Rialtas na hÉireann
Government of Ireland

National Adaptation Framework

Planning for a Climate Resilient Ireland

2024

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Message from An Taoiseach

In recent years, Ireland has been working hard to mitigate climate change through reducing our greenhouse gas emissions and to position ourselves to take full advantage of a low-carbon future. This remains a core focus for this Government. However, even if our mitigation efforts succeed, the climate changes we are experiencing will continue.

Our measures to reduce harmful emissions, together with those of our partners in the EU and across the globe, will help limit the impacts of climate change, but we will continue to experience changes in rainfall patterns, rising sea levels, and more frequent and more intense weather events. We must adapt to the changes we are already experiencing and prepare for the changes we know are in store.

2023 was the warmest year on record, with the hottest June and wettest July in Ireland since records began. Extreme weather events are predicted to become more frequent and more intense over the coming years, impacting so many aspects of our society and of our economy.

Our understanding of climate change is improving. Today we are better able to attribute the impacts of climate change in making individual weather events more dangerous and more extreme. An NUI Maynooth study has shown that the rainfall event that caused extensive flooding in Midleton in October 2023 was 13% more intense due to the impact of climate change.

We also know that other slow-onset climate change, such as increasing average temperatures, changing seasonal weather patterns and rising sea levels will bring additional changes to Ireland over the medium to longer term, posing new challenges and demands. Successfully adapting to these emerging realities and building resilience to the threats they pose will be key to safeguarding Ireland’s economic, social and environmental wellbeing.

Our approach to this will be collaborative, working with sectors and communities to identify and lower risk. We will do it in a way that is fair, protecting those most vulnerable and least able to adapt to the impacts of climate change. We will also ensure that our efforts will lead to positive change, help to build resilience across Ireland and leave us well positioned to thrive in a changing world.

Ireland's National Adaptation Framework provides the strategic guidance and collaborative framework needed to do this. By investing in adaptation now, we can better protect our communities and our environment, strengthen our economy, and secure a truly sustainable future for generations to come.

Simon Harris TD

An Taoiseach

Minister's Foreword

Reports from the World Meteorological Organisation (WMO) and Intergovernmental Panel on Climate Change (IPCC) have reinforced the urgent need for greater action on climate adaptation globally. 2023 was the year with the highest average global temperatures on record. Europe experienced unprecedented regional temperature records during the summer. The alarming rise in temperatures fuelled wildfires across multiple European territories, resulting in tragic loss of life and extensive devastation. Ireland is also experiencing noticeable changes, including rising temperatures, shifting rainfall patterns, and more frequent extreme weather events.

The science now shows that climate change is making these events more dangerous and more intense. While global efforts to reduce greenhouse gas emissions are key to reducing the scale of the impacts of climate change there is a now a clear acceptance that we will also need to implement adaptation measures now and well into the future to build climate resilience and to minimise the impacts of climate change to our society and economy.

This statutory National Adaptation Framework (NAF) sets out the national strategy to reduce Ireland's vulnerability to these impacts. The role of key sectors including local government is set out in the context of how Ireland can develop climate resilience, while ensuring better coordination of adaptation actions across Government Departments and Agencies. This cooperation will be key in ensuring the success of our adaptation policies. It is essential that this whole-of-government approach which has been adopted for mitigation in our Climate Action Plan is also expanded to include adaptation.

The NAF also recognises that adaptation actions will be required by all of society, including the private sector and individual citizens. The NAF also aims to further develop the enabling environment for adaptation by encouraging dialogue, improving the availability of high-quality adaptation information and supporting adaptation research in key areas. This will build on progress to date and ensure that we move towards more and faster implementation of adaptation measures.

Eamon Ryan TD

Minister for the Environment, Climate and Communications

Acknowledgments

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Glossary

Adaptation: a change in natural or human systems in response to the impacts of climate change. These changes moderate harm or exploit beneficial opportunities and can be in response to actual or expected impacts.

Adaptive capacity: describes the ability of a sector to design or implement effective adaptation measures, using information on possible future climate change and extreme weather to moderate potential damage, take advantage of opportunities or to cope with the consequences.

Baseline: a baseline is a state against which a change is measured. For example, a ‘current baseline’ is made up of observable, present-day conditions.

Capacity: the combination of all the strengths and resources available within a community, society or organisation which can reduce the level of risk, or the effects of a disaster. It can also be described as capability.

Capacity building: in the context of climate change, capacity building describes developing the right skills and capabilities to help countries adapt to climate change. This also includes helping them to mitigate their greenhouse gas emissions.

Cleaner energy: energy sources and technologies that produce minimal environmental pollution and greenhouse gas emissions, promoting a more sustainable and eco-friendly energy supply.

Climate: the climate can be described simply as the ‘average weather’, typically looked at over a period of 30 years. It can include temperature, rainfall, snow cover, or any other weather characteristic.

Climate change: refers to a change in the state of the climate, which can be identified by changes in average climate characteristics which persist for an extended period, typically decades or longer.

Climate change scenario: a plausible description of the change in climate by a certain time in the future. These scenarios are developed using models of the Earth’s climate. Climate models and are based upon scientific understanding of the way that the land, ocean and atmosphere interact and their responses to factors that can influence climate in the future, such as greenhouse gas emissions.

Confidence: in a scientific context, confidence describes the extent to which the findings of an assessment are considered valid, based on the type, amount, quality, and consistency of evidence.

Extreme weather: includes unusual, severe or unseasonal weather or weather at the extremes of the range of weather observed in the past.

Greenhouse gases (GHG): a number of gases whose presence in the atmosphere traps energy radiated by the Earth; this is called the greenhouse effect. These gases can be produced through natural or human processes. Carbon dioxide is the most important greenhouse gas. Other greenhouse gases are methane, fluorinated gases, ozone and nitrous oxide.

Hazard: a situation or event which could cause harm. A hazard does not necessarily cause harm.

Impact: in the context of climate change, an effect of climate change (e.g., flooding, rails buckling, etc.).

Likelihood: the chance of an event or outcome occurring, usually expressed as a probability.

Maladaptation: actions that may lead to increased risk of adverse climate-related outcomes, including via increased GHG emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future. Most often, maladaptation is an unintended consequence.

Mitigation: describes action to reduce the likelihood of an event occurring or reduce the impact if it does occur. This can include reducing the causes of climate change (e.g., emissions of greenhouse gases) as well as reducing future risks associated with climate change.

Model: is a representation of how a system works and can be used to understand how the system will respond to inputs and other changes.

Planned adaptation: the result of a deliberate policy decision and most likely includes action that is required to return to, maintain, or achieve, a desired state.

Projection: any plausible description of the future and the pathway that leads to it. A specific interpretation of a ‘climate projection,’ refers to an estimate of future climate developed using models of the Earth’s climate. Projections are not predictions. Projections include assumptions, for example, on future socio-economic and technological developments, which might or might not happen. They therefore come with some uncertainties.

Radiative Forcing: is the net change in the energy balance of the Earth system due to some imposed perturbation. It is usually expressed in watts per square meter averaged over a particular time period and quantifies the energy imbalance that occurs when the imposed change takes place.

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.

Risk: combines the chance that an event will occur with how large its impact could be, in social, economic or environmental terms. For example: the costs of damage, number of people affected, or areas of land affected by a specific climate effect.

Risk Assessment: is an analysis of risks and their impacts to provide information for decision making. Often, risk assessment will consider a particular impacted party, like a building or population. The process usually includes identifying hazards which could have an impact; and assessing the likelihoods and severities of impacts.

Risk Management: putting in place plans to avoid unacceptable consequences of risks.

Scenario: is a plausible description of a possible future state of the world. These use specific assumptions on how aspects of the world might change e.g., economies, social trends, changes in technology, environmental changes, etc., based upon the best understanding available.

Sensitivity: the degree to which a system is affected, either adversely or beneficially, by climate variability or change.

Severe weather: refers to any dangerous meteorological phenomena with the potential to cause damage, serious social disruption, or loss of life.

Sustainable agriculture: an approach to farming that aims to meet current food production needs while preserving natural resources and ensuring the ability of future generations to meet their own needs.

Acronyms

CAP	Climate Action Plan
CCA	Climate Change Adaptation
CCAC	Climate Change Advisory Council
CER	Critical Entities Resilient Directive
CARO	Climate Action Regional Offices
CSRD	Corporate Sustainability Reporting Directive
DAFM	Department of Agriculture, Food and the Marine
DECC	Department of the Environment, Climate and Communications
DHLGH	Department of Housing, Local Government and Heritage
DPENDR	Department of Public Expenditure, NDP Delivery and Reform
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DOH	Department of Health
DOT	Department of Transport
EEA	European Environment Agency
EPA	Environmental Protection Agency
EUCRA	European Climate Risk Assessment
FSB	Financial Stability Board
GCM	Global Climate Models
GDP	Gross Domestic Product
GHG	Greenhouse Gases
HSE	Health Service Executive
ICIP	Climate Information Platform for Ireland
IFRS	International Financial Reporting Standards
IPCC	Intergovernmental Panel on Climate Change
ISSB	International Sustainability Standards Board

LA	Local Authority
LACAPs	Local Authority Climate Action Plans
MaREI	Centre for Marine and Renewable Energy
NAF	National Adaptation Framework
NCCAF	National Climate Change Adaptation Framework
NCCRA	National Climate Change Risk Assessment
NDCA	National Dialogue on Climate Action
NDFEM	National Directorate for Fire and Emergency Management
NECG	National Emergency Coordination Group
NFCS	National Framework for Climate Services
NGO	Non-Governmental Organisation
OPW	Office of Public Works
RCM	Regional Climate Models
RCP	Representative Concentration Pathways
SAP	Sectoral Adaptation Plans
SDGs	Sustainable Development Goals
TCFD	Task Force on Climate-Related Financial Disclosures
UNFCC	United Nations Framework Convention on Climate Change
YPCCC	Yale University's Programme on Climate Change Communications

1 Introduction

Climate change presents one of the most complex challenges of our time, with discernible impacts already evident. Recent years have seen erratic weather patterns, exemplified by the extended wet periods in Ireland in 2023 and 2024, adversely affecting agricultural yields and harvests, underscoring the urgent need for proactive measures to reduce or remove its effects. According to the Sixth Assessment Report (AR6[1]) of the Intergovernmental Panel on Climate Change (IPCC), it is clear that human actions, such as the emission of greenhouse gases (GHG), have been the primary cause of global warming since the mid-20th century. Ireland's climate is already changing, temperatures are increasing, sea levels are rising, and patterns of precipitation are changing.

Recent experiences of extreme weather such as the fodder crisis of 2023, the flooding of Midleton in October 2023, heatwaves of 2023 and 2022, and windstorms of 2024 (Kathleen), 2022 (Eunice) and 2021 (Barra) highlight the wide range of potential impacts of Ireland's changing climate. Climate change is projected to continue and intensify with diverse and wide-ranging impacts on Ireland's environment, society, and economic development, including on managed and natural ecosystems, water resources, agriculture and food security, human health, socio-political cohesion, and coastal zones (ICCA[2]). GHGs such as carbon dioxide remain in the atmosphere for thousands of years. As a result, due to past human activities and even if the world decarbonises rapidly, we are now locked into a level of unavoidable climate change. Adaptation to these impacts is urgently required and will need to continue now and well into the future. To build Ireland's resilience to these inevitable impacts and to better navigate the challenges posed by climate change, a proactive and co-ordinated approach to adaptation is essential to minimise the future impact on Ireland.

Ireland published its first statutory National Adaptation Framework (NAF) in 2018, a comprehensive plan required under the Climate Action and Low Carbon Development Act of 2015 (the Climate Act) subsequently amended in 2021. The NAF aims to create a unified approach involving both government and society to adapt to climate change. It outlines how various sectors and local authorities can implement adaptation measures to minimise Ireland's vulnerability to climate change's adverse effects while taking advantage of any beneficial impacts. The NAF emphasises the importance of integrating adaptation strategies into all levels of policy making, infrastructure development, and local planning. This

[1] IPCC Assessment Reports cover the full scientific, technical, and socio-economic assessment of climate change. Work on the AR6 spans across several years with the Working Group 1 contribution published in August 2021 and the Synthesis Report in March 2023.

[2] EPA (2024)

approach not only addresses immediate climate challenges but also promotes long-term sustainability. The first NAF developed as part of a long term, legally mandated, and iterative process that aims to ensure that Ireland is prepared for the likely impacts of climate change. Under the Climate Act, the NAF is subject to review every five years.

Following the statutory review of the NAF undertaken in 2022, which identified evolving policies, increased knowledge about climate change, and the noticeable rise in both the frequency and severity of climate impacts, a new NAF has been developed. This new NAF introduces a broader set of guiding principles, emphasising the urgency for more intelligent, rapid, and far-reaching adaptation strategies. It advocates for a pathway planning approach, which considers a variety of potential future warming and impact scenarios, to ensure flexible and effective adaptation measures. The 2024 NAF moves towards an outcomes-based strategy to better monitor and evaluate progress in enhancing the resilience of infrastructure, ecosystems, and society at large against climate change. This chapter establishes the context for the new NAF by introducing the concept of climate adaptation and other related concepts and outlining the key progress made since 2018 in national adaptation.

1.1 Climate Change Adaptation

As illustrated in Figure 1, responding to the challenges posed by climate change involves a two-pronged approach: reducing emissions of and stabilising levels of atmospheric GHGs (mitigation) and the development of proactive measures and strategies to anticipate, prepare for, and respond to changing climate conditions and associated impacts (adaptation).

