public bodies to effectively plan to increase infrastructure resilience over a longer time frame. Our proposed law would require each public body (a starting point would be those bodies listed to act under the Well-being of Future Generations Act) to produce a climate adaptation plan. Currently, many local authorities and public bodies have only fragmentary or reactive plans in place, and their practices are inconsistent. Our research has found that, while improving, the public sector's understanding of climate risks is still "relatively immature." (Arup Report, Page 10).

Some at-risk communities have no long-term adaptation plan, making them highly vulnerable. Making local adaptation planning a statutory duty guarantees that every community will assess its specific risks (e.g., flooding, heat waves, and drought) and set out actions to address them. While local plans would likely align with the national strategy, they would also be tailored to local needs and could be linked to existing requirements, such as Local Development Plans and emergency

management plans. The Act would also establish a reporting framework to track and evaluate progress on local adaptation.

Our proposed bill would require each local authority (and potentially other public bodies) to designate a lead officer or team for climate adaptation. Currently, adaptation responsibilities are often diffuse, and it is not always clear who is responsible for this area. Our research on infrastructure resilience and our conversations with affected communities have noted a "lack of clear leadership and roles and responsibilities" for managing climate risks at the local level (Arup Report, Page 11).

The law would establish a statutory role to ensure every authority has a senior officer responsible for adaptation, who is accountable for advancing the agenda. These officers will coordinate work across departments, including housing, highways, drainage, planning, and other services, to implement resilience measures. They would also collaborate with communities and businesses, serving as local experts. This builds capacity because involving communities in adaptation and implementing innovative solutions requires dedicated skills and

time, as evidenced by our work in Grangetown. Over time, this network of officers could share best practices, perhaps with the support of the proposed Climate Hub (see Recommendation 9), and ensure consistent progress across Wales.

Our proposed new law would oblige major infrastructure owners and operators to regularly assess climate risks to their networks and assets, and to explain how they will manage these risks. Critically, these assessments must include interdependencies and cascading risks. Currently, no single entity is held accountable for risks spanning sectors, and responsibility for ownership of cascading, interdependent climate risk remains unclear.

Because each organisation tends to focus on its own assets, cross-sector vulnerabilities can be overlooked. Under the Adaptation Bill, however, each regulated infrastructure provider would be legally required to consider the effects of extreme weather on their service and how it could affect others, and vice versa. They would submit Climate Resilience Plans to regulators or the Welsh Government, demonstrating how they would maintain continuity under future climate scenarios. These would be prepared in collaboration with infrastructure providers.



Dried up reservoir during heatwave, Liwyn Onn

This will also foster greater information sharing between sectors, since infrastructure organisations will need data from each other to effectively perform these assessments. Overall, this provision ensures that systemic risks are actively managed and that all infrastructure providers and operators consider climatic threats to the services on which we all rely.

To support this, the bill would task the Welsh government (or a designated scientific body) with establishing uniform technical standards for climate risk information. Currently, different organisations use different climate scenarios, timelines, and datasets in their planning, which leads to inconsistency. Our analysis revealed a "disjointed approach across sectors" in accounting for future climate, with organisations using different assumptions, which "creates a disparity in the understanding of future climate risk." (Arup Report, Page 11)

These misalignments can undermine each other's efforts. Under the Adaptation Bill, Welsh Ministers would establish official guidance on climate projections (based on UK Climate Projections and the latest scientific research) and require that all risk assessments and plans adhere to this guidance.

In essence, all relevant organisations would be planning for a shared, anticipated climate future in Wales. This improves efficiency and consistency. It also ensures that investments are future-proofed.

During a recent study tour of north Wales, we found that determining who is responsible for infrastructure vulnerability to climate change impacts can be difficult. The recent storm damage to the port infrastructure in Holyhead had a significant economic and logistical impact on the region and beyond. It is unclear who is responsible for identifying and addressing these types of risks. Who is responsible for ensuring that a plan is in place? This is particularly the case when private businesses are responsible for nationally important assets.

The establishment of an Infrastructure Resilience Unit would address the current leadership gap within the government and champion adaptation across sectors, promoting holistic and interdependent thinking within the Welsh government. One element of this unit's ethos will be to encourage emergency planning and resilience work at the local level, through Local Resilience Fora, to move beyond crisis management to longer term planning.

Our research revealed that ownership of cross-sector climate risks is unclear, and collaboration must improve. A dedicated unit backed by a forum would promote a comprehensive approach and be a driving force behind our proposed bill, ensuring that all critical risks are considered.

A Climate Adaptation Bill would transform Wales' approach to climate risks. It establishes an overarching duty to act on adaptation now, not later. By requiring a national strategy, local plans, dedicated leadership, cross-sector risk management, and unified data, the bill would address the key barriers identified by our research and others.

The outcome would be a significant improvement in our preparedness. Just as Welsh legislation has driven progress in reducing carbon emissions, this law will drive progress in building resilience. Wales would be one of the first countries to give adaptation such legal prominence, demonstrating leadership and foresight. Most importantly, it would better protect our communities, economy, and environment from unavoidable climate change impacts.

A Welsh Climate Adaptation Liaison Forum is also proposed, similar to the Scottish model (highlighted below) which brings together public bodies and infrastructure providers to discuss issues, share knowledge and coordinate work programmes.

Climate Ready Infrastructure Scotland Forum

The Climate Ready Infrastructure Scotland Forum is a collaborative initiative launched in May 2025 to strengthen infrastructure resilience in Scotland amid accelerating climate change. It emerged from the recognition that Scotland's infrastructure networks are interconnected systems where climate impacts can cascade across sectors.

The Forum was co-founded by three major national operators – Network Rail Scotland, Scottish Water, and SP Energy Networks – with support from the Scottish Government's Adaptation Scotland programme. More than 20 organisations (public and private) came together as founding members, signing a Memorandum of Understanding to work jointly on climate adaptation.

This coalition includes national agencies like Transport Scotland, utilities (electric, gas, water companies), transport providers (rail, canal and road authorities), environmental bodies, and academic institutions. The broad membership underlines the Forum's core premise that no single organisation can tackle climate resilience alone.

By pooling expertise and coordinating strategies, the Forum aims to ensure that Scotland's infrastructure is prepared for the more extreme weather and rising seas projected in the coming decades.

