CLIMATE CHANGE ADVISORY COUNCIL

Annual Review 2025

Preparing for Ireland's Changing Climate

Annual Review 2025: Preparing for Ireland's Changing Climate

Submitted to the Minister for Climate, Energy and the Environment on 26 September 2025

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Summary for All

Key observations

Under the National Climate Objective, Ireland has made a legal commitment to achieving climate resilience by no later than 2050. In this Review the Climate Change Advisory Council outlines observations and recommendations in support of this commitment. The effects of climate change are already being felt in Ireland. Recent storms Darragh and Éowyn have exposed weaknesses in the country's preparedness for extreme weather events – particularly in relation to critical infrastructures such as electricity, water and communication networks; the risk of coastal flooding in urban locations; and impacts on community health and wellbeing. Achieving resilience to the growing impacts of climate change will require effective adaptation measures, stronger leadership and coordinated action across all levels of Government.

Ireland's first National Climate Change Risk Assessment and integration of adaptation considerations in the revised National Planning Framework are positive developments that need to be built on. The urgent priority now is to move from planning to implementation, focusing on actions that will contribute the most to adapting effectively and enhancing resilience across national, sectoral and local climate action plans, and in the recently established decarbonising zones.[a] Actions will need to be targeted, ambitious and underpinned by robust monitoring, evaluation and adequate funding. Reporting on all actions on a regular basis is needed to ensure that resilience goals are met.

Scaling up the use of nature-based solutions across sectors and implementing comprehensive measures to conserve and restore priority habitats and species are urgently required to protect against the impacts of climate change.

Key recommendations

1. Starting in Budget 2026, the Government should provide annual defined funding to make climate action roles in local authorities and the climate action regional offices permanent. This will avoid the loss of critical expertise and protect the momentum of climate action implementation. Adequate and sustained funding must also be provided from central Government to support climate adaptation measures at a local level.
2. Across all sectors, the Government should ensure that actions with clearly defined resilience outcomes from the sectoral adaptation plans are included in the Climate Action Plan 2026. Progress on the implementation of adaptation policy measures should be reported every year to the Joint Oireachtas Committee on Climate, Environment and Energy.
3. Recognising that many extreme events have already become both more frequent and severe, the Government should establish the Extreme Weather Assistance Scheme before the 2025/26 storm season and ensure that it is permanent, appropriately resourced and has streamlined processes and procedures to allow for rapid response.

a Decarbonising zones are spatial areas identified by the local authorities where a range of adaptation, mitigation and biodiversity measures are identified and tested to address local and community needs.

Abbreviations

CARO	climate action regional office
DCEE	Department of Climate, Energy and the Environment
DHLGH	Department of Housing, Local Government and Heritage
DPENDR	Department of Public Expenditure, NDP Delivery and Reform
DZ	decarbonising zone
HAS	Humanitarian Assistance Scheme
LACAP	local authority climate action plan
NAF	National Adaptation Framework
NBS	nature-based solutions
NCCRA	National Climate Change Risk Assessment
NPWS	National Parks and Wildlife Service
OECD	Organisation for Economic Co-operation and Development
SAP	sectoral adaptation plan
SEAI	Sustainable Energy Authority of Ireland

Contents

Key observations

- Achieving climate resilience by no later than 2050 is a key element of the National Climate Objective. Stronger political leadership, attuned to climate resilience issues, is needed across all levels of Government, including at the highest levels, to ensure that Ireland is resilient to extreme weather events and their impacts, many of which are increasing in intensity and/or frequency as a result of climate change.
- The impacts of climate change are already being felt, and these will increase in magnitude and frequency in the future with additional warming. The cascading and compounding impacts of recent storms, including Storm Darragh and Storm Éowyn, where 768,000 households lost power, have exposed Ireland's vulnerability to extreme weather events and shortcomings in preparedness and response, especially in relation to critical infrastructure.
- Systemic external challenges are a critical risk to local authorities delivering the actions set out in the local authority climate action plans (LACAPs) and need to be urgently addressed by central Government. These include grossly inadequate funding for climate action capital projects, the temporary nature of climate staff contracts and insufficient numbers of staff for climate action overall. There is also a clear need, and opportunity, to coordinate actions in the LACAPs with relevant actions in the next iteration of the sectoral adaptation plans (SAPs) to ensure integration of climate action across scales.
- The first iterations of the SAPs were characterised by actions that were not specific and measurable, and most did not have key performance indicators or identified milestones. In the next iteration of the SAPs, there is a critical need for targeted and ambitious actions, with improved indicators and more robust monitoring and evaluation that can build on the adaptation indicators being developed within the United Nations Framework Convention on Climate Change.
- The Council is extremely concerned about the lack of implementation of the Biodiversity Sectoral Adaptation Plan (2019–2025) as per the continued findings of the Adaptation Scorecard. Degradation of biodiversity and ecosystems increases Ireland's vulnerability to climate change impacts, compromises the sustainability of food production and has negative impacts on human wellbeing. Scaling up the use of nature-based solutions across all sectors and implementing comprehensive actions to conserve and restore biodiversity are urgently required.
- Adaptation-related actions in the Climate Action Plan 2025 are mainly high-level actions linked to the finalisation of SAPs and the publication of the National Climate Change Risk Assessment (NCCRA). These are important actions to include, but there is a need now to prioritise the actions from each of the SAPs that will make the greatest contributions to enhancing adaptive capacity and climate resilience outcomes in future climate action plans.
- The Council welcomes the publication of Ireland's first NCCRA. It provides a comprehensive overview of national climate risks and impacts, including cascading impacts, and has served as a key reference in the development of the new SAPs.

It will be critical to update this assessment on a regular basis to reflect the latest developments in scientific understanding and ensure that the information provided is responsive to evolving stakeholder needs.

- In the LACAPs, only 13% of actions are classified exclusively as adaptation actions. Similarly, the recently established decarbonising zones primarily focus on mitigation issues, with only 8% of actions exclusively focused on adaptation.
- The Council welcomes the improved incorporation of climate change adaptation in the revised National Planning Framework. It is critical that this leads to multi-annual funding for adaptation projects and that the delivery of critical infrastructure projects does not lead to new risks or maladaptive outcomes.

Key recommendations

Adaptation measures at the local level

1. Starting in Budget 2026, the Government should provide annual, defined funding to make climate action roles in local authorities and the climate action regional offices permanent. This will ensure retention of the key expertise necessary to build momentum and accelerate the implementation of climate resilience measures.
2. The Department of Housing, Local Government and Heritage should develop statutory planning guidelines to integrate future climate projections and adaptation measures into regional and local development plans. This should cover all relevant climate hazards and risks that Ireland is exposed to, as identified in the NCCRA.
3. Departments and agencies leading SAPs should ensure that there is adequate and sustained funding to support local climate adaptation measures. The revised National Development Plan should ensure that national priorities translate into climate resilience projects at the local level, including those actions identified in the LACAPs.

Preparedness and response to extreme weather events

4. The Government should enhance community and individual preparedness for extreme weather events based on systematic reviews of the impacts of and the response to these events. The Council recommends the designation and resourcing of resilient local emergency response hubs and the promotion of individual preparedness measures as part of local authority emergency management plans for extreme weather events.
5. Recognising that many extreme events have already become both more frequent and more severe, the Government should establish the planned Extreme Weather Assistance Scheme before the 2025/26 storm season and ensure that it is permanent,

appropriately resourced and has streamlined processes and procedures to allow for rapid response.

6. The insurance industry should consider urgently developing innovative insurance products that incentivise proactive climate risk reduction measures for both households and businesses, and support build back better initiatives post extreme events.

Completion and implementation of sectoral adaptation plans

7. The Department of Climate, Energy and the Environment and the Department of the Taoiseach should ensure that the actions from each of the SAPs that will make the greatest contribution to climate resilience outcomes are included in the Climate Action Plan 2026. Responsible Ministers should report annually to the Joint Oireachtas Committee on Climate, Environment and Energy on the implementation of adaptation measures outlined in the SAPs.
8. Lead departments and agencies for SAPs should urgently conduct comprehensive skills and resource gap analyses to identify and address climate adaptation skills needs across all sectors, including in semi-state companies and the private sector.