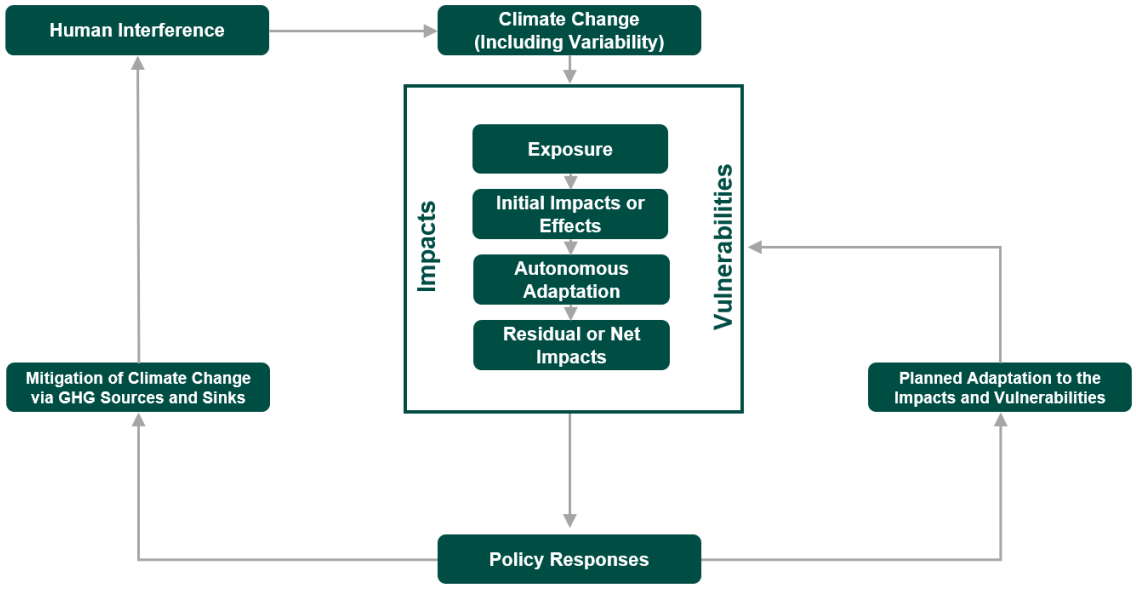

Figure 1. Mitigation and Adaptation Responses to Climate Change (IPCC, 2001)

Adaptation encompasses a wide range of actions aimed at reducing vulnerabilities, enhancing resilience, and safeguarding communities, ecosystems, and economies against the adverse effects of climate change. Adaptation actions may include actions that build adaptive capacity (e.g., knowledge creation and sharing information, creating supportive institutional frameworks), actions that establish management systems and supportive mechanisms (e.g., better land management planning, climate risk assessment, insurance mechanisms) or adaptation actions implemented on the ground (physical infrastructure and ecosystem-based measures).

Box 1

Adaptation definition: in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities; In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects; (IPCC, 2021)**.**

To ensure the success of climate action, it is essential that both adaptation and mitigation measures are aligned and coordinated. An integrated approach to climate action recognises the resource efficiency inherent in addressing adaptation and mitigation challenges simultaneously. For instance, bog restoration projects (e.g., The Living Bog project[3]), offer climate change mitigation benefits by stemming GHG emissions and bring adaptation benefits in helping alleviate flood problems and maintaining important biodiversity under a changing climate[4]. This synergy not only maximises the impact of climate-related investments, but also helps avoid potential trade-offs between the two strategies. Furthermore, acknowledging the mutual benefits of adaptation and mitigation efforts can encourage investment in local, nature-based solutions. These solutions aim to enhance the ability of local ecosystems to adapt to changes while also contributing to efforts to reduce emissions. Ultimately, an integrated approach to climate adaptation and mitigation is pivotal in fostering long-term sustainability, ensuring that climate actions contribute to a resilient and low-carbon future while delivering tangible benefits for communities and ecosystems.

[3] The Living Bog Project (2023)

[4] IUCN (2009)

Box 2

Climate adaptation measures are being taken all over the world and Ireland can learn valuable lessons from these approaches. For example, Copenhagen's climate response shows a holistic approach and includes adaptation and transformation to rethink urban development, creating a more resilient and liveable city. A sample of examples is outlined below that demonstrate the city's holistic and transformational adaptation approach which aims to employ adaptation actions and technologies to enhance urban living and catalyse green growth[5]:

- **Climate resilient buildings: Denmark's architecture and design traditionally considers the surrounding environment. The national building code has been updated to support the development of climate resilient buildings based on lessons learned from previous extreme weather events. For example, the Søpassagen residential buildings in Copenhagen are equipped to withstand heavy rainwater whilst being sustainable and energy efficient - leveraging solar panels and rainwater collection and reuse capabilities.**

- **Integrated planning for adaptation: Danish cities utilise an integrated approach for addressing climate-related challenges and urbanisation. For example, the Sankt Jørgens Lake in Copenhagen is expected to play an important role in flood prevention by lowering the water table to enable the lake to act as a reservoir coupled with a new green area to support flood management and recreation.**

- **Coastal protection: Denmark has a strong tradition for public-private collaboration on the management and protection of its coastline. One of the key Danish climate adaptation projects is located south of Copenhagen where a new dike has been built behind an old dike to protect city areas, urban infrastructure and nature whilst also creating a coastal path on the old dike for recreational purposes.**

- **Flood risk management: Denmark has a strong focus on establishing links between early warning systems and flood management. For example, combining flow measurements with automated drainage systems, pump stations and lock systems to prevent flooding in vulnerable areas. In Copenhagen, storm water solutions with a variety of purposes are implemented to both manage storm water and for alternative purposes during dry weather, such as recreational activities.**

[5] Confederation of Danish Industry

Figure 2 Copenhagen's coastal protection solution – constructing a new dike behind an older dike to protect infrastructure and nature whilst providing a coastal path for recreation (Image: Danish Nature Agency/Martin Nielsen sourced from the Confederation of Danish Industry)

1.1.1 Maladaptation

On a global basis, the level of adaptation is increasing across all sectors globally. However, the level of maladaptation is also increasing. Maladaptation refers to actions or strategies that, while intended to address the challenges posed by climate change, inadvertently exacerbate the problem, or create new vulnerabilities. This can occur when adaptation measures are poorly planned, misaligned with the local conditions, or fail to account for long-term consequences (e.g., poorly designed and inappropriately positioned coastal protection/defence structure). Careful planning and consideration of potential unintended consequences are essential to avoid maladaptive responses to climate change. An illustrative example of maladaptation is presented in Box 3 below.

Box 3

Across Europe, rising temperatures, combined with an ageing population and increasing urbanisation, mean that the population is becoming more vulnerable to heat-stress resulting in an increasing demand for cooling in buildings and the widespread use of air conditioning. While intended to address exposure to heat-related risk, the use of mechanical cooling such as air conditioning can lead to higher electricity consumption, exacerbate urban heat island effects, and potentially result in increased CO_2 emissions, depending on the energy source used for electricity generation.

1.1.2 Key concepts

Adaptation and adaptation planning, like most complex policy areas, is supported by a number of key concepts and terminology. These will be used regularly throughout this

document. In order to support a nationally consistent approach to adaptation across all relevant sectors and to improve overall familiarity with some of these concepts, a number of key definitions relevant to adaptation and adaptation planning are presented below.

- **Climate resilience:** The capacity of a system, whether physical, social, or ecological, to absorb and respond to climate change and, by implementing effective adaptation planning and sustainable development (including governance and institutional design), to reduce the negative climate impacts while also taking advantage of any positive outcomes. (NASC, 2018).
- **Just Resilience:** How different groups of society are affected by climate change impacts and how benefits and burdens of adaptation responses are distributed across different groups and how different groups experience fair and transparent processes with a fair distribution of political power and participation in policymaking (EEA, 2022).
- **Incremental Adaptation:** Incremental measures involve modifications to existing systems and practices, often building upon current capacities and technologies. While Incremental adaptation measures offer immediate benefits, they often need to be combined with other incremental or even transformative adaptation measures to address more severe and complex climate impacts and associated vulnerabilities. (IPCC, 2023)
- **Transformative Adaptation:** Calls for fundamental changes that reshape systems, policies, and practices to effectively address underlying vulnerabilities. This approach is aligned with the need to navigate unpredictable and potentially disruptive impacts of climate change. While they may pose challenges, such as higher costs and potential disruptions, they are crucial for enhancing long-term resilience and ensuring sustainable adaptation to climate change, particularly when addressing systemic risks and striving for comprehensive just and lasting solutions. (IPCC, 2023)

1.1.3 Tipping Points

The cumulative impact of projected climate changes has the potential to result in abrupt and/or irreversible changes in the climate system (so-called tipping points). The risk of transgressing these tipping points increases with increased global warming. Such tipping elements include cryosphere components, including the continental ice sheets on Antarctica, biosphere components such as the Amazon rainforest, coral reefs and boreal forests as well as large-scale atmospheric and ocean circulation patterns such as the Atlantic Meridional

Overturning Circulation (AMOC). The IPCC AR6[6] outlines the following observations in relation to tipping point thresholds:

- At warming levels of between 2-3°C the majority of the Greenland and West Antarctic ice sheets will be irreversibly lost over multiple millennia resulting in sea level rise. Higher global surface temperatures increase the probability and rate of ice mass loss.
- In relation to the AMOC, there is *medium confidence* that it will not collapse abruptly before 2100, but if it did occur it would *very likely* lead to abrupt shifts in regional weather patterns and large impacts of human and natural ecosystems.

Climate change mitigation, aimed at reducing and stabilising GHG emissions, is the most effective strategy for preventing the crossing of critical environmental tipping points, as reliance solely on adaptation may prove insufficient in averting irreversible ecological consequences.

1.2 National adaptation progress

Ireland's overarching climate goal is to transition to a low carbon, climate resilient and environmentally sustainable economy by 2050. Since the publication of the NAF in 2018, there have been significant developments in national climate action and climate adaptation policy. These include the 2021 amendment of the Climate Action and Low Carbon Development Act, the requirement for and publication of annual Climate Action Plans and the review of the 2018 NAF as discussed below. These developments have been accompanied by advances in climate research on a range of topics such as climate modelling. The availability of climate services and climate resources at national level has also been enhanced. In addition, there has been a growing focus on involving civil society in climate governance while the need for substantial new public financing mechanisms for climate action has also become more evident. A number of the most important developments since 2018 are set out in the following subsections.

1.2.1 Climate Action and Low Carbon Development Acts 2015 – 2021

Ireland has formalised its commitment to climate action through the enactment of the Climate Action and Low Carbon Development Acts 2015 to 2021 (Climate Act). The Climate Act commits the Government to achieving a climate resilient, biodiversity rich,

[6] European Geoscience Union(2021)

environmentally sustainable and climate neutral economy by 2050.[7] Furthermore, the Climate Act sets forth stringent emission reduction goals, aiming for a 51% reduction by 2030 and achieving net-zero by 2050. The Act also requires the development of a National Adaptation Framework (NAF) approved by Government and its review every five years[8]. The 2021 amendments to the Climate Act reaffirmed the status of the NAF with new provisions focused on progressing adaptation at a national, sectoral and local level.

From a sectoral adaptation perspective, Sections 6 and 7 of the Climate Act establish the requirements for the preparation of Sectoral Adaptation Plans (SAPs).[9] The 2021 amendments introduced new provisions to streamline the development and submission of future SAPs. Under the Climate Act, the Government may request two or more Ministers of Government to jointly make and submit a SAP (referred to as a "joint sectoral adaptation plan").

In terms of local adaptation, the amendments made to the Climate Act strengthened the role of Local Authorities in climate action. Of particular importance is the requirement for LAs to develop and implement Local Authority Climate Action Plans (LACAPs), which include adaptation measures, by Q1 2024 and every 5 years subsequently.

1.2.2 Sectoral and Local Planning

Ensuring Ireland is resilient to the current and future impacts of climate change requires a coordinated response from all sectors and the establishment of effective local planning. This section examines national progress with regards to the development of Sectoral Adaptation Plans (SAPs) and local resourcing and capacity building towards an effective and robust approach to adaptation in Ireland.

1.2.2.1 Sectoral Adaptation Planning

The Climate Act sets out the requirements for the preparation of Sectoral Adaptation Plans (SAPs). The 12 priority sectors identified in the 2018 NAF were grouped into 9 SAPs and clustered into four themes covering natural and cultural capital, critical infrastructure, water resource and flood risk management, and public health. This approach aims to provide a structured and systematic approach to sectoral developments.

[7] Government of Ireland (2021)

[8] Government of Ireland (2021)

[9] Government of Ireland (2021)

Table 1: SAPs and themes for 12 sectors identified in the 2018 NAF. Government Departments have been updated to reflect Departmental reconfigurations since 2018.

Theme	Sector Level	Government Department
Natural and Cultural Capital	Seafood	Department of Agriculture, Food, and the Marine
	Agriculture	
	Forestry	
	Biodiversity	Department of Housing, Local Government and Heritage
	Built and Archaeological Heritage	
Critical Infrastructure	Transport Infrastructure	Department of Transport
	Electricity and Gas Networks	Department of the Environment, Climate, and Communications
	Communication Networks	
Water Resource and Flood Risk Management	Flood Risk Management	Office of Public Works
	Water Quality	Department of Housing, Local Government and Heritage
	Water Services Infrastructure	
Public Health	Health	Department of Health

To support key national sectors in planning for climate change adaptation and according to the requirements of the NAF (2018), sectoral planning guidelines were developed as part of the Irish Climate Information Platform, Climate Ireland (ICIP) project[10]. The guidelines aim to ensure that a coherent and consistent approach to adaptation planning is adopted at national and local levels. Since the guidelines' publication in May 2018, they have been successfully implemented by Departments to develop SAPs.

1.2.2.2 Individual CCAC scorecard SAP progress

The CCAC annually assesses progress of both SAPs and Local Adaptation Strategies, and NAF implementation, and publishes a sectoral Adaptation Scorecard. Progress made by sectors in their climate change adaptation efforts in the past year as per the CCAC annual scorecard is summarised in Appendix 5. This shows clearly that good progress has been made across sectors like Transport, Flood Risk, Water, and Built and Archaeological Heritage, with mixed and inconsistent progress evident in other areas.