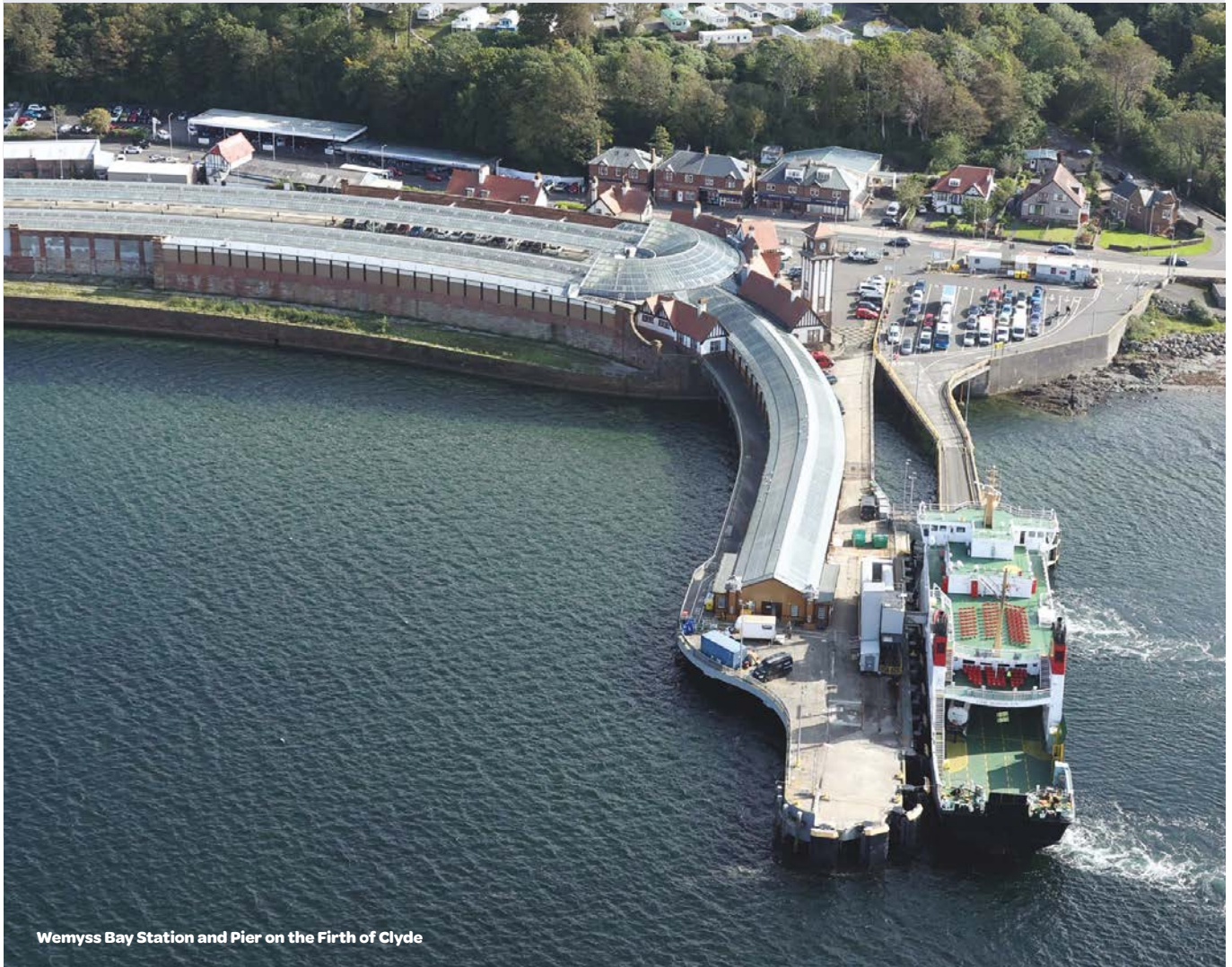
Since its formation, the Climate Ready Infrastructure Scotland Forum has focused on breaking down silos and promoting joint action among infrastructure operators. A first step was establishing agreed priorities through the Memorandum of Understanding. Under this agreement, members are sharing knowledge, data, and best practices on climate risk management.

The Forum members have committed to coordinate their climate risk assessments so that interdependencies are identified and addressed collaboratively. This might involve co-commissioning studies or maps of cross-sector vulnerabilities (for instance, locations where a power substation, railway line and highway are all exposed to the same floodplain).



Although still in its infancy, the Climate Ready Infrastructure Scotland Forum has already had a significant impact on how climate adaptation is approached in Scotland. Most tangibly, it created a formal network where none existed,

bringing together infrastructure providers under a common resilience mission. Critical sectors are now regularly talking to each other about climate solutions.



Wemyss Bay Station and Pier on the Firth of Clyde



Rolling out effective engagement across Wales

3. In implementing all these recommendations, early, inclusive and participatory engagement should be undertaken with all communities on climate adaptation strategies and plans. Methods should be tailored to each community following good practice from NICW and elsewhere.
 4. By 2028, the Welsh Government should create the position of Chief Participation Officer. This role would lead efforts across government to improve how citizens are involved in decisions; including, but not limited to, climate change and infrastructure. They should work across Welsh Government, local authorities, public bodies and infrastructure providers to embed good practice, ensure coordinated 'place based' engagement to guard against engagement fatigue.
-

Climate decisions will be fairer and more effective if the public is involved from the beginning. Our work in Grangetown and our conversations with people affected by climate change across Wales have led us to conclude that this is a conversation that should involve everyone. "Many communities currently feel unheard or disempowered." (SOIF Report, page 10)

Policies developed with communities (not just for them) reflect local needs and values, making people more likely to support and adopt them. Early, participatory engagement in adaptation planning builds public understanding and support.

Our work has shown that, given the right methods, everyone, including underrepresented groups, "can engage in complex and deep conversations about the future". (SOIF Report, Page 31).

Failing to engage widely could reinforce inequalities, as those already vulnerable to climate impacts might be overlooked in plans. Inclusive engagement, on the other hand, links to existing community expertise (such as local knowledge of flood history) and improves trust in decisions.

Uncertainty and technical complexity are not insurmountable obstacles. We have demonstrated that diverse groups can understand these issues and propose solutions. Recommendation 1 suggests embedding early, inclusive public engagement into adaptation strategies, will lead to more equitable, community-supported outcomes and avoid the pitfall of top-down decisions that might fail in practice.

Pembrokeshire Coastal Forum Climate Adaptation Toolkit

In Pembrokeshire, a Climate Adaptation Toolkit has been launched to help communities prepare for the impacts of climate change.

The [Toolkit](#), developed by the Pembrokeshire Coastal Forum, brings together practical resources to help communities understand the risks they face, from coastal flooding to increased risk of wildfire, and to help communities work with key stakeholders to co-create their own local adaptation plans. It includes free-to-access guides, templates, a network for action, and mapping tools designed to support place-based, community-led climate action.

In a pilot project starting in early 2025, Saundersfoot became the first community to trial the toolkit. Stakeholders including residents, local businesses, landowners, Natural Resources Wales, The Crown Estate, Mid and West Wales Fire and Rescue Service, Pembrokeshire National Park Authority, Saundersfoot Harbour Authority and Pembrokeshire County Council came together to assess flood risks, share knowledge, and begin co-creating a local climate adaptation strategy. This collaborative process has already begun to influence how local partners work together.



The Welsh Government's own risk assessments highlight flooding, coastal erosion, and loss of infrastructure as growing threats. In response, the Pembrokeshire Coastal Forum's toolkit provides a scalable model that empowers communities to shape their own responses – while aligning with national policies like the Well-being of Future Generations Act and the Climate Adaptation Strategy for Wales launched in 2024, it said.



Wales Coastal Path, near Newgale Beach, Pembrokeshire

The toolkit is organised into four sections:

- Learning Hub – Insight into local climate risks and how to talk about them
- Community Action – Step-by-step guides and tools to help communities plan adaptation measures
- Network for Action – Links to organisations, funding routes, and support networks
- Resources – Downloadable templates, maps, and facilitation materials

The aim is to make climate adaptation accessible for anyone who wants to help prepare their community for the future.