Management of coastal change

9. The Inter-Departmental Group on National Coastal Change should develop a comprehensive national programme of coastal management measures to protect and preserve coastal areas at the local and regional scales. This programme should identify, assess and prioritise the implementation of these measures, and should in particular address the problems of present and likely future coastal erosion of vulnerable coastal areas.

Box 1 summarises key adaptation and resilience recommendations drawn from individual sectoral reviews published ahead of this Adaptation Review and as part of the Annual Review 2025.

Box 1. Adaptation and resilience recommendations across the Annual Review 2025

These sectoral recommendations from across the Climate Change Advisory Council Annual Review 2025 are critical for strengthening climate adaptation capabilities and climate resilience in Ireland; however, they are not explored in further detail within this Adaptation Review. Please refer to the relevant sectoral review for further information.[1]

Electricity sector
(Review published 29 April 2025)

- The Government must urgently prioritise a more systemic approach to the delivery of a resilient electricity system that can withstand and recover quickly from disruptions such as extreme weather, economic shocks and cyberattacks. This requires significant additional capital investments – beyond business as usual – close inter-agency coordination, robust resilience metrics and maximising innovative technology use.
- The Government should require all energy infrastructure developers to further assess and update plans to manage the risks associated with the range of climate scenarios and time frames outlined in the NCCRA.
- The long-term development of multiple maritime ports to facilitate the construction, operation and maintenance of offshore renewable energy infrastructure should be prioritised through a systemic approach. The forthcoming (revised) National Ports Policy provides an opportunity for the Department of Transport to set the imperative strategic directions to ensure the necessary investment in multiple port infrastructure projects to support offshore renewable energy deployment at scale.

Transport sector
(Review published 18 June 2025)

- Planning and support to realise the potential of vehicle-to-everything charging, including the development of appropriate guidance and technical standards for changeover switches, should be progressed immediately. Vehicle-to-everything charging can increase resilience in rural areas during power outages by providing temporary grid support while the main grid is restored and also enhance grid stability and reliability of renewable energy integration.
- Extensive damage caused by Storm Darragh resulted in the total closure of Holyhead Port between 7 December 2024 and 16 January 2025, with the port not due to fully reopen until July 2025. The impact on freight and passenger movements was significant. The urgent revision to the National Ports Policy by the Department of Transport must ensure that all ports take a harmonised approach to the integration of climate risks, to include cross-border and transboundary impacts, in port planning, operations, infrastructure investments and decision-making.
- The Government must scale up investment for measures to enhance the climate resilience of vulnerable and critical transport infrastructure, including road and rail routes and aviation infrastructure, and provide the necessary support services to ensure effective integration of these.

Box 1. Continued

Agriculture and Land Use, Land Use Change and Forestry sectors
(Review published 16 July 2025)

- The Department of Agriculture, Food and the Marine should develop and implement a strategy for the long-term management of the forest estate consistent with the principle of 'right tree in the right place with the right management'. This should include consideration of species, soil type and soil conditions; consideration of the replanting obligation in the context of existing poorly sited plantations; and consideration of forest management to provide carbon and biodiversity co-benefits and climate risk reduction. The strategy should cover the management of forest areas vulnerable to winter storms and other adverse climate impacts, including increased vulnerabilities to forest pests, diseases, wildfires and windthrow.
- The Council recommends that, through the Farm Advisory System, registered advisers continue to undertake and expand the range of professional development in relevant areas of climate science, emissions reduction and adaptation in order to support farmers with the skills and training to take climate action at farm scale and across all land uses.
- The Government should establish a dedicated unit to accelerate the deployment of nature-based solutions for the management of water resources and flood risk at catchment level. Large-scale pilot schemes should be designed with land holder engagement to roll out the deployment of these solutions.

Built Environment, Industry and Waste sectors
(Review published 3 September 2025)

- The Department of Climate, Energy and the Environment and the Sustainable Energy Authority of Ireland (SEAI) should prioritise the development and provision of wider support, guidance and standards for batteries and changeover switches, to increase customer resilience. Specifically, the Council strongly supports the ramp up of the Solar PV for the Medically Vulnerable Scheme of the SEAI and calls for the installation of suitable batteries, to support the needs of the medically vulnerable, and changeover switches, to support resilience during extreme weather events.

1. Introduction

Climate change impacts continue to occur at an ever-increasing pace and with increasing severity globally, across Europe and in Ireland. These impacts will only further increase in magnitude and frequency in the future, with additional warming resulting in damage to socio-economic systems, including loss of human life and significant disruption to global economic systems. In Ireland, cascading and compounding impacts from recent storms, including Storm Darragh and Storm Éowyn, have exposed vulnerabilities to extreme weather and highlighted shortcomings in preparedness and response.[a]

Under the National Climate Objective, Ireland needs to become climate resilient by no later than 2050. While this has yet to be clearly defined, resilience describes the ability of a social or ecological system to absorb disturbances while retaining the same basic ways of functioning, and a capacity to adapt to stress and change.[2] Adaptation actions lead to climate resilience. Adaptation refers to the actions and processes undertaken to help reduce the potential damages resulting from climate change; it can also include taking advantage of opportunities associated with climate change.[3]

While significant strides have been made in developing policy supports, including the National Adaptation Framework (NAF), sectoral adaptation plans (SAPs), local authority climate action plans (LACAPs) and the National Climate Change Risk Assessment (NCCRA), there is a need to create a coherent and cohesive policy landscape that focuses on actions that support resilience outcomes. The policy landscape should be based on climate resilience targets that result in transformative and significant actions. These actions need to be supported by the necessary financial and human resources as well as sustained political leadership across all levels of Government, particularly at the highest level.

There remains a risk that, going forward, climate adaptation continues to be managed largely in silos. While it is critical that there is a systemic approach with clear allocation of responsibilities for dealing with specific risks, it is also increasingly important that central Government has clear oversight to ensure that actions taken across sectors are mutually supportive and do not lead to maladaptation. Adapting effectively and building resilience demands cross-cutting thinking that considers confounding, cascading and interrelated climate impacts across systems and scales, and considers mitigation and adaptation actions as two interlinked, interdependent aspects of integrated climate action. Actions need to be specific, measurable and targeted. They also need to be supported by improved indicators and more robust monitoring and evaluation, supported in turn by a level of political attention commensurate to the climate risks Ireland is facing. Figure 1 illustrates the interconnected nature of climate change adaptation and mitigation, and maps the synergy space and co-benefits of resilience thinking by considering them in tandem.

a The impact of Storm Éowyn has been discussed in other chapters of the Annual Review, including the Our Changing Climate in 2024, Electricity and Transport Sectoral Reviews.