[10] DECC, (2018)

1.2.2.3 Local Government Adaptation Planning

In addition to the individual roles of specific sectors and the progress described above, adaptation planning at the local level, including the planning of Local Authorities (LAs), has a key role to play in implementing effective local responses to climate change across Ireland.

LAs are strategically placed to progress local adaptation measures given their role within local communities, their extensive knowledge of the natural and built environments within their functional areas, and their established delivery of practical adaptation measures. As summarised below, LAs have been proactive in developing their adaptation strategies, educating their staff on climate change impacts, and engaging the public. They have also played a crucial role in supporting adaptation initiatives across various sectors.

1.2.2.4 Local Authority Adaptation Strategies

The NAF (2018) required LAs to prepare adaptation strategies for their administrative areas to reduce the vulnerability of the state to the negative effects of climate change and to avail of any positive effects that may occur. LA adaptation strategy development was completed in 2018. The strategies identified the key risks faced across the Local Authority jurisdiction and the approach being taken to address these risks and build climate resilience for the future. This work was key in the subsequent development of Local Authority Climate Action Plans (LACAPs) which were required under the Climate Act and these LACAPs have now been adopted by all 31 local authorities.

1.2.2.5 Resourcing and capacity building

In the last five years, various local authorities have shown significant progress in climate change adaptation, particularly in staffing, training, and resourcing. Four Climate Action Regional Offices (CAROs) have played a key role, resulting in a 34% completion rate of actions from the LA adaptation strategies, up from 19% in 2022, as per the Local Authority Annual Progress Reports submitted by the CAROs. Training programs such as the Local Authority Climate Action Training Programme, and funding for a Climate Action Coordinator and a Climate Action Officer in each LA have been implemented, demonstrating the government's commitment to local climate action. Additionally, tools like the Weather Impact Register (WIRE App) and community engagement projects on adaptation and promoting nature-based solutions, e.g., the Sand Dune Awareness campaign in the Atlantic Seaboard North CARO, have been developed to enhance adaptation efforts and bring in engagement from local residents.

1.2.2.6 Local Authority Staffing and Training

LAs must be equipped with the appropriate skills and resources to plan, develop and implement climate adaptation measures.

The implementation of Climate Action Plan 2019, Action 150, led to the development of a climate action training programme for all 29,000 local authority staff and 949 elected members. This programme, funded by DECC, has received full endorsement from relevant associations and has had a strong adaptation focus. Training has covered climate action leadership, general awareness, technical aspects, spatial planning, flood risk assessment, and more. Additional programmes are in development for various staff categories and specialised topics such as green procurement.

To increase LA resource capacity, DECC allocated €3.5 million of funding in 2022 to support staffing resources for Climate Action Officer and Climate Action Coordinator roles[11]. DECC allocated a further €5.5 million in funding for these posts in 2023 and related project costs. Furthermore, as part of the Community Climate Action Programme, €60 million from the Climate Action Fund has been allocated for investment into community climate action projects and initiatives, and capacity building over the next three years. Under the programme, €24 million is allocated to LAs to work with communities to build low carbon communities. 12% of this funding has been allocated to the engagement of a community climate action officer within each LA[12].

1.2.3 Climate Action Plan

The Climate Act requires the government to develop a Climate Action Plan (CAP), which puts into action the country's climate commitments. Updated annually, this plan is designed to be in harmony with the National Development Plan for the years 2021 to 2030. This Plan strategically integrates climate solutions into the core of social, political and economic development, with a strong emphasis on driving system-wide changes.

At the heart of this strategy is the understanding that essential systems, which govern aspects of life such as living conditions, construction, work, transportation, commerce, health, wellbeing, and food production, need to be fundamentally transformed to reach the Net Zero goals. The CAP calls for substantial shifts in local governance, public sector practices, industries, and key economic sectors to support the necessary transformation.

[11] Oireachtas (2023)

[12] Department of the Environment, Climate and Communications (2022)

CAPs have, since their inception, included key adaptation actions however the primary focus has been on mitigation. Adaptation is considered through sectoral actions and through a dedicated adaptation chapter which focuses on national adaptation priorities and priority cross-sectoral considerations.

In more recent years, CAP 23 and CAP24 include specific chapters on adaptation actions across a number of themes to support the implementation of the existing NAF and sectoral plans.

Adaptation actions in CAP23 for example are categorised under the following priority areas:

- Update National policy and NAF in line with the NAF review and legislation
- Climate resilience in flood risk management policies
- Climate resilience of coasts
- Climate data and availability and climate services
- Develop early warning systems
- Climate resilience of infrastructure (water, comms, electricity and gas networks)
- Climate resilience in health
- Improve awareness of need to adapt

Specific actions are included relevant to flood risk management from the Office of Public Works (OPW), Department of Housing, Local Government and Heritage (DHLGH), Geological Survey Ireland (GSI) and Met Éireann. These included the development of the National Flood Forecasting and Warning Service (NFFWS) [13] . implementation of actions from the flood risk sectoral adaptation plan by OPW, and development of groundwater flood maps by GSI as well as ongoing work across Government on coastal change management. A smaller number of adaptation actions are also mainstreamed into relevant mitigation policy chapters.

1.2.4 National Adaptation Framework Review

Under the Climate Act, the NAF must be reviewed at least once in every five-year period. This review process took place in 2022 with feedback from key Sectoral, Department and

[13] The NFFWS is chaired by the OPW. The operational Forecasting Centre is located in Met Éireann with further support in terms of its operation provided by the County and City Managers Associated (CCMA), Department of Agriculture, Food and the Marine and National Directorate of Fire and Emergency Management (NDFEM).

Agency Stakeholders in addition to a public consultation. The NAF review[14] considered key international, EU and national developments – including progress made on actions under the 2018 NAF, the IPCC reports, the 2021 EU Adaptation Strategy and the 2021 amendments to the Climate Act. The review resulted in a total of 33 recommendations for consideration within a new NAF. Key recommendations included improved alignment with the 2021 EU Adaptation Strategy, more effective management of cross-cutting and transboundary climate change impacts and risks, improved and better integration of national climate data into adaptation planning and a need for more emphasis on just resilience and mitigation co-benefits.

The review examined progress made on the 12 core actions under the 2018 NAF, including the development of SAPs, establishment and revision of governance structures at national and local level, the development of sectoral guidelines, and other actions aimed at improving the enabling environment for adaptation including those relating to Climate Ireland. Further details were provided regarding a number of key developments in adaptation policy since 2018.

1.2.5 National Adaptation Steering Committee

The National Adaptation Steering Committee (NASC), chaired by DECC, meets 4 times per annum and includes representation from key Sectors, other line departments including D/Taoiseach, D/Finance and DPENDR, CAROs, and other relevant Agencies. It provides a collaborative space to allow for the sharing of adaptation developments, progress, policy and research. It is also useful to inform members of developments at EU and UN level. Membership of the group has expanded significantly since 2018. The group remains the primary coordination group dealing exclusively with adaptation policy across Government.

1.2.6 Climate Services

Building the evidence base in terms of climate-related data and information resources is crucial to inform effective and targeted adaptation action. Since the publication of the 2018 NAF, there has been significant developments in the planning and delivery of climate services as outlined below.

Box 4

Climate services involve the provision of climate information in such a way as to assist decision-making. The service includes appropriate engagement from users

[14] Department of the Environment, Climate and Communication (2022)

and providers, is based on scientifically credible information and expertise, has an effective access mechanism and responds to user needs; (Hewitt et al., 2012).

1.2.6.1 National Framework for Climate Services

In June 2022, the Government agreed to establish a National Framework for Climate Services (NFCS[15]); a mechanism to coordinate, facilitate and strengthen the collaboration among climate information providers and users. The NFCS is co-ordinated by Met Éireann and aims to support the production of standardised and comparable climate services by the climate community in Ireland. These climate services will support climate adaptation through the provision of tailored information and services that ensure adaptation measures are targeted, leverage up-to-date resources and data, and avoid maladaptation.

1.2.6.2 Climate Ireland

Climate Ireland is the official National Adaptation Platform, serving as a key resource for adaptation-related information in Ireland. It aims to support climate adaptation planning by providing tailored climate and adaptation information, guidance, and tools for risk assessment. Managed by the Environmental Protection Agency (EPA) and initially developed by researchers at University College Cork and the National University of Ireland, Galway, Climate Ireland offers scientific advice, decision-making frameworks, and tools to aid adaptation efforts.

The platform regularly updates its resources to serve a broad audience, including decision-makers at local, regional, and sectoral levels, enhancing awareness and capacity in adaptation planning through workshops and seminars. The Climate Ireland Adaptation Network (CIAN) established by the EPA is aimed at sharing expertise and creating learning opportunities around adaptation in Ireland as well as improving the consistency of adaptation implementation. CIAN has in excess of 250 members and is growing. The first newsletter was issued in January 2024, and it will continue to be issued quarterly. The network held its inaugural seminar in October 2023 and a second annual seminar focused on the themes of uncertainty, risk management and risk assessment is currently being planned. The network encourages additional adaptation practitioners to join on an ongoing basis.

These developments emphasise Climate Ireland's role as a central hub for up-to-date climate information and tools, integral to Ireland's ongoing climate adaptation strategies.

[15] Available at: met.ie/NFCS

1.2.6.3 Irish Climate Change Assessment

The EPA Irish Climate Change Assessment (ICCA) Report provides an assessment of climate research and human activities in Ireland – synthesising the outcomes and findings from funded research.[16] Building on the scientific assessment provided by the IPCC AR6 report, this research improves the national understanding of climate change and develops the required analytical capacity and communication structures. The ICCA Report represents an opportunity for Ireland to assess national climate-related activities and link them to EU and international activities. This assessment of research provides a strong basis for informing mitigation and adaptation policies in Ireland, including the NAF and the Climate Action Plan. The ICCA is comprised of four volumes in addition to providing an overarching synthesis report:

- Volume 1: Science: Ireland in a changing world
- Volume 2: Achieving climate neutrality by 2050
- Volume 3: Being prepared for Ireland's future climate
- Volume 4: Realising the benefits of transition and transformation

Volume 3 is the most relevant to adaptation and covers the impacts we are likely to face and how we can prepare for these changes in an Irish context. It incorporates the latest projections from Ireland-specific climate modelling initiatives from Irish Centre for High End Computing (ICHEC) and Met Éireann, as well as impacts-modelling and social research into community resilience and wellbeing. The report covers a range of sectors, including biodiversity, critical infrastructure, health, and pays attention to the co-dependencies between them. It looks at a broad spectrum of research undertaken in Ireland on climate impacts, while also covering best practices in the IPCC's Sixth Assessment Report and the international literature.

The report provides knowledge on research and policy gaps in Ireland, on cross-cutting issues and concepts framing adaptation in Ireland, and on the practical steps required to build community involvement and participation in order to deliver a more climate-resilient Ireland. It, therefore, builds on the fundamental science basis covered in Volume 1, covering a very broad range of disciplines and topics, including the co-benefits and synergies with carbon neutrality measures addressed in Volume 2 and concepts such as transformative adaptation and just transitions further explored in Volume 4.

[16] EPA (2024)

1.2.6.4 National Climate Change Risk Assessment

To support the planning and implementation of targeted, relevant adaptation actions, CAP 2023 (Action AD/25/2) called for the development of Ireland's first National Climate Change Risk Assessment (NCCRA) by March 2025. Led by the EPA, the NCCRA is building on and advancing existing understanding of climate change risks for Ireland through the establishment of a structured, semi-quantitative risk assessment procedure to identify, evaluate, and prioritise climate change risks. On this basis, the NCCRA will set out the priority impacts of climate change for Ireland. This process will lay the groundwork for informed adaptation planning and action implementation, facilitating the development of tailored solutions to enhance Ireland's resilience against anticipated climate-related challenges. The NCCRA will also set out national and sectoral risk assessment criteria to ensure consistency in the estimation of risk within and across sectors.

1.2.7 Civil Society: Progress made on climate change engagement

In Ireland, there is a strong awareness and concern about climate change, with 85% of people expressing worry about its impact, with 37% being "very worried".[17] Nearly half, or 47%, believe climate change is already impacting people in Ireland, while 22% expect its harmful effects to manifest within the next decade.[18]

The importance of society's involvement in building climate resilience, whether over the short or long term, cannot be overstated. Everyone has a part to play in making Ireland more resilient to climate change. It's crucial to continue with effective mechanisms, including the National Dialogue on Climate Action as outlined below, that enable active engagement of civil society in our pursuit of climate resilience.

1.2.7.1 National Dialogue on Climate Action and Climate Conversations 2023

The Climate Conversations play a crucial role in the annual National Dialogue on Climate Action (NDCA) program.[19] In 2021, the inaugural Climate Conversations (CC21) were launched as part of the NDCA, engaging 3,800 individuals from the public and various community groups throughout Ireland. Building on the success of these initial discussions, the 2022 Climate Conversations (CC22) aimed to broaden stakeholder engagement. CC22 focused on reaching individuals not previously involved in climate discussions and those

[17] EPA (2024)

[18] EPA (2024)

[19] DECC (2022)

who might be most affected by the transition. Through an online consultation in 2022, CC22 successfully engaged 4,300 people across Ireland.

CC22 focused on gathering insights from the Irish public regarding adaptation to climate change. The survey revealed that the top three impacts of climate change recognised by the public in Ireland are extreme weather events (87%), river and coastal flooding (73%), and challenges to food production (71%). Regarding adaptation measures, an overwhelming 96% of respondents highlighted the importance of restoring natural habitats. Other significant adaptation strategies included ensuring that planning laws support sustainability (92%), promoting education and training on the issue (93%), and prioritising climate change in all government policies (89%). These findings indicate strong public support for comprehensive and nature-based solutions to climate change adaptation.