With positive feedback from the Saundersfoot pilot, there are plans to expand the rollout to more areas.

However, strong engagement requires leadership and resources. Many public bodies struggle to engage communities on climate matters because they lack the resources, capacity, and skills to support community engagement.

Creating a Chief Participation Officer role would provide clear, strategic leadership to embed high-quality engagement across government. This role would oversee coordination, support departments with tools and insights, and help break down barriers between silos. By prioritising and professionalising participation, the Welsh

Government can enhance how it collaborates with citizens on major policy decisions. While climate adaptation would be a key priority, the role would contribute to a broader mission of inclusive policymaking and democratic renewal.

This recommendation elevates engagement as a professional and strategic function. The role would influence a wide range of public policy, not just climate. By investing in dedicated capacity, the Welsh Government can improve the way it listens to and works with the public, resulting in more informed and democratic policymaking.

NICW work in Grangetown

As part of our research for this project we launched an innovative engagement project in focused on the diverse urban community of Grangetown in Cardiff. Grangetown, home to about 20,000 people, is known for its multi-ethnic population and strong community spirit, making it an ideal place to pilot new ways of discussing climate adaptation and infrastructure at the grassroots level.

The goal of our work was to learn how to spark meaningful conversations about preparing for climate impacts in a local context, and to ensure that the community's ideas, concerns, and hopes inform NICW's strategic advice. In partnership with the School of International Futures (SOIF) we set out to co-create engagement activities with Grangetown residents rather than for them.



In the initial phase, SOIF worked closely with three local partner organisations to scope the community's context and co-design the process. Instead of using a one-size-fits-all template, the activities were tailored through numerous conversations with community leaders. This meant understanding where people in Grangetown already gather, which

issues they care about, and how best to spark their interest. Once trust and ideas for engagement had been built collaboratively, the project moved into its action phase.



SOIF and the community partners rolled out three pilot workshops with each community organisation, to talk about climate adaptation and infrastructure in creative, accessible ways. A golden thread throughout these sessions was the use of participatory futures techniques.

For example, in one workshop residents took an imaginary "walk" through their neighborhood 30 years in the future, stopping to envision how a spot like the local park or high street might look in 2050 after decades of climate change, and brainstorming what adaptations or infrastructure changes could help or hinder that future. In another, participants engaged in a role-play game where they assumed the identities of future citizens, planners, or business owners, grappling with a scenario (like a major flood) and debating responses.

Throughout, the emphasis was on quality of conversation over quantity of people: rather than a large public meeting, each pilot session

involved a small group (often 10–15 attendees) in an intimate setting, enabling deeper discussion and ensuring quieter voices were heard. After the three pilot workshops, the local partners, SOIF and NICW came together for a synthesis session to share what they observed and learned from each community engagement. They distilled common themes, surprising ideas, and points of divergence. This internal reflection was vital in shaping the outcomes and recommendations that would follow.



Finally, to end the project, NICW were honoured to be invited to join a Youth Forum's Iftar in late March 2025. At this event, residents who had participated in the pilot sessions brought along friends and family to break the fast, share food, and then discuss the project's findings in a relaxed, community atmosphere. Displaying posters summarising each workshop's future scenarios and ideas, the team invited feedback and further storytelling from attendees.

The event also culminated with the premiere of a [video](#), produced by the community which gave more insight into the project and to engage others.

The Iftar event served multiple purposes – it was a way to “give back” to the community by sharing results openly (not just in a report), to thank participants for their time and insights, and to spark wider interest by engaging people who weren’t part of the initial workshops. The choice of a cultural setting for the final event paid off: many who came for the food and socializing stayed to talk about flood defenses or green energy in Grangetown’s future, illustrating how unconventional outreach can pull new voices into the conversation.

Together, all these initiatives – from the co-design meetings to the pilots and the final celebration – formed a rich tapestry of engagement. They provided NICW with a ground-level view of climate adaptation challenges and ideas in Grangetown, while empowering community members to think about and discuss their future in a way few had done before.

NICW is continuing to work with the three community groups throughout 2025/2026 to enable this work to be continued and for this work to live on through other projects. All the time, working with the groups to develop ideas and suggestions.



Improving the Planning System

5. Within the next Senedd period, the Planning Acts should be amended to require the production of statutory guidance requiring meaningful community engagement at all stages of the planning system. This should cover infrastructure decisions, planning applications and the development plan processes.
6. By 2028, the Welsh Government should review Planning Policy Wales to ensure that climate adaptation is addressed throughout the document and in relation to every type of new development.

In addition, there should also be a new Technical Advice Note on Climate Adaptation, which provides strategic and detailed technical advice on development planning and individual development design.

7. By 2028, secondary legislation and guidance should be amended to include the need for climate adaptation specifically to be part of the Environmental Impact Assessment (EIA) and Strategic Environment Assessment (SEA) processes. This will ensure climate adaptation is woven into the core of strategic decision making and the impacts assessed at an early stage. Training should be provided to those operating within these systems to highlight the need for focus on climate adaptation.

Making public engagement a statutory requirement will raise the bar for all planning processes. Currently, the timing and manner of community consultation on infrastructure projects or development plans is inconsistent. NICW have previously called for this in [consultation responses](#) to Welsh Government.

Embedding engagement expectations in legislation (similar to the [Active Travel Act's](#) approach) means those taking decisions "must have regard" to official guidance and report on how they involved the public, ensuring accountability. This recommendation will ensure we move from voluntary good practice to a uniform high standard.

Our research has highlighted that conversations about climate adaptation and infrastructure need to form part of our core democratic processes,

rather than being an afterthought. Indeed, the SOIF report urges the Welsh Government "to ensure that climate adaptation and infrastructure conversations are part of its wider activity to strengthen citizen involvement in democratic debate" (SOIF Report, Page 41).



Statutory guidance could operationalise this principle through the planning system. This could entail specifying methods, requiring engagement with diverse groups and mandating transparency through participation statements, which would then be subject to scrutiny prior to decision-making.

We believe this would result in better decisions and increased public trust. When communities are genuinely involved in infrastructure decisions, the outcomes are more robust and legitimate. This guidance would make meaningful engagement standard practice, providing consistency across Wales and preventing public disengagement and disenfranchisement when major infrastructure projects are considered/consented.

Alongside this, the planning framework in Wales needs to be reviewed to ensure that climate change adaptation is a core consideration in all development. While Planning Policy Wales (PPW) currently acknowledges climate change, NICW's analysis suggests that the coverage of adaptation is inconsistent and lacks the specificity required for practical implementation. Just as placemaking was amended in edition 10 of PPW in 2018, climate adaptation requires thorough consideration throughout the document.

All types of development will be affected by future climate impacts, such as heat, flooding and drought, yet planners lack detailed guidance on how to factor these into their decisions. A comprehensive review of the PPW would identify where policies should be amended or strengthened to ensure that climate resilience is addressed throughout the document in relation to every type of new development.

Specifically, this could result in new requirements, such as climate risk assessments for major projects or design principles for resilient buildings and green infrastructure.