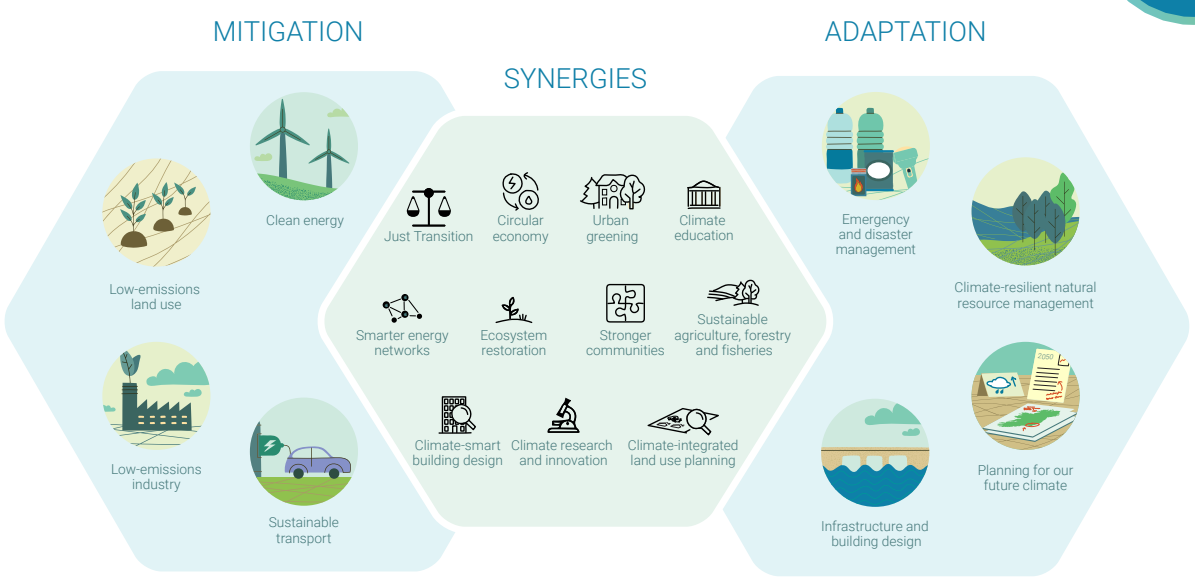

Figure 1: Opportunities for synergies and co-benefits from integrated adaptation and mitigation actions. (Source: Adapted from New South Wales Government.[4])

This Review sets out the key issues for adaptation in 2025. It begins with the fifth edition of the Climate Change Adaptation Scorecard, followed by a review of previous Council adaptation recommendations. An analysis and discussion of key themes of focus then provides additional context and details to support the headline recommendations and observations.

2. Adaptation Scorecard

Work on the fifth edition of the Climate Change Adaptation Scorecard was undertaken in 2025. The scorecard is an instrument employed by the Adaptation Committee to help monitor and review the progress of local authorities and Government departments towards climate resilience over the previous 12 months. It is based on questionnaires that are sent to lead departments for SAPs as well as local authorities and the Department of Climate, Energy and the Environment (DCEE), as the lead department for the implementation of the NAF.

The assessment of the scorecard questionnaires, by the Council Secretariat's Resilience Team in consultation and collaboration with the Adaptation Committee, is based on the degree to which progress is being made in the implementation of adaptation policy and increasing resilience under three categories during the period April 2024 to March 2025. The assessment is based on the scoring system outlined in Figure 2.

Figure 2: Scoring system used to track adaptation progress in the Climate Change Advisory Council Annual Review.

The three categories of assessment are as follows:

- **Governance and resourcing:** the extent to which systemic coordination of adaptation actions and planning is in place across sectors and scales, with relevant departments, agencies and local authorities putting in place the necessary human and financial resources for climate change adaptation.
- **Policy implementation and mainstreaming:** whether adaptation is being mainstreamed into policies, plans, strategies, programmes and frameworks, and whether implementation of SAPs and adaptation-related policies are resulting in meaningful impacts on climate-resilient development.
- **Risk and adaptive management:** the extent to which efforts are being made to understand and address current and future climate risks and knowledge gaps, and to proactively overcome barriers to adaptation.

Table 1 presents an overview of the results and analysis from the 2025 Adaptation Scorecard. The table presents the overall results for the 11 sectors and their results across the three categories of assessment.

The results of the assessment are that four sectors demonstrated good overall progress, four showed moderate progress, two showed limited progress, and biodiversity received an overall rating of no progress, with insufficient evidence available from the submission. The Council is extremely concerned about the lack of progress in implementing the Biodiversity Sectoral Adaptation Plan as per the continued findings of the Adaptation Scorecard over the period 2021–2025. The lack of governance structures for effective coordination and implementation of the Biodiversity Sectoral Adaptation Plan and the lack of capacity, funding and programmes for climate adaptation all need to be urgently addressed.

The results showed a slight decline compared with the scorecard results in 2024, with the same four sectors receiving an overall rating of 'good' but two sectors dropping from a rating of 'moderate' to 'limited' (health and communications networks). The 2025 Adaptation Scorecard also involved a review of progress in the implementation of actions in the SAPs, which covered the period 2019–2025. The review found that the SAPs lacked ambition and were characterised by actions that were not specific and measurable. In addition, most SAPs did not have key performance indicators or identified milestones. There is a critical need for targeted and ambitious actions, improved indicators, measurable outcomes and more robust monitoring and evaluation in the next iteration of the plans currently being completed.

The analysis presented in this section is abridged. A fuller version of the findings and observations for each sector can be found in a separate assessment report on the Climate Change Adaptation Scorecard, published concurrently with this Adaptation Review.

Table 1: 2025 Adaptation Scorecard assessment results.
DAFM, Department of Agriculture, Food and the Marine; DCCS, Department of Culture, Communications and Sport; DCEE, Department of Climate, Energy and the Environment; DHLGH, Department of Housing, Local Government and Heritage; DoH, Department of Health; DoT, Department of Transport; OPW, Office of Public Works.

Rank	Sector	Governance and resourcing	Policy implementation and mainstreaming	Risk and adaptive management	Overall
1st	Transport (DoT)	Advanced progress	Good	Good	Good
2nd	Flood risk management (OPW)	Good	Good	Good	Good
2nd	Built and archaeological heritage (DHLGH)	Good	Good	Good	Good
4th	Local government	Good	Good	Moderate	Good
5th	NAF (DCEE)	Moderate	Moderate	Good	Moderate
5th	Electricity and gas networks (DCEE)	Good	Moderate	Moderate	Moderate
5th	Agriculture, forestry and seafood (DAFM)	Moderate	Moderate	Good	Moderate
5th	Water quality and water services infrastructure (DHLGH)	Good	Moderate	Moderate	Moderate
9th	Communications networks (DCCS)	Moderate	Limited	Limited	Limited
9th	Health (DoH)	Limited	Moderate	Limited	Limited
11th	Biodiversity (DHLGH)	No progress/ insufficient evidence	No progress/ insufficient evidence	No progress/ insufficient evidence	No progress/ insufficient evidence

3. Progress on previous Council recommendations

The Council has previously emphasised the need to strengthen and better integrate Ireland's adaptation planning across national, sectoral and local levels, engage the private sector and local communities, and establish adaptation indicators and measurable key performance metrics. The revised NAF, published in June 2024,[2] mandates the National Adaptation Steering Committee to facilitate inter-sectoral dialogue and promote the integration of cross-sectoral adaptation actions across policies and plans. It also underscores the vital roles of local knowledge, community involvement and private sector engagement in shaping effective adaptation responses. SAPs for 13 priority sectors are currently in development, with submission to the Government expected in Q3 2025 and final approval in Q4 2025. To support this process, updated sectoral planning guidelines,[5] published in August 2024, set out the need for sectors to prioritise impactful actions, assign measurable indicators and

associated costs, and outline a clear implementation and monitoring strategy. A pilot study for the Transport sector, published in July 2024,[6] provides further support with practical guidance on the development of climate adaptation indicators, identifying 14 key lessons and 6 recommendations relevant to all sectors. The NCCRA,[7] published in June 2025, provides further support for a more consistent, integrated and evidence-based approach to adaptation. Timely finalisation and publication of the SAPs will be crucial to advancing a standardised and effective approach to adaptation action across all levels and sectors.

The Council has repeatedly called for funding for adaptation to be prioritised in annual and multi-annual Government funding cycles. Some progress has been made on tracking the integration of adaptation into the budgetary cycle, although it remains complex to separate and apportion Government funding for climate adaptation only. Annual expenditure of €3.923 billion favourable to adaptation was reported in the 2025 Revised Estimates for Public Service,[8] in accordance with the EU taxonomy for sustainable activities. Key adaptation-related programmes identified include flood risk management activities, retrofit programmes, agri-environment schemes, a range of programmes related to water quality, flood forecasting and warning services, the provision of climate services, and international climate finance. This was a substantial increase on the €2.64 billion considered favourable to adaptation in 2024. The year-on-year increase can be explained by the inclusion of significant expenditure that indirectly resulted in favourable impacts on adaptation in this assessment for the first time. The report also identified €350 million of expenditure considered unfavourable to climate change adaptation and acknowledged that this is likely to be an underestimate. This reflects the limitations of the current assessment methodology, which will be developed further in 2025 to capture unfavourable adaptation expenditure more accurately. Some challenges regarding adaptation spending have also been identified at both central and local levels, as the distinction between business-as-usual repairs and adaptation measures is not always clearly defined in projects.