The Climate Action Plan 2023 emphasises the importance of reinforcing the mutual commitment between the Government and the Irish populace towards climate action. It underlines that adaptation measures need to be justifiable, effective, resilient, and result in fair outcomes aligning with well-defined and equitable national adaptation goals. Crucially, it's vital that the societal agreement—regarding what the state expects from its citizens in terms of adaptation and addressing climate risks—is established through transparent, inclusive, and equitable discussions. The Climate Conversation 2023 serves as a crucial platform for individuals to voice their opinions on climate action, its impact on their lives, and the policies they wish to see enacted. Additionally, the development of climate change storylines for Ireland by Met Éireann, especially those that consider low probability but high-impact scenarios, is intended to be a valuable tool for community engagement. These narratives, with their cross-sectoral implications, will help in testing adaptation strategies and conveying critical risks to a wide range of audiences. This initiative will significantly contribute to the refinement and development of future Climate Action Plans.

Since 2021, the National Dialogue on Climate Action (NDCA) has engaged nearly 12,000 members of the public through the Climate Conversations and nearly 1,000 stakeholders through workshops, focus groups, in-depth interviews, the National Climate Stakeholder Forum (NCSF), and National Youth Assembly on Climate (NYAC). It has supported the delivery of the EPA Climate Change in the Irish Mind (CCIM) study, which provides nationally representative data on the attitudes and behaviours to climate change of 4,000 members of the Irish public and, as of September 2023, has launched its second wave.

Following reviews in 2022 and 2023, a new multiyear framework will be rolled out that allows for relevant activities to be delivered on an annual basis and some on a multiyear basis. In adopting this approach, the NDCA will have a strong focus on action in 2024 under the

‘Climate Actions Work’ campaign, a new national engagement and communications campaign to support and encourage action on climate and community resilience over the coming year.

1.2.8 National research progress

In line with developments at a European level, Ireland has made strong progress in climate change research. Key actors involved in Ireland’s climate change-related research activities are represented in the Climate Research Coordination Group, which includes members from the Central Statistics Office, the Department of the Taoiseach, Met Éireann, the EPA and Science Foundation Ireland. National climate change research on impacts and adaptation is being progressed across four core areas:

- Observations, monitoring and analysis
- Modelling of future climate
- Impacts, risk and vulnerability assessment
- Adaptation information and responses

1.2.8.1 Observations, monitoring and analysis

In 2018, Ireland established a Global Climate Observing System (GCOS) National Committee, dedicated to guaranteeing the ongoing collection and provision of reliable observations and data on the climate system. This encompasses physical, chemical, and biological measurements across three key areas: the atmosphere, oceans, and land within Ireland. This initiative plays a crucial role in maintaining comprehensive climate records for the country, supporting efforts to monitor and understand climate variations and changes. The founding members of the Committee include Met Éireann, the Marine Institute and the EPA. The measurement and assessment of climate change is achieved through baseline and background measurements of essential climate variables (ECVs) – which include measurements of air temperature, precipitation, and sea level. The GCOS specifies 54 ECVs, of which 50 are identified as relevant to Ireland[20].

Responsibility for the measurement of ECVs lies primarily with Met Éireann – conducting the majority of atmospheric ECV measurement – with support from organisations such as the EPA, NUI Galway and DECC. Oceanic measurements fall within the remit of the Marine Institute, with support from Met Éireann, the OPW and NUI Galway, amongst others. Land surface measurements are undertaken largely by space agencies and the EPA. Hydrological

[20] Cámaro García et al. (2020)

and hydrogeological measurements are undertaken by the EPA, OPW, GSI, Waterways Ireland and the ESB. The EPA coordinates the national hydrometric monitoring programme, which is published on the EPA website[21].

1.2.8.2 Modelling of future climate

Climate projections for Ireland are being developed as part of the EC-Earth European consortium which was established to develop an improved fully coupled atmosphere-ocean-land-biosphere global climate model. The EC-Earth consortium for Ireland consists of Met Éireann and the Irish Centre for High End Computing (ICHEC).

ICHEC has completed runs using the EC-Earth climate model for CMIP6 – the Coupled Model intercomparison Project, organised under the World Climate Research Program to improve the understanding of past and future climate change. Since its inception, CMIP has formed an integral part of the IPCC Assessment Reports.

At a national level, the TRANSLATE project, led by Met Éireann, in partnership with ICHEC, University of Galway, and University College Cork – SFI Research Centre for Energy, Climate and Marine (MaREI) has produced the first standardised and bias corrected national climate projections for Ireland[22]. The projections are the most up to date, and highest resolution available to the Irish community. The TRANSLATE project's results and climate services are designed to be accessible and useful for stakeholders, including platforms like Climate Ireland, by providing standardised and bias-corrected national climate projections. This facilitates the incorporation of the latest climate science into practical, real-world solutions for climate adaptation, mitigation, and planning decisions across Ireland.

1.2.8.3 Impacts, risk, and vulnerability assessment

National research has been conducted to deepen the understanding of impacts, risk, and vulnerability. The EPA is responsible for coordinating environmental research in Ireland and facilitates this through the National Environmental Research Coordination Group (NERCG). The main purpose of the NERCG is to provide a cross-sectoral, national forum for the strategic coordination of environmental research in Ireland. The NERCG comprises relevant Public Organisations, including research funding organisations, policy making actors (i.e., Government Departments) and policy implementation actors (i.e., State Agencies). A full list of participating organisations is available on the NERCG Membership page.

[21] Cámaro García et al. (2020)

[22] Met Éireann (2023)

The National Climate Research Database contains information about research funded by the members of the NERCG and identifies 172 research projects funded under the 'Ireland's Future Climate, its Impacts, and Adaptation Options' and 'Being prepared for Ireland s future climate' themes since 2017 that contribute to the understanding of impacts, risk, and vulnerability within Ireland.

1.2.8.4 Adaptation information and responses

As discussed previously, Climate Ireland is the key information resource for sectoral and local level adaptation which is currently being updated to include national standardised climate projections by the EPA.

In addition, specific projects have been delivered to address climate adaptation needs in Ireland. For example, the EPA Research Report 'Climate Change Adaptation: Risks and Opportunities for Irish Businesses' identified material climate risks for Ireland's private sector which can be used to inform the development of business-level resilience and adaptation plans. MaREI's PCAS project (Policy Coherence in Adaptation Studies: Selecting and Using Indicators of Climate Resilience) funded by the EPA analysed international best practice and approaches to the development of climate adaptation indicators to identify a tailored set of relevant climate adaptation indicators for Ireland – 91 indicators were identified as priority[23].

1.2.9 Financing Adaptation: Progress and Initiatives

Given the large-scale changes required to ensure Ireland adapts to and is resilient to climate change, significant investment is required. Progress has been made at both EU and national level in terms of implementing funding mechanisms, policies, plans and strategies to support investment into climate-related activities. Progress at a national level is discussed below, including the implementation of the Climate Action Fund and Infrastructure, Climate and Nature Fund.

1.2.9.1 Climate Action Fund

The Climate Action Fund (CAF) was established as the main mechanism to provide assistance and financial support to projects that help Ireland achieve its climate and energy targets as part of the Climate Action Plan. The CAF aims to provide €500 million in government funding up to 2027 towards this aim, with DECC responsible for the Fund's implementation. In May 2022, Guidelines on Applying to the Payment of Financial Support from the Climate Action Fund[24] were published. The CAF releases a number of calls for

[23] EPA (2021)

[24] Department of the Environment, Climate and Communication (2022)

applications and the calls must vary to ensure the full objectives of the CAF are realised. This has thus far included calls focusing on specific sectors (such as electricity, transport, heat and agriculture) or specific areas (low carbon development, capacity building).

1.2.9.2 National Development Plan (2021-2030): Strategic Outcome 8 – Transition to a Climate-Neutral and Climate-Resilient Society

The national objective of transitioning by 2050 to a competitive, low-carbon, climate-resilient and environmentally sustainable economy and society will continue to influence future public capital investment choices. The revised National Development Plan (NDP) (2021-2030) provides a funding package of €165bn in resources available to all Departments to address capital priorities over the decade.[25] As part of the NDP Review, seven relevant climate and environmental outcomes were selected by the Department of Public Expenditure, NDP Delivery and Reform in consultation with DECC. These outcomes were considered to align with Government climate and environmental policy. Departments were required to perform a high-level, qualitative self-assessment to determine the potential impact every spending proposal put forward may have on each of these outcomes, one of which was climate adaptation.

Furthermore, the National Strategic Outcome 8 of the NDP refers to a "Transition to a Climate-Neutral and Climate-Resilient Society". To assist DECC with funding for its obligations under the CAP, to deliver the National Broadband Plan and in allocating the additional €5 billion from 10 years of Carbon Tax receipts, it will receive a total indicative allocation of €12.9 billion over the 2021-2030 period. In terms of Flood Risk Management, a key adaptation measure, investment of €186 million since 2018 has been provided, underpinning the commitment of the NDP to 2027 of €1 billion[26].

1.2.9.3 Ireland Strategic Investment Fund's Climate Investment Strategy

Through the Climate Investment Strategy, the Ireland Strategic Investment Fund (ISIF) aims to fund climate-positive initiatives by partnering with international investors with climate expertise to support Ireland's decarbonisation policies and has been developed with a view of supporting wider CAP implementation.[27] The approach is two-fold:

- To support sustainable infrastructural requirements of the Irish economy towards 2030 in key areas where carbon emissions are prevalent (as per the CAP).

[25] Government of Ireland (2021)

[26] Department of Public Expenditure, NDP Delivery and Reform (2021)

[27] Ireland Strategic Investment Fund (2022)

- To fund development of new technologies and business models that align with a low carbon economy towards 2050.

Overall, the Climate Investment Strategy plays a crucial role in guiding Ireland's investment decisions towards climate-friendly, sustainable projects that contribute to both environmental protection and economic development, which can be aligned with critical adaptation infrastructure needs. As outlined in ISIF's Climate Update (2023)[28] as part of the selection process for the Investment Strategy, it is committed to 1) reassessing current metrics and targets to become future-proofed, given the need for a radical emissions reduction; 2) aligning portfolio alignment metrics for the Irish portfolio and 3) developing more sector or industry expertise to allow for robust assessment of climate risk within companies, sectors and sub-sectors, in line with legislative requirements (EU Taxonomy guidelines, the Climate Action Plan and the Climate Act Carbon Budgeting provisions). Investments within this Strategy could be further aligned with specific adaptation infrastructure needs, informed by the NAF outlined in Chapter 2.

1.2.9.4 Infrastructure Guidelines

Until 2023, the Public Spending Code (PSC) acted as the framework setting out Ireland's value-for-money requirements for public investment projects. Under the PSC, economic appraisals must estimate and monetise a project's emissions – with the price of carbon recently being increased significantly by the Department of Public Expenditure, NDP Delivery and Reform (DPENDR)29. Climate considerations are now integrated into various stages over a project's lifecycle, such as at the Strategic Assessment and Preliminary Business Case stage as well as the Benefits Realisation Plan for the Final Business Case. Funded by the European Union, the OECD provided technical support to the Government to strengthen climate and environmental considerations in public infrastructure decision making. This work produced two reports in September 2023 that proposed recommendations and new approaches to integrate mitigation and adaptation considerations in the appraisal process under the PSC[30]. In March 2023, the Minister for Public Expenditure, NDP Delivery and Reform achieved government approval for a package of significant actions to enhance project delivery for the NDP. As part of these reforms, the

[28] Irish Strategic Investment Fund (2022)

[29] OECD (2023)

[30] OECD (2023)

PSC has been removed and replaced by a set of Infrastructure Guidelines[31] which build on the existing requirements that were in the PSC.

Climate and environmental performance is now an explicit appraisal element in the Preliminary Business Case stage of the project lifecycle. This includes both mitigation and adaptation and requires both an assessment of the impact of the project/programme on greenhouse gas emissions and the resilience of a project/programme to the impacts of climate change. The updated guidelines also require that information related to climate and environmental performance should be embedded within the proposed economic framework (Cost Benefit Analysis (CBA), Multi Criteria Analysis (MCA), Cost Effectiveness Analysis (CEA)) of an investment proposal.

1.2.9.5 Infrastructure, Climate and Nature Fund (2024)

As part of Budget 2024, the establishment of the Infrastructure, Climate and Nature Fund (2024) was announced.[32] The objective of this fund will be to ensure that the Irish Government can continue to finance capital spending even during an economic downturn. Recognising that climate challenges affect all parts of society, the fund has a climate and nature component, worth over €3 billion, the aim of which is to help the achievement of certain climate, nature and water quality targets through capital projects. An initial contribution of €2 billion will be made to the fund in 2024 following the dissolution of the National Reserve Fund and it is proposed that the fund will grow incrementally for seven consecutive years by €2 billion per annum.[33] Ownership of the fund will be vested in the Minister for Finance and the fund will be managed and controlled by the National Treasury Management Agency (NTMA) and be subject to an investment policy and investment strategy.

1.2.9.6 International Climate Finance

Ireland's Programme for Government (2020) committed to doubling the proportion of Official Development Assistance (ODA) that is climate finance by 2030.[34] In July 2022, the Government published Ireland's International Climate Finance Roadmap demonstrating plans for scaling up its international climate financing to provide at least €225 million by

[31] Department of Public Expenditure, NDP Delivery and Reform (2023)

[32] Department of Public Expenditure, NDP Delivery and Reform (2023)

[33] Department of Public Expenditure, NDP Delivery and Reform (2024)

[34] Government of Ireland (2020)

2025. In 2021 Ireland provided €99.6 million in climate finance –a 12.8% increase compared to 2020.[35] In terms of adaptation, 48% of Ireland's climate finance was directed to programmes and projects focused on resilience and adaptation to climate change – including a €5 million contribution to the Adaptation Fund to support the most climate vulnerable developing countries including Small Island Developing States (SIDS). A further 48% of climate financing was channelled to cross-cutting activities (i.e., both mitigation and adaptation) with 4% targeted at mitigation activities. The majority of Ireland's international development cooperation and climate action is focused on Least Developed Countries (LDCs)[36]. As Ireland has an over-arching commitment to reaching the Furthest Behind First, in line with our International Development Policy *A Better World*, the majority of Ireland's international climate action is focused on Least Developed Countries (LDCs) and SIDs.[37].