Additionally, the publication of a dedicated Technical Advice Note (TAN) on climate adaptation would

provide planners and developers with the technical details and examples needed to implement policy. Without clear policy, adaptation can be overlooked. By integrating adaptation into the PPW and its associated guidance, the Welsh Government can ensure that every planning decision made today will contribute to making the nation climate-ready in the future rather than locking in new vulnerabilities.

One specific way in which climate adaptation efforts can be systematically assessed is through Environmental Impact Assessments (EIAs) and Strategic Environmental Assessments (SEAs). Currently, these processes tend to prioritise mitigation over adaptation. Consequently, decisions may be made without fully considering long-term resilience.

Our research noted a general 'lack of focus on adaptation in the policy environment' (Arup Report, Page 23) with climate policy often equated with simply reducing carbon emissions. Explicitly requiring climate adaptation to be addressed in EIAs/SEAs would 'weave adaptation into the core of strategic decision-making', ensuring that plans and projects are assessed for future climate risks early on. Currently, whether or not adaptation is considered can depend on the judgement of individual assessors or consent authorities, so this consistency is important. Mandating it via regulation removes that uncertainty. Training professionals who are using these regulations everyday will also help to raise the prominence of climate adaptation in major development proposals.

As discussed below, giving climate adaptation its own identity, separate from 'climate change' or 'environment' generalisms, will help to raise the profile of the issues at hand, providing dedicated advice, policy and guidance, and, importantly, action.

This change is needed to emphasise the principle that every major policy, programme, plan or project should be viable in a changing climate.

Infrastructure project assessment

8. The UK Government should amend (and the Welsh Government should advocate for) the 'Green Book' to give equal weighting to climate adaptation when assessing new infrastructure projects for Government funding.

NICW has [previously highlighted](#) that under current appraisal guidance, climate adaptation measures can be systematically undervalued, hindering funding for resilience. No environmental value is attributed to the schemes. For example, tidal lagoons are not recognised in the current business case process for providing flood protection to large areas of land, but just for their renewable energy capacity.

The HM Treasury Green Book sets out the rules for evaluating public investments across the UK. It tends to favour projects with immediate economic returns. Adaptation projects, such as flood defences, urban cooling and infrastructure retrofits, often deliver benefits over decades and prevent far greater future losses. However, those avoided damages and long-term gains may not score highly in traditional cost-benefit analysis.

Our research shows that it is difficult to articulate the tangible value of resilience and adaptation measures in current frameworks. This can result in adaptation options being overlooked because their full value is not reflected in the business case. In reality, the costs of inaction on adaptation are likely to be very high: 'the cost of responding to damage caused by climate change is likely to be many times higher than the cost of preventative measures' (Climate Adaptation Strategy for Wales).

[Research](#) suggests there is strong long term economic case for investing in climate adaptation.

Therefore, it is crucial to update the Green Book to give equal weighting to climate adaptation considerations. This would encourage economists and decision-makers to consider benefits such as risk reduction, future cost avoidance and improved social resilience, as well as traditional metrics. By advocating this change, Wales (through the Welsh Government lobbying the UK Government) will help to secure funding for essential adaptation projects that currently struggle to overcome Treasury obstacles. In short, this recommendation ensures that the economic case for resilience is fully recognised, enabling smarter, more future-proof spending decisions to be made.



Conwy Valley with Llanrwst in the foreground looking north

A Climate Futures Hub

9. In the next Senedd term, the Welsh Government should establish a “Climate Futures Hub” as a centre of excellence and support for engaging communities in long-term infrastructure and climate adaptation planning.

This hub would:

- create a well-design, accessible resource for the public to get involved in climate adaptation
- develop a shared national engagement charter for climate adaptation
- establish a community of good practice for climate adaptation across Wales
- support the creation of regional technical hubs or resource pools
- promote skills and provide training and accreditation for climate adaptation
- incorporate a dedicated strand of work focused on nature adaptation futures.

Our study in Grangetown concluded that 'Wales needs a central resource to continue the creative and structured approaches that enable meaningful, long-term conversations about infrastructure and climate adaptation'. (SOIF Report, Page 44)

Without a dedicated hub, perhaps coordinated by the proposed Chief Climate Engagement Officer (see Recommendation 4) the innovative methods of community engagement developed during the pilot could remain isolated. A Climate Futures Hub would ensure that these methods are sustained and spread. It would facilitate ongoing public discussions about infrastructure resilience rather than one-off exercises. Crucially, this would enable future projects to build on past lessons and avoid duplication of effort. A hub would enable communities and infrastructure planners to 'connect, share and learn' from each

other's climate adaptation experiences, creating a virtuous cycle of improvement. In order to achieve this connection, a dedicated resource will need to be provided that gives access to the public in an accessible way. This would give communities/individuals the information they need and would signpost to other sources of action or who to contact to find out more.

Our research into infrastructure bodies revealed that climate planning often occurs in isolation, with an 'absence of dialogue' even between key sectors (Arup Report, Page 17). This implies not only that communities are separated from decision-making, but also that professionals are not consistently sharing knowledge across domains.

The Climate Futures Hub directly addresses this issue by serving as a cross-cutting platform for collaboration. It would break down these silos by bringing together interested parties from various sectors and the public. It would institutionalise a 'whole-system' approach to learning and engagement on climate issues, creating a central location where insights from a flood defence project in one region could inform a transport plan in another, or where a community's successful grassroots initiative could inspire others nationwide. By establishing a permanent centre for futures thinking, Wales can ensure that its adaptation planning is inclusive, forward-looking and continuously improving, and is thus aligned with NICW's vision for proactive climate resilience.

One of the Hub's initial tasks should be to bring together interested parties, including government, local authorities, utilities and community

representatives, to agree on a public engagement charter for climate adaptation. This charter would set out common standards, such as commitments to early involvement, transparency, inclusivity and providing feedback on any climate-related infrastructure project.

Obtaining cross-sector and community support would create accountability and consistency. Communities across Wales can then expect the same high-quality engagement from any project.



The charter also signals a cultural shift, making it clear that public participation is a core part of infrastructure planning, not an optional extra. A charter helps to embed this in organisational DNA.

Local connections are also important as part of this approach. The Hub could operate on a 'hub-and-spoke' model, with a core team working at a national level and collaborating with local partners across Wales. In practical terms, the Hub could set up regional support teams to assist local authorities or community groups upon request.

Our work in Grangetown has highlighted the effectiveness of community anchor organisations in hosting these discussions. The Hub could strengthen these organisations by providing them with resources and linking them to the wider network. Through providing small grants, signposting to toolkits, on-site coaching or lending

exhibition materials, the Hub could ensure that even the smallest communities can engage meaningfully.

It would also adapt its approach by recognising that what works in one community may need amending in another. The Hub, with its regional insight, can help to adapt methods to fit local culture, language and specific concerns. This on-the-ground support ensures equity, ensuring that rural areas, disadvantaged communities and busy urban wards all receive attention and support in shaping their future. It truly localises the national effort, creating a two-way flow where local innovations and concerns inform national strategy, and vice versa.