Overall, the Department of Public Expenditure, NDP Delivery and Reform (DPENDR) notes the challenge of identifying relevant, reliable and consistent approaches for undertaking these budgetary assessments as well as some of the shortcomings, such as the necessary but limiting assumptions that are used, reliance on probability of outcomes and the lack of granular detail at project level. From 2026 to 2030, the DPENDR can request drawdown of up to 22.5% of the Infrastructure, Climate and Nature Fund each year (capped at €3.15 billion)[9] for designated environmental projects. It is imperative that this fund considers adaptation as part of its remit to encourage private capital investment in long-term strategic adaptation projects.

The Council previously recommended that by the end of 2025 the Government has a clearly defined and implemented programme to build public sector capacity for climate adaptation. The Climate Action Plan 2024 included an action to roll out centralised climate-related training for the civil service, and the latest climate action plan progress report confirms that this has been completed. However, none of the training opportunities delivered was specifically focused on climate adaptation. Furthermore, participation remains voluntary, with the exception of senior leaders, who are required to complete the training every 18 months under the Public Sector Climate Action Mandate. Separately, a report on the public sector's capacity to deliver climate action, originally due in 2023, was completed by the Institute of Public Administration and discussed by the Climate Action Delivery Board in May 2024.[10] The board accepted a key recommendation to prioritise climate adaptation across the whole of Government, with a senior officials sub-group established to examine governance and leadership mechanisms. The Council hopes that the work of the Senior Officials Group will lead to an increased Government focus on adaptation, with the necessary investment in improving governance and human and financial resourcing.

The Council previously urged for the establishment of a national climate damage register to monitor the financial and spatial impacts of extreme weather events, to help support the full quantification

of costs, including cascading impacts, where possible. To date, this register has not been established, and the collection of information on the impacts of extreme weather events remains fragmented across a range of stakeholders and without clear coordination. The Council has identified the need for the Government and relevant agencies to strengthen collaboration in this area and build on promising initiatives, such as the Weather Impact Register (WIRE) app, and the existing information that is collected by insurance companies as well as various semi-state companies on the costs of extreme events.

The Council has also called for adequate resourcing of the National Parks and Wildlife Service (NPWS) to ensure that increased human and financial resources are dedicated to conservation and restoration initiatives that will enhance the resilience of habitats and species to climate change. The increased investment in Budget 2025, with €78 million allocated to NPWS in 2025, a rise of 25% compared with 2024,[11] is a welcome step at a critical time to support the development of the National Nature Restoration Plan.

4. Analysis and discussion of key themes of focus

4.1. Governance and leadership

It has been widely acknowledged that adaptation to climate change has not received sufficient political and policy attention to achieve national and EU commitments to become climate resilient by mid-century.[12,13] This is evidenced by the limited allocation of resources, resulting in the inability to comprehensively plan for and implement the measures required to both adapt and build resilience to climate change. As a result, Ireland is in the initial stages of addressing the adaptation challenge. To this end, it is a welcome development that the Senior Officials Sub-Group on Adaptation was convened in 2024 to carry out a stocktake on adaptation policy and action across Government.

The Climate Action Plan 2025 states that adaptation is mainstreamed across the plan as a whole and that relevant actions are incorporated in an adaptation section as well as under different sections of the plan. The main actions under the heading of adaptation (actions AD/25/3 to AD/25/16) are process based and include the development of the different SAPs and the submission of a memorandum to the Government seeking approval of the SAPs by Q3 2025. The other actions under the heading of adaptation are AD/25/1, which aims to improve the resilience of Ireland's water infrastructure through implementation of a nature-based solutions (NBS) programme; AD/25/2, on the publication of the NCCRA; and AD/25/17, on the submission of the report on adaptation progress to the EU, under the Governance Regulation. Several other actions in sections such as transport, agriculture, the marine environment and Just Transition offer potential for adaptation co-benefits, but there is limited overall focus on actions to advance climate resilience. DCEE and the Department of the Taoiseach should ensure that the actions from each of the SAPs that will make the greatest contribution to climate resilience outcomes are included in the Climate Action Plan 2026. Responsible Ministers should report annually to the Joint Committee on Climate, Environment and Energy on the implementation of the adaptation measures outlined in the SAPs, in line with Section 14A of the Climate Action and Low Carbon Development (Amendment) Act.[14] Moreover, the Department of the Taoiseach should ensure that inter-departmental governance structures are strengthened, and that regular scrutiny of adaptation issues is included at the highest level of Government.

4.2. Finance

Climate-related financial losses are projected to increase as the physical impacts of climate change increase in frequency and severity, with the potential for grave socio-economic consequences, including for employment, health, productivity and food security.[15,16] In this context, investment

in adaptation can provide significant economic opportunity and social benefit. Globally, however, investment is not yet occurring at the scale necessary, and a step change is needed.[17] The Sixth Assessment Report of the Intergovernmental Panel on Climate Change[18] highlights limited resources, lack of private sector engagement and insufficient mobilisation of finance as key barriers to climate adaptation, with widening disparities between the estimated costs and the finance allocated to adaptation. A 2023 report published by the United Nations Environment Programme[19] estimated that only 9% of global climate financing is focused on adaptation, with the majority of this flowing from public funding sources. Governments have a central role in providing the necessary policy framework to encourage private sector investment in adaptation.[17] Moreover, it will become increasingly difficult for residential, community and business sectors to secure insurance as climate-related impacts increase. This adds additional weight to the need to invest now in adaptation action to both address the existing adaptation deficit and reduce future costs.

The Organisation for Economic Co-operation and Development (OECD) highlights the key role of the public sector in building market momentum for green financial instruments that support adaptation. The Climate Adaptation Investment Framework,[16] published in November 2024, aims to help governments strengthen policies in support of increased investment in adaptation, thereby minimising climate risk and maximising the opportunities offered by successful adaptation activities. The socio-economic benefits of adaptation investments and the long-term risks posed by climate impacts are often insufficiently internalised by, and inadequately communicated to, the private sector. Targeted public sector support is justified to unlock private investment in climate adaptation. This may include financial incentives (e.g. grants or tax relief), regulatory or technical support, and de-risking instruments (e.g. Government guarantees, concessional finance or climate risk disclosure frameworks) to reduce barriers for both project developers and institutional investors.[17,16]

Climate risks should be systematically and consistently considered and addressed in all relevant investments to enable widespread adaptation financing, rather than on a project-by-project basis. The recent NCCRA provides an opportunity to inform future funding decisions by guiding on climate risks in Ireland.[20]

Financial instruments to incentivise private sector investment in adaptation can be delivered through different institutional arrangements, including multilateral institutions, national development banks, specialised public and private green investment banks, and local financial institutions (particularly with respect to small and medium-sized enterprises).[16] However, these institutions themselves face climate-related financial risks,[19] as well as having a key role to play in supporting adaptation through the delivery of financial products and services. The United Nations Environment Programme has developed guidance[19] to help banks accelerate their efforts in managing climate-related impacts and financing climate adaptation. The guidance includes a pilot framework to assist banks in setting adaptation targets and incorporating adaptation considerations in their transition plans and sustainability strategies, while leveraging the co-benefits of adaptation with climate, nature and other aspects of the United Nations Sustainable Development Goals. This guidance acknowledges that, by working with governments and industries, banks can advocate for enabling conditions for mobilising private sector finance for adaptation. Since 2022, the Central Bank of Ireland has chaired the Climate Risk Sustainable Finance Forum (Climate Forum), which aims to build a shared approach between the financial sector and the Central Bank of Ireland to understanding and managing the financial risks and opportunities posed by climate change.[21] Providing institutions with a mandate to support adaptation efforts can encourage a greater focus on supporting investment in adaptation.[16] The 2024 Adaptation Scorecard[22] highlights the need to scale up financial investments across departments and local authorities to prioritise climate adaptation and resilience measures in relevant budget subheads, schemes and supports. It also encourages lead departments and local authorities to track and report expenditure, investment needs and the impacts of adaptation-related expenditure

on an annual basis. This would create greater financial transparency and alignment of national- and local-level funding by establishing a shared framework for reporting and impact evaluation. It would also support the identification of funding gaps and evidence-based prioritisation of adaptation funding.