1.2.10 Private sector progress on climate adaptation

There is broad consensus that the private sector should play a key role in advancing in climate change adaptation[38]. The IPCC AR6 notes that government actions, with civil society and the private sector play a crucial role in "enabling and accelerating shifts in development pathways towards sustainability and climate resilient development"[39]. Furthermore, the UNFCCC Paris Agreement "welcomes the efforts of all non-Party stakeholders to address and respond to climate change, including those of civil society, the private sector, financial institutions, cities and other subnational authorities"[40].

1.2.10.1 National progress

To date, research conducted by the EPA on climate change risks and opportunities facing the national private sector found that business preparedness for the impacts of climate change remains low.[41] The research highlighted three key drivers of adaptation action – regulatory disclosure requirements (e.g., the EU Corporate Sustainability Reporting Directive (CSRD) and the EU Taxonomy), investor and insurer pressure, and supply chain pressure. Nonetheless, the focus of action in the private sector has tended to be on climate mitigation

[35] Department of Foreign Affairs (2021)

[36] Department of Foreign Affairs (2021)

[37] Department of Foreign Affairs (2021)

[38] Klein et al. (2020)

[39] IPCC (2023)

[40] UNFCCC (2015)

[41] EPA (2021)

and less on how businesses will adapt to climate change with a perception that the impacts of climate change in Ireland will be less severe than in other regions[42].

To enable improvements in climate adaptation action at the private sector level, the EPA recommends further research is needed on climate risks and opportunities for the Irish private sector, including at the sub-sector and individual business level due to different climate-related risks and opportunities of relevance to them. Moreover, access to transparent and actionable information is needed for businesses to undertake climate risk and opportunity assessments. A national, sector-specific climate risk and opportunity database should be established to support a standardised approach for the private sector in undertaking climate risk and opportunity assessments[43] which will support improved decision-making for adaptation action. The outputs of the forthcoming NCCRA will support an improved understanding of climate risk to inform adaptation planning and decision making.

1.2.10.1.1 Financial sector progress case study – Central Bank of Ireland

From a disclosure perspective, in March 2023 the Central Bank of Ireland published the first annual climate-related financial disclosures of its investment assets which sets out the climate-related impact of the Bank's investment assets.[44] These annual climate-related disclosures will improve transparency on climate-related risks of investment assets held by the Central Bank.

In addition, the Central Bank has published Guidance for (Re)Insurance Undertakings on Climate Change Risk to support the financial system's resilience in the face of climate-related risks and transition to a low-carbon economy. This guidance aims to assist (re)insurers in addressing climate-related risks and developing governance and risk management frameworks[45].

1.2.10.1.2 Commercial semi-states progress case study – NewERA

In July 2022, the Government approved the Climate Action Framework for the Commercial Semi-State (CSS) Sector. The Framework was prepared by the New Economy and Recovery Authority (NewERA), in consultation with DECC and DPENDR, to address climate action objectives as per Action 55 of the Climate Action Plan 2021. Within the Framework, climate action is understood to encompass both mitigation and adaptation. The Framework

[42] Deignan et al. (2022)

[43] Deignan et al. (2022)

[44] Central Bank of Ireland (2023)

[45] Central Bank of Ireland (2023)

consists of five commitments, as summarised in the graphic below. By adopting the Framework, CSS companies are committing to a best practice approach to the governance of their climate action objectives (Commitment 1), which for many companies include objectives relating to adaptation as well as mitigation. Board oversight of how objectives are set, and of progress towards achieving them, is a critical element of this approach, as is the inclusion of climate risks in risk management processes. The Framework also includes a commitment to a best practice approach to climate-related disclosures (Commitment 5), which most CSS companies plan to evidence through compliance with the requirements of the Corporate Sustainability Reporting Directive. In order to make the required disclosures, it will be necessary for companies to undertake detailed assessments of the anticipated financial effects stemming from climate change and many have already begun this process.

Periodic reviews of the Framework will be undertaken by NewERA in conjunction with DECC and DPENDR to assess whether updates are required to reflect policy and legislative developments, and the evolution of what is considered international best practice in corporates' approach to climate action objectives. Any proposed updates to the Framework would be considered in consultation with the CSS companies. The next review will include consideration of the extent to which any elements, specific to adaptation, would enhance the value of the Framework, in the context of the approach that the CSS companies have taken to climate action objectives related to adaptation to date.

Figure 3 Five Commitment Approach outlined in the NewERA Framework for the Commercial Semi-State Sector to address climate action objectives (NewERA)

1.3 Summary

It is unequivocal that global warming is happening and that human activities have been the dominant cause of climate change since the mid-20th century.

In response to current and potential future impacts of climate change, there has been a surge in the implementation of relevant policies, tools and mechanisms at the national level to both mitigate and adapt to climate change. Given that the effects will be experienced for decades to come, it is crucial to establish robust, actionable, and effective measures and strategies to prepare for and respond to changing climate conditions. Climate adaptation is essential to reduce vulnerabilities and strengthen resilience to safeguard communities, sectors, regions and ecosystems against climate-related impacts.

This NAF is being developed at a time when adaptation is becoming a more important policy priority across many areas. It recognises the importance of continually updating our national strategy in line with key developments in a changing policy landscape. This will help to continually strengthen the national adaptation response in line with developments made in climate policy and science and as the impacts of climate change become more evident.

2 Framework for Delivering Climate Adaptation and Resilience

2.1 Introduction

This Chapter establishes the new NAF for delivering climate resilience. It accounts for the progress made in climate policy, research, sectoral and local adaptation planning as well as the recommendations from the review of the NAF (2018), this Chapter will set out:

- Our vision for a climate resilient Ireland
- The guiding set of principles for adaptation as described in international research literature that should guide adaptation action in Ireland
- How climate adaptation should be mainstreamed into national/local policy and decision-making processes in Ireland
- The roles of key stakeholders and actors in strengthening national adaptation and resilience
- The creation of an enabling environment and culture for effective climate adaptation action
- The requirements for local and sectoral adaptation planning and delivery under this NAF
- Irelands approach to climate change adaptation in emergency planning, management, and evaluation; and
- Future adaptation research priorities.

2.2 What will a climate resilient Ireland look like?

A climate resilient Ireland will acknowledge and consider climate risk, be proactive and flexible in the face of the impacts of climate change, will be open to innovative climate change solutions while also ensuring the safety and prosperity of our communities and that we look after those most impacted by climate change.

A climate resilient Ireland will have a reduced reliance on fossil fuel, it will have widely accessible electrified public transport and will have transitioned towards sustainable agricultural practices such as agroforestry and organic farming. Natural habitats will be protected and restored, and coastal areas and communities will be supported to the extent possible in adapting to the effects of sea level change. Ireland's buildings will be energy

efficient and investment in our water infrastructure will provide resilience to droughts and floods. Irish industries will embrace circular economy principles and climate education will be integrated into our schools.

Overall, a climate resilient Ireland will represent a holistic approach to sustainability, integrating environmental, social, and economic considerations to build a prosperous and resilient future for generations to come.

2.3 Guiding Principles for Adaptation and Resilience

The utilisation of key guiding principles for climate change adaptation and resilience aims to ensure that efforts to address climate-related challenges are not only effective but also just, ethical, and sustainable. The principles-based approach serves to guide decision-makers, communities, and organisations in adapting effectively and equitably to a changing climate while safeguarding well-being and supporting the vision outlined in the previous section. Future sectoral and local plans and strategies must demonstrate how these guiding principles have been considered and should be especially aware when utilising these principles that adaptation actions increase climate resilience without causing unintended consequences in other areas. Sectoral and local government should examine these principles in the context of developing a “vision” for climate resilience that establishes a key mission statement for what climate resilience within a sector or local authority area would look like.

The key guiding principles, grouped into high-level themes include:

Adaptation governance, engagement and resourcing

- **Adaptive Governance:** Establish effective governance structures and policies that support adaptive management and coordination among various stakeholders.
- **Local Knowledge and Community Engagement:** Incorporate local knowledge, involve affected communities in decision-making, and empower them to contribute to adaptation solutions.
- **Mobilise Existing and New Resources:** Maximise the efficient use of existing and new resources, including financial, human, and natural resources, to achieve adaptation.

Improving the Evidence Base and Capacity for Adaptation

- **Global Cooperation:** Recognise that climate change is a global challenge, and cooperate with international partners to share knowledge, resources, and expertise.
- **Openness and Knowledge Transfer:** Sharing best practises in adaptation, improving data collection of adaptation relevant information as well as the clear communication of this information are all essential for adaptation processes.
- **Science-Based Decision-Making:** Base adaptation strategies on the best available scientific knowledge, national guidance and data to effectively address current and future climate risks.
- **Account for Uncertainty:** Uncertainties are an inherent part of all projections of climate change and its impacts. They will never be fully eliminated but adaptation measures will be required, nonetheless. A precautionary approach to adaptation should be adopted.
- **Climate Scenarios:** When prioritising climate change impacts at regional and local levels, both past weather events and scenarios of possible future climatic and socio-economic changes should be analysed.

Adaptation Design and Planning

- **Avoiding Maladaptation:** Ensure that adaptation actions do not inadvertently create new vulnerabilities or exacerbate existing ones.
- **Just Resilience:** Prioritise vulnerable and marginalised communities, ensuring that adaptation efforts are inclusive, and support fair and equitable outcomes.
- **Sustainability:** Ensure that adaptation measures promote long-term sustainability, minimising negative environmental and social impacts.
- **Ecosystem-based / nature-based options for adaptation**: Employ ecosystem-based or nature-based adaptation options, to reflect the biodiversity-rich ambition of the national climate objective.
- **Consideration of Climate Mitigation**: Ensure that climate mitigation outcomes are considered alongside adaptation planning where appropriate.
- **Transformational Adaptation**: Acknowledge that adaptation measures may need to entail transformative action that focuses on system-level change to address the root causes of risk.

- **Integrated Approach**: Adopt a holistic, cooperative, and cross-sectoral approach that considers the interconnectedness of climate change impacts and adaptation measures.

Adaptation Management and Monitoring

- **Prioritise Adaptation Actions:** It will not be practical to undertake all adaptation options identified. Implementation of adaptation actions must be prioritised according to relevant criteria such as efficacy, cost-effectiveness, risk, and urgency and ensuring just resilience.
- **Flexible and Adaptive Management:** Be prepared to adjust adaptation strategies as new information emerges and as climate conditions change over time.
- **Monitoring Progress:** It will be necessary to establish appropriate monitoring mechanisms and indicators to ensure the effectiveness of sector specific adaptation responses. Such mechanisms will also ensure efficient use of resources while allowing flexibility in how plans are implemented and considering the impacts of responses from a just resilience perspective.

These principles provide a solid foundation for designing and implementing climate change adaptation strategies that enhance resilience, reduce risks, and promote sustainable, equitable outcomes in the face of a changing climate.

2.4 Mainstreaming climate adaptation into national and local policy and decision-making processes

In Ireland, there are many relevant stakeholders that hold specific responsibilities and statutory powers that can facilitate the successful mainstreaming and integration of climate adaptation considerations across all levels of Irish policymaking and ensuring alignment with the principles of this NAF. Government authorities, including departments and local authorities, are tasked with integrating climate resilience into their policies, strategies, and plans, particularly within scheduled and ongoing policy and plan reviews, infrastructure design, and construction. This includes ensuring that climate adaptation becomes a central consideration in decision-making processes, resource allocation and regulatory frameworks. Sectoral bodies responsible for specific domains including, for example, agriculture, health, and transport, are expected to incorporate climate adaptation into their strategies and operations, developing guidelines and standards for climate-resilient practices within their respective sectors. Research and knowledge institutions provide the necessary climate data and research to inform policymakers – offering insights, data, and expertise to support

climate-resilient decision-making. Specific skills gaps required for adaptation will need to be identified and filled. Training will be needed to ensure that key roles are equipped with the skills necessary to integrate good adaptation practises into their existing roles.

Local communities and civil society play an active role in advocating for climate adaptation and raising awareness among citizens. The private sector, including businesses and industry, is responsible for implementing climate resilient practices within its operations, supply chains, and infrastructure. International partners and development organisations contribute to capacity-building, knowledge sharing, and financial support – enhancing Ireland's ability to address climate challenges. Regulatory bodies should ensure that climate adaptation is embedded in environmental regulations and permitting processes, encouraging businesses and sectors to adopt sustainable practices.

Avoiding working in isolation to tackle climate change is key to responding effectively and comprehensively to this global issue. When sectors, organisations, or governments operate independently, focusing only on their areas without recognising how climate impacts are connected, it limits our ability to address the problem fully and the adaptation options available to us. It can lead to unintended consequences that increase climate risk and maladaptation. To overcome this, it's vital to encourage collaboration and the sharing of information across different areas. This means breaking down old barriers and encouraging teamwork that looks at all aspects of climate risks. By working together and integrating our efforts, we can develop strategies that better understand the complex nature of climate change, leading to stronger and more sustainable solutions for both communities and the natural world.

Successful mainstreaming of climate adaptation requires collaborative efforts and the alignment of responsibilities amongst the stakeholders to ensure that climate resilience becomes an integral part of Ireland's development trajectory and that the NAF's goals are effectively achieved.

2.5 Role of key actors in strengthening national adaptation and resilience

To deliver effective climate adaptation and achieve resilience, a whole-of-government approach is required given the cross-sectoral, transboundary nature of climate change. In terms of the NAF's development, implementation and review, the role of key actors across government departments and agencies is outlined below. These key actors include the

Department of the Environment, Climate and Communications, the Climate Action Delivery Board, the EPA and the Climate Change Advisory Council

2.5.1 Role of the Department of the Environment, Climate and Communications

The Department of the Environment, Climate and Communications (DECC) in Ireland leads on the development, implementation, and review of the NAF. Its responsibilities are set out in the Climate Act. Under the legislation, DECC is tasked with overseeing the development of Ireland's NAF, which encompasses the strategic planning and coordination necessary to address climate-related challenges. DECC convenes four meetings per annum of the National Adaptation Steering Committee (see section 1.25) and members contribute to the meetings sharing progress, case studies, national and EU Adaptation developments.