Finally, high-quality engagement requires certain skill sets, such as facilitation techniques, futures thinking and an understanding of climate data. Currently, many officials and community leaders may not feel confident in these areas. The Hub could lead training and educational initiatives to address this, potentially partnering with educational institutions to develop certified modules on public engagement in climate adaptation.

On nature adaptation, work could include supporting community-led biodiversity action plans, promoting co-design of green infrastructure with nature benefits and training facilitators in ecosystem-based approaches to resilience.

Another aspect is empowering the public. The Hub could offer 'train-the-trainer' sessions to turn interested residents into facilitators who can lead dialogues in their own neighbourhoods, creating a multiplier effect. Our ongoing work in Grangetown has sought to replicate this approach by building capacity within the community itself.

Over time, these efforts would cultivate a cohort of skilled facilitators, engagement specialists and informed citizen advocates across Wales.

UK MACC Hub – Maximising adaptation to climate change

The **Maximising UK Adaptation to Climate Change (MACC) Hub**, was launched in 2024 to coordinate and accelerate adaptation efforts nationwide. Backed by a £5 million investment from UK Research & Innovation and Defra, the MACC Hub brings together experts and organisations from all four UK nations under a single programme.

The hub's core mission is to inform and support professionals working to implement the UK national adaptation plan by overcoming current barriers – such as low public awareness, fragmented policies, and gaps in data – that hinder the UK's ability to adapt effectively. The MACC Hub emphasises “transformational adaptation”, insisting that efforts to protect society from climate change should also improve resilience for the most vulnerable and drive positive social change.

The MACC Hub is a UK-wide partnership designed to drive a step-change in climate adaptation practices through collaborative research, policy engagement, and on-the-ground action. It unites academic researchers, government agencies, NGOs, and community organisations in an effort to break down silos and coordinate adaptation initiatives that have traditionally been fragmented.

The hub seeks to create the enabling conditions for “transformative” adaptation – changes that not only manage climate risks but also address underlying vulnerabilities and injustices. The hub's strategy for achieving this is centered on four key objectives, which guide all its activities.

To turn these objectives into reality, the MACC Hub is structured as a network of regional and thematic teams, each tackling a specific barrier to adaptation. The Oxford centre of the Stockholm Environment Institute (SEI) hosts the hub's online knowledge portal, linked to the global weADAPT platform, to disseminate findings and tools widely.

Such an organisational design, with regional centres of excellence and a unifying secretariat at King's College London, allows the MACC Hub to coordinate nationally while adapting solutions to local contexts. Effective coordination means that, for instance, a new flood resilience toolkit developed in one region can be rapidly shared and adapted for use in another via the hub's network. At the same time, local knowledge flows upward: insights from community-level projects and practitioners are captured through the hub and channelled into national policy.

This two-way knowledge flow is key to the hub's theory of change: by linking grassroots adaptation innovations with high-level strategy, the UK can develop a climate adaptation approach that is both bottom-up and top-down, combining practical experience with strategic vision.





Talybont Reservoir, Bannau Brycheiniog

Funding

10. We repeat our recommendation from our 2024 Flooding report for a new cross-sector climate change adaptation and resilience fund. This fund should be underpinned by a Welsh Climate Adaptation Investment Framework and will be used to invest in projects identified in the national and local adaptation plans and strategies. This will require cross-Government coordination and should be administered by the National Infrastructure Resilience Unit.

The mechanisms to finance and deliver climate change adaptation remain fragmented, short-term, and underpowered. To meet the scale of the challenge, Wales must adopt a bold and integrated approach to climate adaptation funding – one that aligns ambition with delivery, and vision with investment.

Last year in our [Flooding Report](#), we recommended an enhanced review of climate adaptation funding. We now see that the creation of a Welsh Climate Adaptation Investment Framework should be developed to deliver this funding. Such a framework could be used as a strategic funding model that brings together adaptive investment pathways, monetised co-benefits, and cross-sectoral coordination under a single umbrella.

This framework would enable Wales to plan long-term within short-term funding cycles, build compelling business cases for resilience, and unlock both public and private investment.

The framework could include:

- Community Engagement Funds, to help enhance community resilience and move to 'place based' engagement, co-ordinating infrastructure providers
- Adaptive Investment Pathways which could provide flexible, staged roadmaps that allow infrastructure and resilience programmes to evolve as funding becomes available
- Co-Benefit Valuation so that we systematically include wellbeing, biodiversity, and avoided-loss benefits in economic appraisals
- Cross-Sectoral Coordination to fund boards and shared outcomes frameworks that align priorities across infrastructure and environmental sectors



Cardiff Bay Barrage

- Project Preparation Support to provide technical assistance to help public bodies develop bankable adaptation proposals.

Our research highlighted the need for structured, long-term planning infrastructure and community engagement mechanisms. It also concluded that disjointed governance, weak economic cases, and siloed funding streams are key barriers to adaptation.

By establishing this framework, which could be coordinated and administered by the proposed National Infrastructure Resilience Unit (see Recommendation 2) we can provide clarity and confidence to investors and delivery partners; maximise public value through coordinated,

place-based; investment; scale successful pilots and community-led initiatives and track progress and impact across sectors through transparent governance.

This approach does not require wholesale reform of public funding cycles. Instead, it works within existing constraints to deliver long-term resilience, making Wales a leader in climate adaptation finance. However, cross-Government coordination of this work is needed. We believe that the proposed National Infrastructure Resilience Unit is charged with co-ordinating this investment to help drive forward the joined-up thinking that is needed to ensure the maximum benefits are realised from climate adaptation work.



Nantgarw, after Storm Dennis, 2020

Data

11. Within the Climate Futures Hub, or separately, the Welsh Government should provide, or otherwise facilitate platforms for:

- a Welsh climate data and intelligence body (see recommendation 1)
 - a well-designed open-access climate intelligence platform which is accessible for communities to use themselves
 - regional climate data commons for professionals to share experiences, network and discuss issues.
-

In order to provide the public and professionals with accessible and reliable information on climate risks and adaptation solutions, there needs to be better data sharing and transparency to improve decision-making and trust.

Our research has revealed several information gaps, such as communities struggling to find local climate impact data and technical data not being shared effectively between organisations. Citizens often find it difficult to access information on future climate risks at the local level, and the absence of reliable data can lead to misinformation, which is a dangerous situation that can result in misunderstanding or apathy.

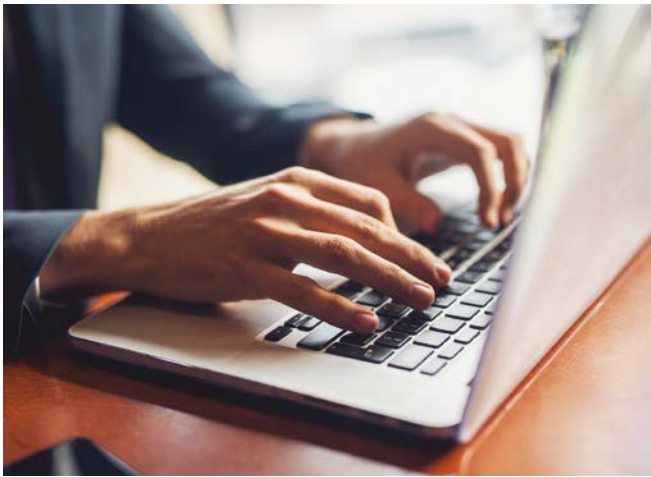
We found that infrastructure organisations take a disjointed approach to using climate projections and share limited data across sectors, which leads to fragmented analyses. Wales lacks a centralised way to gather climate intelligence and disseminate it in a user-friendly manner to those who need it. By establishing dedicated platforms as sub-components of the Climate Futures Hub or as separate initiatives, we can greatly enhance the evidence base for adaptation and the public's ability to engage with it.