Several departments have established funding structures to support targeted investment in adaptation and strengthen integration between national and local governance, including the Department of Transport, which provides annual funding to local authorities to increase the resilience of the regional and local road network, and the Department of Housing, Local Government and Heritage (DHLGH), which runs a number of funding schemes that integrate measures to enhance the resilience of heritage sites to extreme weather events. In relation to flood risk management, the Office of Public Works has integrated climate adaptation into existing budget streams and developed climate change adaptation plans for each flood relief scheme,[22] which detail how climate change is considered in project design and specific adaptation measures.[23] Multi-annual funding for flood relief schemes is available through the framework of the 2040 National Development Plan. There is currently no compensation scheme in place for households and businesses affected by river and coastal flooding, although a Voluntary Homeowners Relocation Scheme was introduced by the Government in 2017 as a one-off measure to address the flooding of homes in the winter of 2015/16.[24] The Council notes and welcomes commitments in the report of the Inter-Departmental Group on National Coastal Change Management Strategy to identify the most appropriate measures and mechanisms to support a managed retreat option for communities and properties at risk from coastal change.

More generally, the Climate Action Fund[25] provides financial support to projects that will help Ireland achieve its climate targets, with €61.5 million from this fund invested in community climate action projects up to 2027. However, climate adaptation is not explicitly included as a core eligibility theme within the fund. This represents a missed opportunity to mainstream adaptation across community-led projects. The Council supports including adaptation explicitly, to foster more integrated and cross-sectoral investment in climate resilience and ensure alignment with national adaptation priorities. Regular reporting on the implementation of the Climate Action Fund, including the categories of projects supported, levels of funding and locations, is also encouraged. Further in-depth research on establishing a public–private funding stream for climate adaptation should be considered by the Government.

Departments and agencies leading SAPs should ensure that there is adequate and sustained funding to support local climate adaptation measures. The revised National Development Plan should ensure that national priorities translate into climate resilience projects at the local level, including those actions identified in the LACAPs. This financial support should strengthen integration with local authorities to prioritise increased funding for adaptation projects linked to flood relief schemes, regional and local road maintenance, coastal erosion management, use of NBS in the public realm, drainage, and the renovation, restoration and protection of heritage sites. Specific seed funding mechanisms should be established for climate resilience measures in decarbonising zones (DZs), as currently there is not an established funding mechanism to support DZ activation. There are currently 41 DZs across Ireland, of which 29 are urban, 6 are partly urban and 6 are rural. DZs provide the opportunity to foster a community-driven approach to climate action, providing local authorities with the mandate to innovate and develop demonstration projects, while the most successful projects can be replicated nationally.

4.3. Local government constraints

Local authorities have reiterated in their scorecard submissions persistent challenges that are hindering climate action. These include grossly inadequate funding for capital projects, the temporary nature of climate-related staff contracts and an overall shortage of personnel dedicated to climate. Starting in Budget 2026, the Government should provide annual, defined funding to make climate action roles in local authorities and the climate action regional offices (CAROs) permanent. This will ensure retention of the key expertise necessary to build on momentum and accelerate the implementation of climate resilience measures. These posts should be designed and structured to address adaptation and mitigation priorities in a balanced manner. The temporary nature of the contracts for climate action staff and high levels of staff turnover are considered major risks to the delivery of the LACAPs, including the Community Climate Action Programme[26] and DZs.[27] Staff retention is a challenge, as seen in the 3-year contracts for the community climate action officers who manage the Community Climate Action Programme. Many leave their temporary posts before their conclusion for more secure, long-term roles. This presents significant challenges for local authorities in filling the remaining term and potentially disrupts project and programme management. Similarly, the climate action coordinator and climate action officer roles are 5-year temporary contracts.

Additionally, there is limited funding for climate action capital projects and support for community engagement actions. As a result, local authorities are actively exploring alternative funding sources, such as EU projects and private partnerships, to bridge these gaps and support LACAP implementation. While these efforts are commendable, relying on ad hoc or externally sourced funding is not a sustainable solution and highlights the inadequacy of core national resourcing to support the full implementation of the LACAPs.

The Council acknowledges the support provided by DCEE for climate action roles at both local authority and CARO levels. However, there is a need for stronger collaboration between central and local government to secure funding and implement targeted adaptation measures.

The Council is particularly concerned about the limited focus on climate adaptation within the LACAPs. Local-level planning and implementation remain key areas where adaptation efforts must be scaled up. The CAROs, which coordinate local authority responses to climate change, undertook an analysis of 31 LACAPs that were adopted in 2024.[28] A total of 3,935 actions were adopted in 2024 across all 31 LACAPs. Of these, only 13% are classified exclusively as adaptation actions, while 49% are identified as addressing both mitigation and adaptation. Additionally, the analysis identified 653 actions that are related specifically to DZs, and only 8% of these are exclusively adaptation actions. This underscores the imbalance between adaptation and mitigation actions. There is a need for greater prioritisation of adaptation measures in LACAPs and DZs, such as NBS, flood relief measures, early warning systems and measures to build resilience across the regional and local road networks and heritage sites. These measures must be supported by dedicated funding to ensure effective implementation. The 2024 Adaptation Scorecard report calls for integration of biodiversity and NBS in climate-related funds and schemes at local authority level. A report commissioned by the Council and published in 2024[29] identifies both funding constraints and a lack of collaboration across departments as major barriers to implementing NBS. It calls for further funding supports as well as the integration of NBS into existing climate-related funding schemes.

The reforms to the planning system outlined in the Planning and Development Act of 2024[30] offer an opportunity to better integrate future climate projections and adaptation measures into regional and local planning. The review of regional spatial economic strategies (which are now to include a strategy relating to climate change adaptation and mitigation), the alignment of more strategic county and city development plans with the revised National Planning Framework, and the development of new

area-based plans all offer opportunities to reflect the priorities for adaptation measures and avoid enhancing climate risks and maladaptation linked to the expansion of critical infrastructure and housing developments. These plans should take into consideration the scenarios and timelines used in the NCCRA, TRANSLATE projections and Met Éireann guidance on sea level rise. DHLGH should develop statutory planning guidelines to integrate future climate projections and adaptation measures into regional and local development plans. This should cover all the relevant climate hazards and risks that Ireland is exposed to, as identified in the NCCRA.

4.4. Preparedness and response to extreme weather events

4.4.1. Lessons from Storm Éowyn

Storm Éowyn served as a reminder of Ireland's vulnerability to extreme climate events and the extent of the adaptation deficit.

The Council highlights the urgent need to improve preparedness and response to climate extremes through multi-hazard early warning systems, strengthened community and individual capacity, an upskilled workforce, resilient infrastructure, an insurance industry that incentivises climate risk reduction, and permanent assistance schemes.