In the development phase, DECC works collaboratively with other government departments, local authorities, and relevant stakeholders to formulate Ireland's adaptation strategy. This strategy outlines the objectives, targets, and actions required to enhance the national resilience to climate impacts. It also addresses sector-specific adaptation needs, integrating climate resilience into various aspects of policymaking and planning.

During implementation, DECC provides leadership and support to ensure that the NAF's provisions are put into action effectively. The Department plays a key role in fostering cross-sectoral cooperation to drive adaptation efforts forward. DECC assists Met Éireann, the EPA and other bodies to progress crucial adaptation developments including the NFCS, Climate Ireland and the NCCRA. DECC issues Ministerial Guidelines to LAs for the development of LACAPs as outlined in the Local Authority Section (Section 2.7.3). Furthermore, DECC is instrumental in ensuring that climate adaptation actions are included appropriately in the statutory national Climate Action Plans and in other relevant national policy. Through these actions, DECC contributes significantly to Ireland's ongoing efforts to adapt to the challenges posed by climate change.

Internationally, DECC is also responsible for reporting on Ireland's Climate adaptation progress under EU regulations, working with the Commission and other Member States to ensure that Ireland's policy response is ambitious and takes account of EU Adaptation policy. Information on EU developments is disseminated to Sectors and the LAs through the NASC. DECC also formulates a communication on Climate Action to the UN every four years, including a chapter on Climate Adaptation.

2.5.1.1 Role of Geological Survey Ireland (GSI)

Founded in 1845, the Geological Survey Ireland (GSI) is Ireland's public earth science knowledge centre and is a division of the Department of the Environment, Climate and Communications. The overall aim of GSI is providing open and accurate information on Ireland's natural resources to stakeholders, within Ireland and internationally.

GSI has an active role in key climate adaptation areas, including:

- Coastal Change Assessment for informed coastal risk management and evidence-based climate resilience planning and adaptation.
- GWClimate is a groundwater monitoring and modelling project which aims to investigate the impact of climate change on groundwater in Ireland.

2.5.2 Role of Department of An Taoiseach

The Taoiseach, as Head of Government, is the central co-ordinator of the work of the Ministers and their Departments of State. The Taoiseach also advises and guides the other members of the Government when they are faced with issues requiring the successful working of the Government as a collective authority responsible to Dáil Éireann. The Taoiseach sets broad Government policy and keeps the President informed on domestic and international policy.

A Senior Officials' group (SOG) may be established to support the work of a cabinet committee and can also provide cross-departmental co-ordination on relevant issues. In October 2023, a sub-group of the Senior Officials Group on the Environment and Climate Change was established to examine resources and governance for Climate Adaptation policy.

The Terms of Reference of this SOG Adaptation sub-group were to examine existing adaptation policy and delivery of adaptation measures and whether the existing structures for identifying risks, allocating responsibility, delivering actions, and ensuring oversight are in place and working effectively. As part of its work, the sub-group invited Departmental and Agency representatives and invited speakers to provide an overview of their role in adaptation, including OPW, EPA, Met Éireann and CCAC Secretariat.

The deliberations of the SOG Adaptation sub-group were considered as part of the development of this NAF. They will also form a useful basis for future discussions of adaptation at the SOG on the Environment and Climate Change, including an examination of how the SOG can assist in ensuring better implementation of adaptation across Government.

2.5.3 Role of the Climate Action Delivery Board

The Climate Action Delivery Board is responsible for overseeing and coordinating the implementation of Ireland's Climate Action Plan, ensuring that the nation effectively mitigates and adapts to the impacts of climate change. It is jointly chaired by the Secretaries General of the Department of the Taoiseach and DECC. Its key responsibilities include monitoring the progress of climate actions, reviewing and updating targets, and engaging with various stakeholders to drive climate action measures, including those relevant to adaptation.

2.5.4 Role of Climate Change Advisory Council

Under the Climate Act, the Climate Change Advisory Council (CCAC) is assigned responsibility for providing continuous input to and assessment of national climate change initiatives. The core role of the CCAC is assessing and advising Government on climate change policy. In 2016, the CCAC established an Adaptation Committee which aims to support the Council with its role in relation to climate adaptation. The Adaptation Committee provides an additional layer of support for the Council in ensuring matters relating to climate adaptation and resilience are appropriately examined.

A crucial workstream of the CCAC is the publication of its annual review on progress towards achieving the national climate objective. These reviews focus on Ireland's performance during the preceding year on national goals relating to climate change adaptation and mitigation, and compliance with EU and international climate-related obligations. As part of its annual review, the CCAC also considers developments made in terms of supporting a just transition in terms of both mitigation and adaptation – noting in its 2023 review the need to accelerate the integration of the just transition principles across all mitigation and adaptation policy development and implementation[51].

The CCAC's work also provides an important assessment of sectoral progress on adaptation. In terms of the NAF, the CCAC provided valuable recommendations for reviewing the 2018 NAF, and also leveraging its expertise to ensure the 2024 NAF reflects the advancements made to date on climate adaptation policy, research, and science.

Moving forward, the CCAC will continue to play a central role of independent, expert climate adaptation and resilience advice to ensure Ireland progresses in line with national and EU policy commitments.

[51] CCAC (2023)

2.6 Creating an enabling environmental for effective climate adaptation action

It is critical to ensure that there are appropriate enabling conditions in place that support the development and implementation of climate adaptation measures. The creation of such an enabling environment includes:

- The development of a strong evidence base and capacity to deliver targeted and informed measures.
- The establishment of appropriate funding structures which channel investment, mainstreaming adaptation into key sectors.
- A planning process, including the National Planning Framework, that integrates climate adaptation criteria and objectives.
- A proactive role for wider actors, such as civil society and the private sector, who can champion the implementation of climate change adaptation through behavioural change, awareness raising and investing in on-the-ground adaptation solutions.

2.6.1 Development of the Evidence Base

Adaptation planning and actions should be based on a robust evidence base and accessible data. This includes evidence of not only climate hazards, exposures and vulnerabilities but also of climate adaptation interventions and practical approaches to climate adaptation planning. The role of the EPA, Met Éireann, the OPW, Commercial Semi-States and research in the development of the evidence base is outlined below.

2.6.1.1 Role of the EPA

The EPA's strategic plan 2021-2026 identifies the EPA's role in climate adaptation and resilience in Ireland. EPA's evidence and data on the impacts of climate change will inform Ireland's approach to adaptation and enable the transition to a climate-resilient environment, economy, and society.

The EPA plays a key role in adaptation governance and implementation structures by delivering across the areas of climate risk, climate services, evidence and knowledge. This includes providing technical support for climate adaptation in Ireland by developing and delivering Ireland's National Adaptation Platform, Climate Ireland (www.climateireland.ie), to its full potential, guidance and tools for policy makers, local authorities and sectoral

adaptation leads, and the further development of the Climate Ireland Adaptation Network (CIAN).

In terms of Climate Risk, the EPA informs and supports decision making under uncertainty and adaptation planning at national, sectoral and local government levels and is leading the delivery of Ireland's first National Climate Change Risk Assessment to prioritise climate change impacts and actions across all sectors.

To progress adaptation research, the EPA develops capacity in climate adaptation through the EPA Research Programme and supports adaptation planning through their environmental monitoring and reporting programmes. The EPA works to integrate climate resilience and adaptation priorities across EPA work areas to optimise co-benefits for the environment and public health. In particular, focusing on water quality and quantity (Water Programme), Environmental Licensing, and incorporating climate change risk into emergency preparedness. The EPA also provides and supports development of timely evidence and knowledge to drive adaptation planning and implementation in Ireland through its delivery of EU and UNFCCC adaptation reporting, participation and leadership in national adaptation fora and at EU level in EEA EIONET.

In March 2024, the European Environment Agency (EEA) published the European Climate Risk Assessment (EUCRA). At the national level, the EPA is currently developing the National Climate Change Risk Assessment. These assessments will strengthen the existing knowledge base on climate-related hazards and risks in Europe and Ireland, which will support improved adaptation planning and decision-making. Ultimately, these assessments will act as a critical decision-making support tool for identifying adaptation-related policy priorities, informed by robust climate science. As such, these assessments act as levers for further enabling effective adaptation action.

2.6.1.2 Role of Met Éireann

The key role of Met Éireann in terms of climate adaptation and resilience is its research, climate modelling, the provision of climate services and the coordination, under the NFCS, of climate services produced by other national competent authorities. As part of its Weather and Climate Research Programme, Met Éireann will continue to support national capacity and capability across areas such as weather, climate and hydrology. Met Éireann's central research activities include climate modelling, climate services development, flood forecasting capability development and weather and climate monitoring network development. As discussed in Section 1.2.6.1, Ireland's National Framework for Climate Services falls under the remit of Met Éireann which will provide important climate decision support tools.

2.6.1.3 Role of the OPW

The OPW delivers public services for flood risk management, managing government properties and heritage services. Crucially in terms of the NAF, the OPW acts as the leading agency for flood risk management in Ireland with the aim of minimising the impacts of flooding through sustainable planning[52] and it is the competent authority for flooding related climate services. It is also the national authority for the implementation of the EU Directive on the Assessment and Management of Flood Risks (2007/60/EC). The OPW focuses on three strategic and policy areas founded on a robust evidence base developed through data collection, research and assessment[53]:

- Prevention: e.g., avoiding development in flood-prone areas
- Protection: e.g., taking feasible measures, both structural and non-structural, to reduce the likelihood and impact of floods
- Preparedness: e.g., informing the public about dealing with flood risk and a flood.

The OPW has made significant progress on implementing its flood risk management SAP. Looking ahead, the OPW will continue to play a critical role in ensuring Ireland's adaptation and resilience to flooding.

2.6.1.4 Role of the Commercial Semi-State Sector

The Commercial Semi-State Sector has a role to play in supporting the delivery of an enabling environment for adaptation and resilience through, for example, safeguarding its own operations and services as well as supporting the wider implementation of adaptation actions.

Periodic reviews of the approved Climate Action Framework for the Commercial Semi-State (CSS) Sector will be undertaken by NewERA in conjunction with DECC and DPENDR, to assess whether updates are required to reflect policy and legislative developments, and the evolution of what is considered international best practice in corporates' approach to climate action objectives. Any proposed updates to the Framework would be considered in consultation with the CSS companies. The next review will include consideration of the extent to which any elements, specific to adaptation, would enhance the value of the Framework, in the context of the approach that the CSS companies have taken to climate action objectives related to adaptation to date.

[52] gov.ie (2023) About the Office of Public Works

[53] Flooding.ie

2.6.1.5 Role of Research

Funding for climate change research falls within the remit of the DECC which has allocated responsibility to the EPA for coordinating environmental research in Ireland. The primary climate-related research programme in Ireland is the EPA Research Programme 2021-2030 which includes 'addressing climate change evidence needs' as one of its four interconnected hubs.

Climate change research is additionally funded and co-funded by state bodies and organisations such as Met Éireann, SEAI, Teagasc, Economic and Social Research Institute (ESRI), Marine Institute Ireland, Geological Survey Ireland (GSI), Department of Agriculture, Food and the Marine (DAFM), Department of Transport (DOT), Irish Research Council (IRC), and Science Foundation Ireland (SFI). GSI funds Climate Change research in geoscience. For example, research funding is a key component of Met Éireann's 10-year strategy 'Making Ireland Weather and Climate Prepared' – which has a mission to contribute to the development of national capacity and to address key scientific questions in response to Ireland's challenges and opportunities resulting from climate change[54].

Research can also be funded through European programmes including Horizon Europe, the L'Instrument Financier pour l'Environnement (LIFE) Programme, the EU Innovation Fund, European Regional Development Fund (ERDF) and COST (European Cooperation in Science and Technology)[55].

Research institutions and scholars play a pivotal role in advancing climate change adaptation in Ireland. Their contributions are multifaceted, encompassing the generation of knowledge, development of innovative solutions, and the provision of evidence-based guidance. Researchers, often affiliated with universities and institutes, engage in climate impact studies, risk assessments, and the identification of emerging threats, offering a solid foundation for effective adaptation strategies.

Climate research must closely consider the requirements of decision makers, with long-term planning and capacity building needed to deliver the necessary knowledge and innovations regarding adaptation and resilience. There is also a need for continued, long-term coordinated efforts at a national level on the interface between science and policy and aligning outputs to end-user needs, particularly in light of the differing capacities and resources available to sectors and local authorities.

[54] Met Éireann (2023)

[55] Government of Ireland (2023)

Organisations such as the EPA and the Irish Climate Analysis and Research Units lead the way in supporting and producing climate data and analysis that inform adaptation policies and actions. They collaborate with governmental bodies, local authorities, and civil society to develop cutting-edge solutions that address climate vulnerabilities. Additionally, research in climate adaptation informs decision-making, facilitates the design of resilient infrastructure, and contributes to risk reduction strategies. Overall, the role of research is fundamental to leveraging Ireland's preparedness for the challenges of a changing climate, providing the insights and solutions necessary to build a more resilient and sustainable future.

2.6.2 Finance for climate adaptation

As outlined in Climate Action Plan 2023, successful adaptation requires that an analysis of future climate change impacts is mainstreamed into decision-making and policies across all relevant sectors. It is important that this includes the allocation of sufficient funding, capital investment and public expenditure to adaptation measures, such as flood risk management and cross-cutting adaptation measures across relevant sectors. The integration of climate adaptation actions into decision-making and policies across all pertinent sectors is financed by the Exchequer. This funding flows through the respective Department's budget allocations and the designated subheads for each policy and action area, ensuring that climate adaptation measures are adequately supported across various sectors.

To mainstream and create an enabling environment for adaptation, public finance should both directly and indirectly target adaptation through ensuring funding for adaptation measures and the inclusion of climate considerations in public planning and investment programmes. Options may include specific budget coding for adaptation actions, and explicitly detailing adaptation funds allocated, differentiated by types of cost (capital, or personnel costs, for example).