A Welsh Climate Data and Intelligence Body would be a central team or digital portal responsible for collecting, analysing, and publishing climate risk data for Wales.

Our research reports have noted that, although Wales has robust climate science, the data is scattered and not always in a format that is usable by planners. Open, accessible information and consistent approaches are needed to drive cohesive action. A dedicated data body could establish common datasets and scenario assumptions for everyone to use, supporting the push for standardisation in the Adaptation Bill (see recommendation 1). The body could produce climate risk maps, data visualisations and sector-specific analyses (e.g. heatwave risk to schools and flood risk to transport networks) that planners and policymakers could easily integrate into their work.

The data body should also include localised data on ecosystem sensitivity and climate vulnerability and provide tools to help communities understand and monitor nature-based solutions (eg biodiversity mapping, tree canopy coverage, peatland condition indicators).

Crucially, it could broker 'trusted and secure data-sharing agreements' between institutions, enabling infrastructure operators to share vulnerability data with the government safely (Arup Report, Page 26). By centralising this function, we would avoid duplication and ensure that all organisations operate with the best available evidence, thereby improving efficiency and consistency. In essence, this body would become the 'one-stop shop' for climate risk intelligence in Wales, greatly simplifying the current confusing landscape of disparate data.



In addition to a technical data portal, a user-friendly, public-facing website or tool is needed to inform and empower communities. This platform would translate the data into formats and language suited to the general public and community groups. For example, it could feature an interactive map on which residents could click on their town to see future climate projections, such as flood extents and temperature rises, and read about adaptation measures that are being or could be implemented. Our engagement work revealed a desire for local evidence – people wanted to know, 'what will climate change mean here?' – however, such information was often absent or overly technical.

By providing trustworthy, clearly explained local climate information, the platform would pre-empt misinformation and enable citizens to engage in informed debate. The platform could also host inspiring stories and case studies (e.g. how one community built flood defences) to encourage action by blending data with human context.

Finally, a collaborative digital workspace should be established where professionals and practitioners across Wales can share data, models and insights on climate adaptation projects. This would help address the current perceived silos between organisations.

Our research noted that infrastructure sectors often do not share data, with organisations stating that it is difficult to know what data is available from others regarding climate risks. A 'data commons', for example, a secure cloud repository or hub where different bodies contribute data and case studies, would encourage a culture of openness. Planners, engineers, academics, and others could upload datasets, report findings from pilot projects, or pose questions to their peers.

Regular meetings or an online forum, moderated by the central data body, could complement this. Through shared information, we can use our collective knowledge much more effectively by 'planning together and acting together'. Moreover, common challenges could be tackled jointly, fostering collaboration.

Cross border issues

12. The Welsh Government should advocate for greater inter-government coordination and representation across the UK on infrastructure resilience. This should be at a Ministerial level and could be part of the British-Irish Council frameworks or other mechanisms, to push for parity of climate adaptation with mitigation.

Climate risks don't recognise administrative boundaries, and our response shouldn't either. Wales is intrinsically linked to the rest of the UK via vital infrastructure systems like energy grids, transport lines, and river catchments, as well as complex supply chains. This means that the resilience of one region can often depend on actions taken elsewhere. However, there are currently few formal mechanisms for governments to coordinate their climate adaptation strategies.

This approach leads to inefficiencies and significant gaps in our collective response. By championing stronger intergovernmental coordination, Wales can help foster a more unified, UK-wide approach to adaptation. This involves ensuring that platforms such as the [British-Irish Council's Environment Work Sector](#) and the UK's inter-ministerial climate meetings prioritise adaptation on par with emissions reduction. It could also mean proposing a dedicated Climate Adaptation Joint Taskforce comprising representatives from the various nations and states. Within this taskforce, officials could regularly share risk assessments, harmonise policies (for instance, on infrastructure standards or land-use planning for resilience), and collaborate on crucial cross-border projects.

We need a whole-of-government approach to climate resilience, and this principle must extend to all governments working in concert. Enhanced coordination would offer several advantages. Wales could benefit from innovations developed elsewhere while also showcasing its own best practices on a broader stage, potentially influencing UK-wide policy. Furthermore, working in partnership strengthens Wales's negotiating position. A united front of devolved governments can more effectively pressure the UK Government to address shared concerns, such as securing long-term funding for adaptation or updating non-devolved regulations. Conversely, a lack of coordination risks inconsistency and duplication. Each administration would be left to tackle immense challenges in parallel, missing valuable opportunities to support one another.



Concluding remarks

Climate change is not a far-off threat for Wales; it is here now, testing the resilience of our communities and infrastructure due to wide-ranging impacts from floods, heatwaves, and storms.

Our reports identified urgent and complex challenges: current adaptation planning is too fragmented and inconsistent, vital data and knowledge aren't shared widely enough, and often, community voices just aren't heard. Every organisation involved in infrastructure planning needs to act now to tackle this climate emergency.

The recommendations in this report offer a comprehensive framework for that action. Together, they address the gaps and barriers we've found, paving the way for a more climate-resilient Wales. By laying a strong legal foundation for adaptation and establishing clear leadership and accountability, Wales can make sure climate resilience is central to all decision making – on a par with our net-zero commitments.

We can empower communities through early, inclusive engagement and embed high standards for public involvement across planning and policymaking, making adaptation a democratic, people-centred process.

Reforming planning policy and appraisal systems will integrate climate adaptation into every project and investment, so we're building for the future climate, not the past. By providing essential resources, like a dedicated Climate Futures Hub to build skills and share best practice, and open data platforms to inform both the public and professionals, we can create the practical tools needed for this generational effort.

And finally, Wales can't go it alone: by pushing for stronger cooperation with UK and regional partners, we'll amplify our capabilities and influence. Combined, these measures form an integrated plan to move beyond the current reactive, piecemeal efforts and usher in a new era of proactive, coordinated adaptation.

Implementing this ambitious agenda will demand leadership, investment, and collaboration across all levels of government and society. NICW is genuinely encouraged by the momentum already building, from community groups eager to shape their futures to infrastructure operators recognising the need to work together.

But we need sustained commitment. We're urging the Welsh Government to act swiftly in translating these recommendations into policy, law, and practical action. Similarly, local authorities, agencies, businesses, and community organisations all have a crucial role to play in driving this forward.

The benefits of acting now far outweigh the costs; as evidence to the Commission made clear, the cost of responding to climate change damage is likely to be many times higher than the cost of preventative measures. By investing in resilience now – in better defences, smarter planning, and richer engagement – Wales will save money and hardship in the long run. More importantly, these actions will protect lives, livelihoods, and our natural environment for generations to come.