Box 2 presents lessons from Storm Éowyn, updated from the initial summary of the storm event provided in the Annual Review publication Our Changing Climate in 2024, published in March 2025.[31]

Box 2. Initial lessons from Storm Éowyn

Storm Éowyn hit Ireland on 24 January 2025. It was an exceptionally powerful extratropical cyclone. While approaching Ireland it underwent a phase of explosive intensification, with an exceptional pressure drop of 50 hPa[a] in 24 hours.[32] The storm set new records for measured wind speed in Ireland, with sustained hurricane-force winds of 142 km per hour and gusts of 184 km per hour recorded at Mace Head, County Galway.[33] The insurance industry also confirmed that the storm is the most expensive storm-related insurance event in Irish history, with claims in excess of €301 million. This surpasses the financial impact of Storm Darwin (2014) and the January 2010 freeze.[34] Despite the damage caused by the storm, its peak surge coincided with a low and ebbing tide, resulting in little to no flooding impacts. Had it struck during a high tide, record-high flooding would have been inevitable.[35] Met Éireann has warned that storm surges, coastal flooding risk and compounding events will become more frequent.[36]

Key reflections from Storm Éowyn include the following:

1. **Critical infrastructure is not resilient enough.** A total of 768,000 customers lost their electricity supply,[37] over 200,000 premises were left without water[38] and 1 million telecom users were left with no broadband or phone coverage.

a hPa (hectopascal), a unit of atmospheric pressure equal to one millibar.

Box 2. Continued

2. **Community support played a key role in the storm response.** Local businesses and community centres offered charging points, food and hot water to neighbours left without power and water supply, demonstrating the importance of building capacity and strengthening cooperation within communities.[39]
3. **Energy-efficient technologies enhanced household resilience.** Some residents were able to self-generate electricity using battery storage systems and by connecting electric vehicles through vehicle-to-load devices.[40] Homes that had undergone retrofitting, along with Nearly Zero Energy Buildings, also minimised heat loss.[41]
4. **Timely warnings helped mitigate some of the storm's impacts.** In addition to the red weather warning issued by Met Éireann, the Government shared safety guidelines for the public to follow in advance of the storm.[42]
5. **Agriculture and forestry continue to be highly vulnerable to extreme climate events.** Widespread damage to agricultural infrastructure, including farm sheds and polytunnels, as well as forestry stocks, was reported.[43] It is noted that a taskforce was established to ensure that storm-damaged forests are managed safely and appropriately.[44]
6. **The Humanitarian Assistance Scheme (HAS) did not support all impacted individuals effectively.**[45] Although the HAS was activated to provide financial assistance to households affected by Storm Éowyn across the country, there were delays in processing payments; by May, only half of the registered applications had resulted in payment.[46] Additionally, the HAS does not cover commercial, agricultural or business losses.[47] It is noted that supports have been made available to farmers under the Targeted Agricultural Modernisation Scheme to deal specifically with storm-related damage on farms.[48]
7. **There is a shortage of skilled workers needed to respond to climate emergencies.** A total of 285 skilled contractors from the EU and UK were flown in to support ESB Networks teams nationwide.[49] While this demonstrates international cooperation, it also underscores the need to expand the workforce to build capacity for emergency response actions.

4.4.2. Early warning systems

Effective early warning systems are of utmost importance in enhancing preparedness for and reducing the risks from extreme weather events. The United Nations Framework Convention on Climate Change COP28 Climate Change Conference decision on the global stocktake calls on all Parties to establish multi-hazard early warning systems by 2027.[50] This builds on an earlier call from the United Nations Secretary-General to protect everyone on Earth through universal coverage of early warning systems against extreme weather and climate change by 2027 and the launch of the Early Warnings for All Initiative Executive Action Plan 2023–2027.[51] The plan outlines four key pillars for multi-hazard early warning systems: (1) disaster risk knowledge, (2) observations and forecasting, (3) dissemination and communication, and (4) preparedness and response capabilities.

In Ireland, Met Éireann issues colour-coded weather warnings and advisories to inform preparedness actions aimed at the protection and safety of life and property and support impact-based decision-making for weather events, including wind and coastal wind, rain, snow/ice, low

temperatures/ice, high temperatures, thunderstorms and fog.[52] While these warnings and advisories are shared at the county level and have been effective in communicating information to the general public, more localised, high-resolution and real-time early warning systems are needed for flood events as well as other priority climate hazards identified in the NCCRA Technical Guidance,[53] such as wildfires, different types of droughts and marine heatwaves, to complement existing early warning systems.[54–56] Relevant Government departments and agencies should engage with local authorities to develop localised early warning systems for priority climate hazards and for highly vulnerable areas.

4.4.3. State support schemes

State support schemes have been put in place to support households and businesses damaged by flood and extreme weather events. These include the HAS for households[57] and the Emergency Humanitarian Flooding Scheme[58] for small businesses. Recent anecdotal end-user experiences of flooding events and the extreme wind damage caused by Storm Éowyn[45,59–61] have highlighted several shortcomings in these support schemes, including:

- complex application procedures to access emergency funding support,
- inefficient procedures and delays in processing applications,
- lack of accessible support services to address the health and mental health impacts of flooding events,
- lack of clarity on eligibility and coverage of these schemes regarding issues such as means testing, coverage of structural repairs, and supports to enable longer term build back better standards.

Recognising that many extreme events have already become both more frequent and more severe, the Government should establish the planned Extreme Weather Assistance Scheme before the 2025/26 storm season and ensure that it is permanent, appropriately resourced and has streamlined processes and procedures to allow for rapid response. The Department of Enterprise, Tourism and Employment, the Department of Social Protection and the Department of Agriculture, Food and the Marine should be involved in the development of the scheme.

4.4.4. Community and individual resilience

During Storm Éowyn, local authorities coordinated an emergency assistance response at the community level. Over 280 emergency response hubs were established in the counties most affected by service outages. These hubs, led by communities with financial and administrative support from local authorities, assisted with basic needs such as water, hot food, phone charging, broadband access and shower facilities.[62] In preparation for future extreme weather events, the Government should ensure that these hubs are equipped with emergency supplies and off-grid backup power systems, and that citizens are aware of their location.

At the individual level, electrical generators and vehicle-to-everything charging were used to provide temporary replacement power.[39] Additional projects with rural communities should explore renewable microgeneration and microgrid storage opportunities that can improve both individual and community resilience during power outages, including the development of appropriate guidance and technical standards for changeover switches.

The EU is calling on all Member States to strengthen individual resilience against future crises, including climate-related events.[63] One of the actions of the Preparedness Union Strategy is to develop a 72-hour survival kit that would allow citizens to be self-sufficient for at least 3 days in the event that they are cut off from essential supplies. The first 72 hours following an emergency are often the most critical; emergency services may be overwhelmed and access to basic necessities can be limited. By being self-sufficient for at least 3 days, individuals can reduce the strain on emergency services and ensure their own safety and wellbeing. This action, if adopted by local communities at the individual level, would increase resilience, but it requires Government support to help encourage uptake and implement effectively.

The Government should enhance community and individual preparedness for and response to extreme weather events based on systematic reviews of the impacts of and response to these events. The Council recommends the designation and resourcing of resilient local emergency response hubs and the promotion of individual preparedness measures as part of local authority emergency management plans for extreme weather events.

4.4.5. Role of insurance

The insurance industry has a key role to play in increasing the climate resilience of society and the economy. The European Insurance and Occupational Pensions Authority[64] estimates that only one-quarter of the total economic losses caused by extreme weather and climate-related events are covered by insurance, which leaves a substantial protection gap. Unless countermeasures are taken, this gap is likely to widen with the expected growth in physical risk exposures and insurance claims, with potential losses likely to become larger and less predictable.[16] While climate change is a growing risk for the insurance industry, it also creates opportunities. By taking a more proactive approach to risk management, insurers can not only protect policyholders from losses but also ensure the long-term availability of insurance products and reduce the overall cost of insurance.

The Central Bank of Ireland undertook research into the nature and scale of the flood protection gap.[65] Its 2024 report found that only 1 in 20 buildings has difficulty accessing flood insurance in Ireland, and that the estimated average annual cost of flooding is €101 million. Moreover, a loss of €510 million is expected about once every 25 years. It cautioned that the increasing likelihood of flood events due to climate change is likely to widen the flood insurance gap and reduce reinsurance availability. The report, however, did not cover impacts from other extreme weather events, such as storms with high winds, coastal erosion, droughts and wildfires.