Section 1.2.9 outlined the progress made on financing for climate adaptation in Ireland, including the Climate Action Fund, NDP Strategic Outcome 8, Infrastructure, Climate and Nature Fund, and ISIF's Climate Investment Strategy. It is crucial that as these plans, frameworks and funds are reviewed, that adaptation is continuously integrated as a key consideration and criterion. For example, sectoral and Local Authority decision-makers could consider the potential opportunity to directly promote adaptation projects at various levels (e.g., community and regional) through the Climate Action Fund.

In addition, there is a need for an assessment of the prioritised investment needs of adaptation, quantifying what is required to make Ireland resilient by 2050 and beyond. Such an assessment should consider the funding that is required to adapt to climate change and

how it should be prioritised. This could include setting an initial adaptation budget to 2030. This could be determined in light of the social cost of climate change over at least the next 30 years. Such budgetary planning is important as projects may have to begin in the short- or medium-term if they take a long time to mature or require significant investment, e.g., coastal protection or national long-term water supply projects. The role of the Department of Public Expenditure, NDP Delivery and Reform will be key in this regard.

2.6.3 National planning processes

Ireland's planning process provides an important enabling environment to mainstream climate change adaptation. Sustainable Development and the achievement of the SDGs continues to provide both the underpinning philosophy and the guiding objectives for planning.[56] Cross-cutting planning frameworks and policies, such as the National Planning Framework and Regional Spatial Economic Strategies, and compliance processes such as Strategic Flood Risk Assessment, Strategic Environmental Assessment, and Appropriate Assessment, allow for the integration of climate adaptation objectives at the national, regional, and local level. As outlined below, these assessments play a crucial role in integrating environmental considerations into decision-making processes, helping to strike a balance between development and environmental conservation in Ireland while complying with European Union directives and regulations. Planners are well placed to facilitate these processes, however the need for increased staff numbers in local authority planning departments to allow this to occur has been previously flagged and further research is needed on how to strategically integrate long-term projections into spatial planning and the siting of critical infrastructure.

2.6.3.1 The National Planning Framework

Project Ireland 2040 is shaped by the National Planning Framework (NPF) and the National Development Plan (NDP) 2021, guiding Ireland's social, economic, and cultural development. The NPF is instrumental in climate change adaptation, emphasising sustainable and resilient urban and rural planning to forge communities and infrastructures capable of withstanding climate impacts. It incorporates climate adaptation measures to promote climate-resilient cities and towns, sustainable land use, and the inclusion of green spaces and renewable energy.

The NPF also stresses the importance of incorporating adaptive strategies into building codes, infrastructure projects, and community planning, which enhances Ireland's readiness

[56] Government of Ireland (2021)

for climate challenges and supports sustainable development. Emphasis on compact growth recognises the need to address climate impacts like increased impermeable surfaces and their flooding risks, the orientation of buildings for optimal solar gain and ventilation and leveraging green infrastructure to reduce flood risks and risks of overheating. It advocates for urban lands to offer ecosystem services, including cooling and flood alleviation, through effective land management.

Currently, the NPF is undergoing its first revision, with the new NPF expected in September 2024.

2.6.3.2 Regional Spatial and Economic Strategies (RSES)

Regional Spatial and Economic Strategies (RSES) are comprehensive planning frameworks that play a pivotal role in guiding the development and economic growth of regions. Typically created and implemented by regional assemblies or government bodies, these strategies are instrumental in shaping regional policies and investments. A key aspect of RSES is their incorporation of environmental and climate considerations. They prioritise sustainable development practices, acknowledging the importance of mitigating environmental impacts and adapting to the challenges posed by climate change. These strategies outline the long-term vision for a region, taking into account factors like land use, transportation, housing, and infrastructure. Moreover, RSES serve as a crucial foundation for aligning county-level plans, ensuring coordinated and coherent development across different administrative units within a region, ultimately striving for a balanced and sustainable economic and environmental future.

2.6.3.3 Strategic Flood Risk Assessment (SFRA), Strategic Environmental Assessment (SEA), Appropriate Assessment (AA) and Environmental Impact Assessment (EIA)

In Ireland, Strategic Flood Risk Assessment (SFRA), Strategic Environmental Assessment (SEA), Appropriate Assessment (AA) and Environmental Impact Assessment (EIA), are integral tools for ensuring sustainable development and environmental protection. These assessments include various requirements to address climate change across different levels of the planning and consenting process and are guided by specific requirements and regulations or guidelines to address various aspects of environmental planning and decision-making.

Box 5

Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is necessary to assess the impact of projects on climate (for example GHG emissions) and their vulnerability to climate change (EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU)

Strategic Flood Risk Assessment: The need for undertaking SFRA is set out in the Section 28 Guidelines for the Planning System and Flood Risk Management.[57] SFRA is a means for assessing flood risk as part of the planning processes at all levels and informing decision-making in line with the sequential and risk-based approaches set out in the Guidelines to promote sustainable development and avoid inappropriate development in flood-prone areas.

Strategic Environmental Assessment: SEA is a broader assessment process that integrates environmental considerations into the development and implementation of plans, policies, and programmes. It is governed by the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004)[58], as amended, and the Planning and Development (Strategic Environmental Assessment) Regulations 2004, as amended, which implement the EU SEA Directive (2001/42/EC). SEA helps ensure that strategic decisions consider environmental protection and sustainable development. These assessments are carried out regularly, particularly when drafting new national, regional, or local development plans or significant policies.

Appropriate Assessment: Focuses on the conservation of natural habitats and species protected under the EU Habitats Directive and Birds Directive. It assesses whether a proposed plan or project could adversely affect Natura 2000 sites, which are designated areas for the conservation of biodiversity. Appropriate Assessment is mandated under, inter alia, the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. It must be conducted whenever a plan or project is likely to impact Natura 2000 sites and assesses the potential impacts and mitigation measures to ensure site conservation. The need for Appropriate Assessment arises as part of the planning or consenting process and is essential for protecting Ireland's unique biodiversity.

[57] OPW (2021)

[58] For certain land-use plans, the transposing regulations are the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004) as amended.

Environmental Impact Assessment: EIA is a critical process that evaluates the potential environmental impacts of proposed projects before they are approved or authorised.[59] In Ireland, EIA is mandated under sectoral legislation (primary and secondary) which implement the EU EIA Directive. EIA examines projects such as infrastructure development, industrial facilities, or urban planning to assess their potential effects on the environment. It is important that EIA Reports provide clarity on whether climate resilience has been appropriately considered in the design and implementation of a development scheme. It requires the submission of comprehensive environmental impact statements and public consultation. The frequency of EIA depends on the scale and nature of the project but is generally required for significant developments.

2.6.3.4 Coastal Change management and assessment

The report of the Inter-Departmental Group on National Coastal Change Management Strategy was prepared jointly by the Department of Housing, Local Government and Heritage & the Office of Public Works and approved by Government in October 2023. The report is centred on developing management responses to coastal change over the short, medium and longer terms and providing a comprehensive whole of Government approach to the development of the range of policy responses to the challenge of coastal change. The relevance of climate change to the impacts of coastal change are considered comprehensively throughout the report.

The report recommends that the OPW should develop a national-scale coastal erosion hazard mapping and an associated risk assessment using the latest available data and methodologies. This mapping should include an assessment of the potential impact of a range of sea level rise scenarios on coastal erosion rates to ensure areas at highest risk of erosion due to climate change can be identified.

The report designates The Department of Housing, Local Government and Heritage the lead coordination role, to promote a joined-up, whole of Government response to coastal change by all relevant Departments / Agencies having regard to their existing policy remits and to establish and chair an Interdepartmental Steering Group on Coastal Change to identify possible approaches, associated resource requirements, and to develop the range of policy responses that the challenge of coastal change encompasses.

[59] EPA (2021)

2.6.4 Private Sector, Civil Society and International Development

The inclusion of the private sector, civil society, and international development in climate change adaptation frameworks is crucial because these entities bring diverse resources, innovative solutions, and broad stakeholder engagement necessary for comprehensive and effective adaptation strategies. Their collaborative efforts can enhance resilience, distribute responsibilities, and ensure that adaptation measures are both sustainable and inclusive, addressing the needs of the most vulnerable populations.

2.6.4.1 Role of Private Sector

The private sector in Ireland holds a critical role in further enabling climate change adaptation by actively engaging in several key actions and responsibilities. Businesses and industries, being both affected by climate change impacts and contributors to adaptation efforts, are at the forefront of developing and implementing innovative technologies and practices to enhance climate resilience. This entails investments in renewable energy, sustainable agriculture, and efficient water management systems, for example. Collaborative partnerships with the government further empower businesses to fulfil their role in climate adaptation by pooling resources and expertise, innovation, fostering green job opportunities, and collectively working towards a more sustainable and resilient future for Ireland.

2.6.4.2 Role of Civil Society

Civil society, which includes individuals and non-governmental organisations, has a significant role in enabling climate change adaptation in Ireland from the bottom up. At the individual level, people can adopt climate-resilient behaviours such as conserving energy, using water wisely, and actively participating in community initiatives. They can also make a difference through advocacy, raising awareness, and supporting policies that promote climate adaptation.[60] Non-governmental organisations (e.g., Friends of the Earth Ireland and An Taisce) are instrumental in conducting research, providing expertise, and engaging in community outreach and education to drive adaptation efforts. These NGOs often serve as a crucial link between local communities and government entities, ensuring that adaptation strategies include the needs and perspectives of marginalised groups. Additionally, NGOs hold governments accountable for their climate commitments and advocate for stronger climate policies. Together, civil society, encompassing both individuals and organisations, plays a pivotal role in supporting a climate-resilient Ireland through collective action,

[60] Irish Aid (2022) Civil Society Policy

knowledge sharing and advocacy. Furthermore, public consultations at all levels of the climate conversation regarding adaptation are imperative to success of adaptation plans.

2.6.4.3 Role of International Development

Climate change adaptation and resilience is a key focus of Ireland's international climate diplomacy and financing. The majority of this work falls within the remit of the Department of Foreign Affairs and Trade, through Irish Aid. In 2022 Ireland provided €120.8 million in international climate finance, representing an increase of 21% from 2021 (€99.6 million). 53% of these total targeted actions exclusively addressing climate adaptation and a further 27% supported actions with both adaptation and mitigation co-benefits. As such, 80% of Ireland's total international climate finance in 2022 supported climate adaptation action either as a whole or one component.

At COP26 in 2021, the Taoiseach announced that Ireland will more than double our climate finance for developing countries to reach at least €225 million per year by 2025. In July 2022, Ireland published its all-of-Government International Climate Finance Roadmap which sets the pathway for realising this target. As articulated in the Roadmap, Ireland will maintain its focus on supporting adaptation and resilience to climate change in climate-vulnerable countries.

Ireland is also one of the founding members of the Champions Group on Adaptation Finance launched in 2021, which sets out to lead the way in increasing funding for adaptation, and in ensuring the quality and accessibility of this finance.

Ireland, through Irish Aid, works with a number of organisations that fund and track adaptation action in developing countries, particularly Least Developed Countries (LDCs) and Small Island Developing States (SIDS). Through our partnership with the International Institute for Sustainable Development (IISD) (€2m in 2023), Ireland has funded and been a member of the National Adaptation Plan (NAP) Global Network since 2021, which provides tailored support to LDCs and SIDS to enhance their adaptation planning and preparedness. Through support channelled via the International Institute for Environment and Development (IIED) (€3.7m in 2023), Ireland has provided longstanding financial support to the LDC negotiating bloc. Ireland also supports the Least Developed Countries Fund under the Global Environment Facility (€2m in 2023) and the UNFCCC Least Developed Countries Expert Group (€0.5m in 2023), both of which are mandated to support climate change adaptation in LDCs. In 2023, Ireland also funded the Special Climate Change Fund (€2.1m) specifically for its window of support to SIDS for climate change adaptation.

Ireland is in the process of finalising its Climate-Proofing Strategy for International Development Cooperation and will begin its implementation in 2024.

International development agencies and organisations (e.g., the United Nations and the European Union) contribute significantly to climate change adaptation efforts in Ireland. They play a critical role in providing financial and technical support to enhance the country's resilience to climate impacts. These organisations offer expertise, funding, and best practices, helping Ireland develop and implement effective adaptation strategies. They also foster knowledge exchange and promote collaborative research initiatives to address the evolving challenges posed by climate change.

Additionally, international development entities often facilitate partnerships and cooperation between Ireland and other nations, allowing for the exchange of experiences and solutions in adaptation practices. This cross-border collaboration strengthens Ireland's ability to tackle climate challenges effectively. Furthermore, international development organisations assist in capacity-building and training, helping local communities and institutions better prepare for and respond to climate-related risks.

2.7 Requirements for sectoral and local adaptation planning

Given the potential scope and scale of the impacts of climate change, the importance of relevant government departments taking ownership of and acting as an advocate for the implementation of adaptation action across their respective sectors is crucial. Climate change impacts can be multifaceted and sector-specific, making it essential for specialised staff to identify and oversee the implementation of adaptation actions. Government departments and agencies possess the in-depth knowledge and expertise needed to understand the unique challenges and vulnerabilities within their sectors as well as to identify gaps in existing policy responses that could negatively impact overall climate resilience. They also have established linkages with their Agencies, with bodies under their aegis and with other relevant stakeholder groups that are necessary to communicate the need for adaptation and to deliver adaptation action. Each sector should identify their own relevant impacts of climate change to ensure adaptation plans are tailored and prioritised to address relevant risks and opportunities.