Fire fighters attending a moorland grass fire, South Wales.

Appendix A: Testing the Recommendations against our Framework

We have qualitatively tested the recommendations against our framework which consists of:

- The Well-being of Future Generations Goals
- The Nature Emergency
- The Climate Emergency
- The Socio-Economic Duty
- Long-term considerations

The Well-being goals within the Well-being of Future Generations Act

We have not carried out an in-depth impact analysis of our recommendations on each of the Well-being Goals, but we note the following contributing factors.

Goal	Assessment
Prosperous Wales	Our recommendations promote a low-carbon, resource-efficient economy by ensuring infrastructure can withstand climate impacts and continue to support growth. For instance, investing in adaptation now is shown to avert much higher future costs from climate damage, which safeguards public finances and productivity. By calling for an adaptation framework in law and changes to project appraisal (e.g. Green Book reform), the report aligns with building a productive and innovative Wales that plans efficiently for long-term prosperity in a changing climate.
Resilient Wales	Our core vision in this report is for Wales to be “a world leader in climate-resilient infrastructure” by 2050. Recommendations like a Climate Adaptation Act, mandatory local adaptation plans, and better planning will strengthen ecological systems and boost overall resilience. By addressing flooding, heatwaves and biodiversity loss in tandem and requiring all sectors to act on climate risks, the report supports a healthy, functioning ecosystem and society that can absorb shocks.
More Equal Wales	The very foundation of our report and research emphasises that climate adaptation must be people-centered and just. It notes that climate change disproportionately affects vulnerable groups, and stresses a just transition that protects those most at risk. Our community engagement proposals aim to bring under-represented voices into infrastructure decisions, enabling people of all backgrounds to shape solutions.

Goal	Assessment
Healthier Wales	<p>The report implicitly promotes public health resilience. It cites rising heat-related hospital admissions and calls for climate-resilient healthcare systems and community support networks, which aligns with maximising well-being. By targeting improvements in flood protection, heat adaptation, and emergency planning, the recommendations help reduce injury, illness, death and mental stress from extreme weather. Engaging citizens in preparedness also fosters healthier behaviors and understanding of climate risks, contributing to a Healthier Wales where communities are safer and more informed.</p>
Wales of Cohesive Communities	<p>Our recommendations strongly support community cohesion by advocating place-based adaptation planning. It highlights that solutions work best when communities are involved (“co-designed”) and when local knowledge is valued. Our report advocates for people to come together around climate issues. This collaborative approach helps make communities more attractive, viable and safe. By improving local infrastructure and coordination among neighbours, the plan helps foster well-connected, resilient communities aligned with this well-being goal.</p>
Wales of vibrant culture and thriving Welsh language	<p>While our report focuses on infrastructure, it recognises the human dimension – working “directly with communities... reflecting real-life experiences”. By involving youth forums and diverse groups, it upholds cultural inclusivity. Adaptation efforts will protect historic towns and cultural landmarks from climate impacts, helping preserve Welsh heritage. The emphasis on local engagement means using accessible communication, so that the Welsh language thrives in public dialogue. The report’s people-first approach ensures that climate action strengthens rather than undermines Wales’s cultural vibrancy and linguistic heritage.</p>
Globally Responsible Wales	<p>The report aligns with this goal by positioning Wales as a leader in climate adaptation and encouraging collaboration. It notes that implementing a bold adaptation agenda would make Wales “one of the first countries” to give adaptation legal prominence, demonstrating leadership and foresight. By advocating for greater intergovernmental coordination, such as working through the British-Irish Council on climate resilience, it shows Wales acting responsibly and sharing solutions on a wider stage. Cutting emissions remains vital, but this plan ensures Wales also contributes to global well-being by adapting sustainably and helping others by example, consistent with being a Globally Responsible Wales.</p>

Nature emergency

The report supports action on Wales's nature emergency by backing solutions which will protect nature. Its recommendations (e.g. reforming planning policy and appraisal) press for factoring in ecosystem impacts and using natural flood management approaches. By aligning climate infrastructure plans with ecological needs – maintaining wetlands, expanding woodlands, designing with nature – the report's framework could help halt ecosystem degradation. This ensures climate responses also deliver for wildlife and habitats, answering the call to reverse the nature emergency.

Climate emergency

The entire thrust of our recommendations is a direct response to the climate emergency. It frames climate change as a present and escalating reality requiring that all organisations... act now to respond to the climate emergency. The recommended Climate Adaptation Bill would put adaptation on an equal footing with mitigation, embedding climate action across governance. While focused on adaptation, many measures will also cut emissions or enhance carbon sinks, complementing Wales's net-zero efforts. By treating adaptation with urgency and integration, the report reinforces Wales's overall climate emergency response – ensuring the nation not only reduces its carbon footprint but is also prepared for the climate impacts already in motion.

The socio-economic duty

The report's people-centric approach reflects the socio-economic duty by seeking to lessen inequalities exacerbated by climate change. It stresses that engagement must include marginalised communities who often face the worst impacts. By improving access to information, funding community resilience, and demanding that public bodies plan for everyone's needs, the recommendations aim for equity among communities. They encourage decision-makers to consider who benefits or is burdened by infrastructure changes – the due diligence the socio-economic duty calls for.

Long-term considerations

Consistent with the Well-being of Future Generations Act, our report is firmly focused on the long term. Our remit and vision explicitly looks ahead to infrastructure needs in 2050 and beyond. Every recommendation is mapped to future resilience: from requiring forward-looking climate risk assessments for future scenarios, to establishing continuous learning mechanisms like the Futures Hub. Our recommendations repeatedly call for planning beyond short political cycles – urging decisions that leave no community unprepared. By embedding long-term targets and monitoring, the strategy ensures present actions do not compromise future well-being. This proactive, future-focused mindset is exactly what long-term sustainability demands – a cornerstone of the assessment and a guiding principle throughout the commission's advice.

Appendix B: Engaging diverse place based communities in climate adaptation conversations and the impacts on infrastructure recommendations

Recommendation 1: Develop community peer-to-peer capacity building

Welsh Government should work with voluntary and community infrastructure bodies and funders to build skills and resources to enable communities to lead similar long-term and participatory conversations. This can start from building on the project activity in Grangetown and expand to communities elsewhere, with community anchor organisations likely to be effective agents for this in their respective communities. The project toolkit can provide an initial resource with further learning shared ongoing through a crowd-sourced resource (see also recommendation 6).

Recommendation 2: Build citizen-facing local evidence

Welsh Government should work with public bodies to develop online resources with citizen-facing local evidence about climate change, adaptation, and infrastructure at a local level. This is hard to find, and the gap can be filled with misinformation. This should blend data projections with wider evidence to support foresight.

Recommendation 3: Connect into wider activity for democratic renewal

Welsh Government should ensure that climate adaptation and infrastructure conversations are part of its wider activity to strengthen citizen involvement in democratic debate, including through the Welsh Government Innovating Democracy Advisory Group and Climate Conversations.