Overall, there is considerable scope to expand the use of and access to different insurance mechanisms to address barriers to insurance coverage and to enhance resilience to extreme events. The OECD Climate Adaptation Investment Framework recommends the use of innovative tools such as index insurance.[16] Index insurance pays out benefits on the basis of a predetermined index (e.g. rainfall level) for loss of assets and investments resulting from weather and catastrophic events. Because index insurance does not necessarily require the traditional services of insurance claims assessors, it enables the claims settlement processes to be sped up. The OECD framework also notes that traditional insurance coverage involves the like-for-like replacement of damaged assets, but should instead support investment in adaptation through simple measures such as enhancing flood resilience (e.g. raising critical equipment to a higher floor). The insurance industry should consider urgently developing innovative insurance products that incentivise proactive climate risk reduction measures for both households and businesses, and support build back better initiatives post extreme events.

4.5. Critical infrastructure

The Council has previously recommended greater prioritisation of projects that enhance the resilience of critical infrastructure, including an all-island approach for the management of cross-border infrastructure and natural systems. It has also called for commercial semi-state companies and regulators to prioritise projects to enhance the resilience of critical infrastructure in their budgeting frameworks. The cascading impacts from storm events in late 2024 and early 2025 have laid bare the vulnerability of critical infrastructure to extreme weather events.

An implementation update in relation to the Climate Action Framework for commercial semi-state companies was published in October 2024, confirming that 10 (of 26) bodies have adaptation plans in preparation, 20 are assessing exposure to climate hazards and 18 have identified key vulnerabilities.[66] In the Electricity sector, ESB Networks has published its Winter 2025 Grid Resilience Plan, which includes €23 million in funding and operational measures, such as surveying 23,000 km of power lines and doubling emergency supplies, while also proposing statutory forestry corridors as a long-term resilience measure.[67] In the Water sector, Uisce Éireann has recently concluded the public consultation for the €6 billion Eastern and Midlands Water Supply Project,[68] which aims to improve capacity, resilience and security of supply for the eastern and midlands regions. The Water Services Policy Statement (2024–2030) of the DHLGH commits to the establishment of a National Water Conservation Working Group to advise on future strategies for water conservation and prioritisation of resources during periods of water stress. In the Transport sector, Transport Infrastructure Ireland is continuing its work on detailed climate risk assessments to inform its 2025 Climate Adaptation Implementation Plan, due for delivery in 2025,[69] and Irish Rail has published its Climate Change Adaptation Strategy for 2024–2029[70] and is advancing critical coastal protection works under the East Coast Railway Infrastructure Protection Project, fortifying parts of the Dublin to Wicklow coastal railway line that are vulnerable to coastal erosion, sea flooding and storm damage. The adoption of a standard approach for the identification of adaptation pathways, trigger points for planning and a common dashboard or report for all critical infrastructure would be useful for critical infrastructure resilience-building purposes. This could help identify when specific upgrades or projects should be commenced to make sure that they are delivered when needed.

Commercial semi-state companies and regulators are further encouraged to prioritise projects to enhance the resilience of critical infrastructure in their budgeting frameworks. There are significant forthcoming opportunities for this through the Commission for Regulation of Utilities' Price Review 6 mechanism for the period 2026–2030, Uisce Éireann's Strategic Funding Plan (2025–2029) and the Infrastructure Manager Multi-Annual Contract of Iarnród Éireann (2025–2029), among others.

The transposition of the EU Resilience of Critical Entities Directive into Irish law (SI 559/2024) in October 2024 provides a regulatory framework to strengthen the resilience of critical entities against a range of threats, including natural hazards, terrorist attacks, insider threats and sabotage, as well as public health emergencies.[71] It covers the sectors of energy, transport, banking, financial market infrastructure, health, drinking water, wastewater, digital infrastructure, public administration, space, and large-scale food production, processing and distribution. It commits the Department of Defence to developing a strategy for the resilience of critical entities by Q1 2026. The strategy is to be coordinated across Government through the Government Task Force on Emergency Planning.

While some progress is evident on all-island collaboration, including under the Shared Island Initiative and through the finalisation of the All-Island Strategic Rail Review, major infrastructure projects such as the North South Interconnector face ongoing delays and legal obstacles. Further coordinated action is needed to deliver climate-resilient infrastructure that reflects shared risks and opportunities across the island.

4.6. Decision-making under uncertainty

Decision-making under uncertainty is a central challenge in long-term planning for climate change adaptation, especially in relation to critical infrastructure. Climate systems are inherently complex, with future conditions – such as temperature rise, precipitation patterns and extreme weather events – difficult to predict with precision. Decision-making under uncertainty in climate adaptation is about balancing risks, costs and benefits in a dynamic environment.[72] It requires a shift from seeking optimal solutions to embracing adaptive, inclusive and robust strategies. Use of the 'precautionary principle' may sometimes be the best approach in adaptation planning and the implementation of projects.[73]

To navigate the uncertainty challenge, decision-makers must increasingly rely on flexible, robust approaches.[74] Adaptive management emphasises iterative learning, monitoring and adjustment over time.[75] Scenario planning explores multiple plausible futures to test the resilience of adaptation options.[76] Robust decision-making[77] and real options analysis are also widely used. Robust decision-making identifies strategies that perform well across a wide range of potential futures, while real options analysis values flexibility and the ability to delay decisions until more information becomes available.

Stakeholder engagement is crucial. Incorporating local knowledge and values ensures that adaptation strategies are contextually relevant and socially acceptable, even when scientific certainty is limited. 'Serious games' can contribute to creating low-stakes spaces for constructive dialogue and social learning.[78] The Intergovernmental Panel on Climate Change has increasingly adopted decision-making under deep uncertainty frameworks to better integrate low-confidence but policy-relevant information into assessments.[77] These approaches emphasise resilience, flexibility and iterative learning over static optimisation.

In 2025, the Council focused its annual workshop on adaptation on the topic of navigating uncertainty in critical infrastructure-focused climate adaptation planning. The workshop, held on 8 April, provided international case studies of tools and techniques that can be used to help make decisions under uncertainty, and experiences, challenges and opportunities for this approach in the Irish context were discussed. A workshop report was published on the Council website[79] and the Council plans to commission further research in 2025 to promote greater adoption of relevant tools and techniques to support decision-making under climate uncertainty.

The key messages from the workshop include the following:

- The adaptive pathways approach to taking adaptation action offers a practical method for decision-making under uncertainty.
- Some of the greatest uncertainties identified included ensuring water supply in the context of changing rainfall intensities due to climate change, access to flood insurance and the unknown costs of adapting flood relief schemes to future climate impacts.
- Many workshop participants noted that, as funding support is needed to undertake longer term interventions, having a legal climate resilience obligation could assist in this regard and help to spur on actions. However, others felt that there is sufficient guidance and targets in place for climate change at the national and EU levels and that more clarity is needed rather than more regulation. This key issue needs to be teased out further.

4.7. Skills and community engagement for increased climate resilience

Ireland's population is expected to grow significantly over the coming decades, leading to an increasing demand for a skilled labour force across various economic sectors. This includes the need for professionals upskilled in adaptation and resilience, and the creation of new green jobs. To meet these challenges, it is essential to conduct analyses of skill gaps across sectors and create training and education opportunities.

The NAF highlights the urgent need for an evaluation of the key professional disciplines required to support climate adaptation in Ireland and a strategy to address shortfalls in terms of the number of experienced professionals and graduates.[2]

The diversity of skills required goes beyond traditional engineering or technical roles; effective implementation of adaptation measures demands skills in governance and economic fields such as community involvement, bioeconomy, finance and investment, and policymaking.

As identified in an Institute of Public Administration report,[80] Government departments are experiencing significant challenges in addressing critical skills gaps related to climate action, particularly in policy analysis, community engagement and specialised knowledge in areas such as modelling, energy, forestry, biodiversity, marine planning and terrestrial planning. To overcome these issues, recommendations include training to ensure that adaptation skills are integrated into key roles and increasing recruitment for climate action roles.

SAP lead departments and agencies should urgently conduct comprehensive skills and resource gap analyses to identify and address climate adaptation skills needs across all sectors, including in semi-state companies and the private sector. This should also be considered an iterative exercise, as skills needs and associated gaps will change and evolve over time. A fit-for-purpose skills and resource gap analysis will help increase adaptation competencies within departments and agencies.

The private sector is also responsible for implementing adaptation measures and building capacity in its operations, infrastructure and supply chains. Upskilling opportunities related to adaptation should be prioritised in career progression and induction processes. Green skills, such as environmental engineering, climate and biodiversity monitoring, risk assessments and geospatial analysis, and environmental economic skillsets will play increasingly important roles in planning and implementing adaptation actions and NBS.[81] It is also important to note the interconnected nature of building skills and practices that support both mitigation and adaptation actions for businesses, including efficiency measures such as material circularity (see Figure 1). SOLAS is the State agency that oversees the building of the Further Education and Training sector in Ireland. Its Green Skills 2030 Strategy[82] identifies a pipeline of skills for effective climate action. SOLAS can play an important role in supporting the provision of adaptation skills identified above.

Alongside a skilled workforce, an informed community is essential for building resilience. For instance, training provided to some coastal communities in dune restoration has helped build capacity, by raising awareness of the importance of protecting coastlines from flooding and erosion and equipping volunteers with the practical skills required to restore these natural barriers, together with increasing understanding of wider planning and environmental control needs.[83] Another example is the Sustainable Energy Communities initiative by the Sustainable Energy Authority of Ireland,[84] which provides support, educational resources and funding to help communities become more sustainable in their energy use.

When taking climate action, it is important that decision-making is informed by the knowledge of local communities and is rooted in scientific research and policymaking expertise. Access to reliable

information and structured dialogue are required to achieve this level of engagement with climate action. DCEE should prioritise integrating adaptation into its community engagement programmes, such as the Climate and Engagement Campaign[85] and the National Dialogue on Climate Action.[86] In addition, local authorities should increase adaptation education and awareness initiatives as part of their outreach efforts through public participation networks, to empower citizen and community participation in climate dialogues and decision-making processes.

4.8. Managing coastal change

Approximately 40% of Ireland's population lives within 5 km of the coastline,[87] and the Council has consistently highlighted the urgent need for a national, and ideally island-wide, coastal management strategy to address the growing risks from sea level rise, coastal erosion and coastal storm events, and increase the resilience of coastal communities.[24] In 2023, the Inter-Departmental Group on National Coastal Change Management Strategy scoping report[23] recommended the development of local and national coastal change management plans to provide the necessary framework to guide short-, medium- and long-term coastal management and investment decisions. The advancement of NBS, such as restoring dunes, planting vegetation and stabilising coastlines, as sustainable and multi-benefit approaches to managing erosion and flooding risk, was also recommended. DHLGH has been leading the work programme to progress the recommended policy framework through the Inter-Departmental Steering Group, but there is no clear timeline for delivery.

In the UK, shoreline management plans[88] have been in place since at least 2012 to help deliver the ambitions of the UK National Flood and Erosion Risk Management Strategy. These set out a planned approach to managing flood and coastal erosion risk around the coast of England to 2105, with actions for the short term (0–20 years), medium term (20–50 years) and long term (50–100 years). As living plans, they are regularly updated by coastal groups, ensuring an integrated approach to coastal zone management and helping to guide investment decisions, such as construction and maintenance of sea defences, creation of coastal habitats and implementation of adaptation plans. The shoreline management plans provide an evidence-based management approach for each section of the coastline and, crucially, are developed in consultation with coastal communities. The management approaches employed align with those recommended in Ireland's 2023 scoping report, including:

- holding the line (maintaining or upgrading protection to hold the shoreline in the same position),
- no active intervention (encouraging a more natural coastline with consideration of adaptation to manage flood risk and erosion),
- managed realignment (changing the shoreline position in a controlled way to slow erosion or create areas of habitat to help manage flooding),
- advancing the line (actively moving shoreline defences seaward).

The fragmented management of Ireland's coast[89] is a persistent challenge that is exacerbated by policy objectives that do not align with each other,[90] increasing the risks of unsustainable management of coastal resources and the vulnerability of coastal communities. The Council welcomes the Programme for Government 2025[91] commitment to advancing the National Coastal Change Management Strategy and initiating three pathfinder schemes in selected coastal areas; however, it is concerned that there is no timeline to conclude this body of work. A more robust and adaptive governance approach, with increased integration between national, regional and local levels, is now urgently required to address the growing risks from sea level rise, coastal erosion and coastal storm events. The Inter-Departmental Group on National Coastal Change should develop

a comprehensive national programme of coastal management measures to protect and preserve coastal areas at the local and regional scales. This programme should identify, assess and prioritise the implementation of these measures, and should in particular address the problems of present and likely future coastal erosion of vulnerable coastal areas.

4.9. Biodiversity

Biodiverse ecosystems and landscapes remain key to providing greater resilience to climate change and extreme climate events, and to improving water, soil and air quality across ecosystems and landscapes. Biodiversity and ecosystems are also under threat from climate change and are included in the risk register of the NCCRA as one of the systems most vulnerable to climate change. Significant risks are identified to freshwater systems, peatlands, coasts, forests and terrestrial ecosystems. Other systems included in the risk register, such as food production and supply chain, and marine and coastal ecosystems, stand to be further impacted by climate risks to biodiversity and ecosystems.

The Adaptation Scorecard has consistently identified a lack of governance structures for effective coordination, capacity, funding and programmes for climate adaptation and for overseeing implementation of actions in the Biodiversity Sectoral Adaptation Plan. This has resulted in limited understanding and assessment of the vulnerabilities of ecosystems and species to climate change and the risks it poses to biodiversity. This includes a lack of adequate understanding of the impact of climate change on species distributions, the loss and damage to ecosystems, and the threats posed by invasive species and pests. In addition, the Adaptation Scorecard identified limited actions being undertaken to address these risks.

With the National Nature Restoration Plan to be developed by 1 September 2026, the Biodiversity Sectoral Adaptation Plan to be developed by Q3 2025 and the fourth National Biodiversity Action Plan (2023–2030) under implementation, it is a critical time to ensure the adequate resourcing of NPWS, to accelerate efforts to restore natural and semi-natural ecosystems and to protect and expand these ecosystems. While the increased investment in Budget 2025 is a welcome step, with €78 million allocated to NPWS in 2025, an increase of 25% compared with 2024, further substantial financing is needed for the actions necessary to restore Ireland's existing protected areas and to expand the network.

As with climate adaptation, responsibilities for species and ecosystem protection and restoration are spread across departments, and this requires strong integration and mainstreaming of biodiversity in other relevant policies, plans and programmes. Agri-environment schemes dominate biodiversity-related expenditure in Ireland, and enhanced incentives and supports are needed over the long term to ensure the expanded uptake of biodiversity-friendly agricultural practices and sustainable food production systems and to discourage monocultures in agriculture and forestry systems.

NPWS should establish a climate action unit and ensure, with the support of DPENDR and DHLGH, that it is adequately staffed and has a sufficient budget to oversee the effective implementation and coordination of the fourth National Biodiversity Action Plan, the Biodiversity Sectoral Adaptation Plan and the National Nature Restoration Plan. At the local level, it is further recommended that local authority biodiversity officers collaborate closely with local authority climate action teams to promote actions that benefit both biodiversity and resilience and avoid duplication of resources. Initiatives should include joint awareness and education programmes on biodiversity and resilience, encourage individuals to participate in biodiversity and citizen science projects, and provide support for individuals and communities to take action on NBS and make private and public spaces more biodiversity-friendly and climate resilient.

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