Recommendation 4: Invest in community involvement and explore the long term cost benefits

Government and infrastructure planners should increase investment in diverse community involvement in shaping climate adaptation and infrastructure planning in light of both the urgency to adapt infrastructure and diminishing public budgets. NICW should explore how to evaluate the cost benefit of early community involvement over the whole life of infrastructure developments.

Recommendation 5: Build the culture, skills, and confidence in infrastructure bodies to co-produce with diverse communities

Involving communities meaningfully demands certain values, skills, confidence, and capacity. This includes sharing power and resources and taking risks. It is more creative than traditional methods. Strategic, infrastructure and other bodies commissioning conversations should invest in staff capacity to do this well.

Recommendation 6: Wales should establish a shared resource such as a Futures Academy

Welsh Government and the Future Generations Commissioner should support a hub of practice where futures practitioners across all sectors and of all experiences can connect, share practice, and spread learning. Building ongoing learning about community foresight should be core to this. Crowdsourcing learning and resources will prevent valuable experience from being lost. The Welsh Government and the Future Generations Commissioner should incorporate this into their work to improve delivery against the Well-being of Future Generations Act.



Appendix C: Climate change projections, realities and infrastructure resilience recommendations

Review of data sharing

NICW to undertake a review into potential approaches for data sharing, including an understanding of data gaps, across infrastructure sectors in Wales to support improved climate and disaster data collection and to inform infrastructure planning, action and decision-making.

Set common climate data and scenarios

Welsh Government to develop statutory guidance which sets out a consistent approach for assessing climate risks and use of scenarios in infrastructure planning. For example, development of a Technical Advice Note to support Planning Policy Wales. This will support Planning Policy Wales and for the causes and impacts of climate change be fully considered in a consistent manner.

Establish national climate damage register

Welsh Government should develop a national climate damage register and mandate public sector and critical infrastructure providers to provide consistent damage assessment reports following climatic events. This would help Wales to better understand the costs and impacts of climate change and support business cases for adaptation responses. It is envisaged that this would be hosted on an appropriate platform, that may emerge from the research above.

Climate monitoring and evaluation

Welsh Government should adopt the powers provided in the Climate Change Act Section 67 to make reporting on climate adaptation mandatory across infrastructure sectors in Wales. This would align Wales with the UK's Adaptation Reporting Power (ARP) and should ensure that organisations report to a commonly agreed framework to enable direct comparison.

Leading action

Welsh Government should identify clear ministerial leadership for adaptation (i.e. Deputy First Minister and Cabinet Secretary for Climate Change and Rural Affairs). Through this role, a prioritised action plan should be developed to target and focus resources on key strategies, plans and activities, building on the Climate Adaptation Strategy for Wales (2024), to drive short-term action around adaptation.

Integration of adaptive approaches into planning

Welsh Government should conduct a comprehensive review of existing barriers and opportunities within the planning system to facilitate the adoption of adaptation pathways approaches and nature-based solutions. This review is essential to streamline the consenting process and ensure that infrastructure projects are resilient to future climate impacts.

Improved governance frameworks

Welsh Government should identify a clear, governance framework, that builds on existing groups and processes, to enable integrated working on infrastructure planning at national, regional and local levels. This should consider:

- Expansion of the remit of existing multi-organisation groups to embed climate adaptation at the core of engagement and all eventual plans (e.g. Local Resilience Fora (LRFs), Corporate Joint Committees (CJCs) or Public Service Boards (PSBs)), with additional resource to enable action.
- Direct and clear accountabilities and responsibilities for collaborative national, regional and local planning with appropriate resource to deliver on these roles.

Learning from others

Welsh Government should rapidly establish its intended Policy Futures Forum as a mechanism to create space for policymakers to learn from forward thinkers on climate adaptation. This should be supported by a Wales Infrastructure resilience and adaptation forum which would provide opportunities to collaborate and promote learning on climate change resilience and adaptation (e.g. adaptation pathways). Insights and learning should be captured and shared nationally, and where appropriate integrated into guidance.

Communication

Welsh Government to develop guidance into how cross-sector infrastructure planning and associated climate risks can be communicated to all relevant groups, including vulnerable groups, to help those people to make more informed decisions about investing in their own resilience and preparedness.

Benefits for communities

NICW to undertake research to better understand how economic, social and environmental benefits to enhanced resilience are currently understood by communities and stakeholders in Wales. This should build on existing surveys undertaken by Welsh Government within Wales.

Understanding vulnerable groups

Welsh Government should co-ordinate the development of a national register of vulnerable groups across Wales that are likely to be most impacted by infrastructure shocks to enable a more coordinated response to emergency situations.

Engaging with communities around infrastructure planning

Welsh Government to engage with communities around infrastructure planning: Determine how 'deliberative' community engagement methods on climate risk can inform national, regional and local infrastructure planning and pilot in a selected area.

Pilot the proposed approach in a specific region or locality to generate insights and learning of how this could be applied at a national scale.

Collaborative funding

Welsh Government should explore how infrastructure planning can be better aligned to enable cross-sectoral delivery. This should consider clear requirements in guidance and policy.

Welsh Government should identify and support a pilot a cross-sector regional infrastructure project that brings together parties to unlock co- benefits and adopt blended funding and financing models. This would also generate insights for a wider roll-out.

Catalysing secure funding

NICW should undertake a review of how Welsh Government and the Development Bank of Wales (DBW) can catalyse private sector finance, including through insurance, for infrastructure climate change adaptation and resilience.

Economics of resilience

The Welsh Government, in partnership with the UK Government, should conduct a national review of the economics of resilience and adaptation. This critical review will bolster the business case for infrastructure investment and should directly inform updates to the Green Book and other investment guidance. By doing so, it will support infrastructure decision-making at a comprehensive, whole-systems level, ensuring long-term sustainability and resilience.

Climate adaptation and resilience fund

Welsh Government should work with the Development Bank of Wales to establish a cross-sector climate adaptation and resilience fund that provides long-term, sustainable funding for adaptation which will collectively ensure that no viable climate adaptation project fails for lack of finance or insurance.

Mitigating future risks

Welsh Government should reform planning policy to prioritise climate resilience. This reform should mandate the consideration of all climate risks in built-environment projects and development plans. Furthermore, planning policy should actively promote development in resilient areas and strategically plan for future growth at a systems level to ensure long-term sustainability and protection against climate impacts, including building in buffers to absorb initial impacts.

Integrating climate resilience and adaptation

Welsh Government to explore and provide updated guidance that integrates climate adaptation and resilience into infrastructure planning. This should include providing consistent guidance to regulators, such as Ofwat, Ofgem, Ofcom and the ORR. This should support a consistent approach to how climate change is considered during price reviews and investment decisions to maximise efficiency and enable a whole system approach. Given the remit of most regulators expands beyond Wales, we recommend engagement with UK Government and the UK Regulators Network.

Moreover, climate mitigation and adaptation actions should be leveraged in ways that simultaneously support both sets of policy objectives, for example through stronger support for nature-based solutions.

A shared vision

Welsh Government and the Future Generations Commissioner should work together to enhance the Wellbeing of Future Generations Act to be more representative of whole society resilience, which helps to drive resilience action across Wales. A review should be undertaken to understand how this could best be facilitated.