2.7.1 Cross-cutting Adaptation Planning

Government departments should foster cooperation in other cross-cutting policy areas pertinent to adaptation, even if not directly under their remit but necessitating their input and

advice, in recognition of the crosscutting nature of climate impacts. This is especially important in sectors such as health, flood risk management, critical infrastructure, marine and coastal issues, and emergency planning but is applicable to all sectors. Statutory responsibilities span across various government departments in certain areas, and existing structures can facilitate cooperation (e.g., Interdepartmental Marine Coordination Group, Interdepartmental Flood Policy Coordination Group and Government Task Force on Emergency Planning). It is imperative that departments engage with other sectors, key stakeholders within their own sectors, champion adaptation policies, and encourage the private sector and civil society to actively participate in collective adaptation.

Climate change impacts often transcend departmental remits, making it essential for different departments to work together. By fostering cooperation, departments can ensure that critical cross-cutting adaptation challenges are not overlooked or left unaddressed. This collaborative approach enables a holistic and coordinated response to climate change challenges, enhances Ireland's resilience and avoids potential gaps or duplications in adaptation efforts. It recognises that the collective response is greater than the sum of individual departmental actions - ultimately leading to a more robust and interconnected national adaptation strategy.

2.7.2 Sectoral Adaptation Planning

A review of sectors has been undertaken to identify additional sectors of relevance for Ireland where sectoral plans are recommended for the next cycle of adaptation planning. The 2018 NAF identified 12 sectors for assessing climate change risks, integrating adaptation into policy, and implementing resilient actions. These sectors were grouped into 9 SAPs across four themes.

In 2021, the EU adopted a new EU Adaptation Strategy[61], expanding sectoral coverage at EU level beyond those identified in the 2013 EU Adaptation Strategy [62]to include additional EU policy areas such as Biodiversity and Disaster Risk Reduction. Appendix 6 of the NAF includes a comparison with EU policy areas identified as particularly relevant to adaptation under the EU Strategy on Adaptation to Climate Change with those identified in the NAF (2018). This identifies potential gaps in the coverage of Ireland's current list of sectors.

Based on this review, two additional sectors, Tourism and Built Environment/ Planning, have been included (BE/P for a scoping exercise) as part of this NAF, while five cross-cutting

[61] Climate Adapt (2021)

[62] https://climate-adapt.eea.europa.eu/en/eu-adaptation-policy/sector-policies/index_html

policy issues (Coastal, Built Environment, Urban Environment, Health Impacts and DRR) are identified as relevant across other SAPs.

Discussions with relevant departments have resulted in agreement by the Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media to develop a Sectoral Adaptation Plan for Tourism while the Department of Housing, Local Government, and Heritage has expressed interest in scoping out parameters for a potential Built Environment and Planning SAP, with the intention of possibly developing it further at a later stage. For cross-cutting policy issues (Coastal, Built Environment, Urban Environment, Health Impacts and DRR), SAPs can be developed with improved coordination among government entities, leading to more effective policies and resource allocation. They also facilitate comprehensive solutions to interconnected climate challenges, benefiting vulnerable communities and ecosystems. For example, the collaborative effort behind the National Coastal Change Management Strategy Report[63] demonstrates the value of inter-departmental work to overcome policy and governance challenges.

Table 2 below lists the key sectors required to develop SAPs under the 2024 NAF – including the departments who have the lead responsibility in bringing this work forward. To promote enhanced cooperation and coordination, Table 2 also highlights how sectors could be grouped under four key thematic areas. The themed approach was adopted in the 2018 NAF and this approach should be retained as it encourages collaboration as well as responsibility and accountability of each department.

The four thematic areas identified are as follows:

- **Natural Environment**, which comprises landscapes, seascapes, ecosystems, plant and animal life within Ireland and its ocean territory.
- **Built Environment and Infrastructure**, which comprises human-made surroundings, structures, and any supporting infrastructure created using material, spatial, and human resources.
- **Human**, which relates to people's physical and mental health (human); the norms, rules and institutions of society (social); and the knowledge, heritage, beliefs, arts, morals, laws, customs that infuse society (cultural).
- **Economy**, which relates to the production and consumption of goods and services, as well as the financial and economic systems that enable this.

[63] Coastal Strategy report (2023)

This has progressed from the 2018 NAF, which grouped sectors into the following themes: Natural and Cultural Capital, Critical Infrastructure, Water Resource and Flood Risk Management, and Public Health. The new themes designation allows for better, more precise grouping, which will result in better collaboration opportunities. These themes align with international peers (e.g., New Zealand, Australia), which will enable better comparability, allowing stakeholders to compare progress and learn from each other.

The themed approach highlights the potential to work cross departmentally in identifying synergies and efficiencies that can be achieved to bring coherence between respective adaptation policies and measures. It is worth noting that Ministers responsible for SAPs in each sector are required to consult with the Minister for the Environment, Climate and Communications, Minister for Public Expenditure, NDP Delivery and Reform and the Minister for Finance and any other minister as directed by Government in accordance with the Climate Act.

The themes outlined above are themselves cross-cutting in nature, while the sectors will also identify interdependencies across other sectors and therefore engagement across themes and departments is encouraged. In some sectors it is recognised that the lead department will be required to closely collaborate with many other departments and agencies given the diverse range of responsibilities and issues. As previously mentioned, it is recommended that cross-cutting policy issues, Coastal, Urban, and DRR, should be considered within all SAPs where the sector has activities within these environments. The key issue of climate impacts on health should also be considered as a cross-cutting issue by sectors.

In addressing climate change adaptation, it is crucial to recognise not only the interconnectedness of sectors within a single theme, but also the imperative for cross-collaborative efforts between sectors across different themes. This multidisciplinary approach is vital in comprehensively tackling the multifaceted impacts of climate change. For instance, consider the intersection of agricultural policies and flood risk management. The incentivisation of hedgerow and tree planting through agricultural policy is considered an adaptative measure and provides shade and shelter to livestock during periods of extended high sunshine and high rainfall respectively. The planting of trees and hedgerows also sequesters carbon and will positively contribute to the water holding capacity of soils. This is expected to have a positive impact during periods of high rainfall and reduce the occurrences of flood events downstream. Such scenarios underscore the need for a holistic approach in climate change adaptation strategies, where decisions in one sector are informed by and coordinated with the realities and requirements of others, fostering resilience across all fronts.

Given that cross-sectoral elements lack specific departmental assignments, the NASC and the Guidelines for the development of SAPs will promote the incorporation of these considerations into the next iteration of SAPs. The NASC will facilitate inter-sectoral dialogue as necessary and advocate for the integration of specific cross-sectoral actions and considerations in policies and plans.

Table 2: Sectors and Lead Departments

Theme	Sector Level	Lead Department for Sectoral Adaptation Plans	Cross-cutting Policy Issues
Natural Environment	Biodiversity	Department of Housing, Local Government and Heritage	Coastal, Built Environment, Urban Environment, Health impacts, Disaster Risk Reduction
	Water Quality	Department of Housing, Local Government and Heritage	
Built Environment and Infrastructure	Communication Networks	Department of the Environment, Climate and Communications	
	Electricity and Gas Networks		
	Flood Risk Management	Office of Public Works	
	Built Environment and Planning	Department of Housing, Local Government and Heritage[64]	
	Transport Infrastructure	Department of Transport	
	Water Services Infrastructure	Department of Housing, Local Government and Heritage	
Human	Built and Archaeological Heritage	Department of Housing, Local Government and Heritage	
	Health	Department of Health	
Economy	Agriculture	Department of Agriculture, Food and the Marine	
	Forestry		
	Seafood		
	Tourism	Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media	

[64] DHLGH is asked to complete scoping exercise prior to committing to the SAP preparation.

2.7.3 Local and Regional Adaptation

Under the Climate Act, LAs are required to develop Local Authority Climate Action Plans (LACAPs) covering a five-year period in consultation with adjoining LAs and relevant stakeholders. These plans must specify mitigation and adaptation measures consistent with national strategies and policies. The first LACAPs were adopted by all 31 local authorities in early 2024. These plans bring forward adaptation and mitigation measures in an integrated manner, building on work previously undertaken through the development of LA Climate Change Adaptation Strategies, prescribed under NAF 2018. The LACAPs will strengthen the alignment between national climate policy and the delivery of effective local climate action. Importantly, the responsibility for implementing these LACAPs lies with the respective LAs, recognising the unique challenges presented by climate change at the local and community level. These LACAPs will be consistent with the approved national Climate Action Plan and NAF. Following adoption, the plans are valid for 5 years.

The EU Horizon Adaptation Mission focuses on supporting EU regions, cities, and local authorities in their efforts to build resilience against the impacts of climate change. The Mission contributes to putting the EU's adaptation strategy into practice by helping the regions to better understand the climate risks they are faced with currently, and into the future. This allows regions to develop their pathways to be better prepared to cope with the changing climate and deploy on the ground innovative solutions needed to build resilience. The Mission has welcomed the signatures of 308 regions and local authorities which have signed up to the Mission Charter under the EU Mission for Adaptation to Climate Change.

In Ireland, seven local authorities have signed up to this Mission Charter and pledged to develop adaptation and mitigation strategies: Louth, Mayo, Offaly and Sligo County Councils, as well as Cork, Dublin and Galway City Councils. This entitles them to expert advice and guidance through the Mission Implementation Platform and to access funding for innovation activities and pilot projects. Areas of climate change vulnerability are being proactively identified and appropriate resilience solutions implemented.

2.7.3.1 LACAP Guidelines

Under the new provisions of the Climate Act, each local authority is required to prepare a LACAP. To support the development of LACAPs, the Minister for the Environment, Climate and Communications, Eamon Ryan, issued LACAP guidelines to assist local authorities in preparing their local authority climate action plans. These guidelines consist of four key steps: preparing the ground, building the evidence base, developing the framework of climate actions and implementation and reporting. Accompanying technical guidance is

provided on developing and implementing the LACAP, Climate Change Risk Assessment, Climate Mitigation Assessment and Decarbonising Zones.

2.7.3.2 Alignment with SAPs

The alignment between LACAPs and SAPs is of paramount importance to effectively address the challenges posed by climate change. Local authorities play a pivotal role in shaping policies and implementing strategies at the community level, where the impacts of climate change are most strongly observed. As the LACAPs have been adopted and published in Q1 2024, the next iteration of SAPs should align with LACAPs where practicable. This aims to ensure that the broader objectives of these sectors, such as agriculture, infrastructure, and healthcare, are harmonised with local priorities and vulnerabilities.

Furthermore, SAPs are designed to cater to the unique needs and concerns of specific industries. These plans provide vital insights into the sector's resilience and mitigation strategies. Local authorities can serve as the conduits between broader sector goals and localised climate action. Together these collaborative efforts help ensure that climate adaptation efforts are not only effective but also sustainable, ultimately enhancing the resilience and well-being of local communities.

2.7.4 Importance of Nature-Based Solutions

Nature-based solutions (NbS) are important at both sectoral and local levels in the pursuit of climate resilience and should be considered as a part of both SAPs and LACAPs. These innovative approaches harness the power of nature to address climate challenges effectively. For instance, in the agriculture sector, implementing agroforestry practices helps reduce soil erosion, enhances water retention, and provides windbreaks for crops – reducing vulnerability to extreme weather events. Importantly, NbS also provide for cross-sectoral resilience. For example, creating urban green spaces and wetlands lessens the impact of urban stormwater by absorbing excess rainfall and cooling urban areas during heatwaves, while also bolstering a community wellbeing and cultural heritage.

Nature-based solutions offer a sustainable and cost-effective means of adapting to climate change, illustrating their significance in building resilience and safeguarding our communities and sectors against the unpredictable challenges of a changing climate. Sectors should work together to coordinate and collaborate on the integration of effective nature-based solutions that support adaptation and deliver co-benefits for mitigation and biodiversity.

2.7.5 Adaptation Indicators

Monitoring, Reporting and Evaluation (MRE) plays a key role in an iterative adaptation process, enabling adaptation to evolve and improve over time. MRE can support the evaluation of whether a defined objective is being achieved (or not), if measures implemented remain effective and if so, are these measures being delivered in a cost-effective and equitable way.

To support MRE, adaptation indicators will provide a measure to evaluate progress of an adaptation intervention in terms of implementation (process-based indicator). Supported by relevant sectoral bodies (Government Departments, Agencies and Local Authorities), the delivery of the action (output-based indicator) and the outcomes (outcome-based indicator) of the actions in developing resilience at national, sectoral and local scales.

- *Process-based indicators* measure progress in the implementation of adaptation policies, strategies and projects and the allocation of resources.
- *Output-based indicators* measure the direct result of an adaptation policy or action, without assessing whether these result in better adaptation outcomes (e.g., X km of upgraded sea defences).

Outcome-based indicators define the result of an adaptation action, indicating a reduction in vulnerability or increased adaptive capacity.

To support adaptation indicator development, Transport Infrastructure Ireland (TII) is currently completing a project on the development of adaptation indicators. It is planned that the methodology developed through this project will be included in the national sectoral adaptation planning guidelines, and subsequently integrated into the next iteration of sectoral adaptation plans.

2.8 Climate Change Adaptation and Emergency Planning and Management

Adaptation must strike a balance between addressing the more immediate climate change impacts while also planning for a more resilient future over the longer term. The intensifying frequency and severity of extreme climate events requires a robust emergency response planning approach.

2.8.1 Approach to Emergency response management

The National Risk Assessment for Ireland 2023 (NRA) [65] provides the basis on which key risks for the country are identified, prioritised and managed. The objective is to establish a coordinated approach to national risk management. This assessment focuses on 22 key risks, which have been identified as having the potential to trigger a national level emergency. Each of the 22 key risks were analysed by expert focus groups. These expert groups considered the potential impact of climate change for each key risk. The climate change trajectory, which is displayed on the National Risk Matrix, indicates if the risk rating for each risk is likely to increase, decrease or stay the same as a consequence of Climate Change.

The systems approach to emergency management in Ireland, highlighted in Figure 4, involves a continuous cycle of activity. The principal elements of the systems approach are; Risk Assessment, Risk Management, Planning and Preparedness, Response, and Recovery.

1) To protect the public and minimise or prevent damage to property, the economy and critical infrastructure.
2) To provide clear leadership in times of emergency, including arrangements for public safety information.
3) To facilitate timely and effective response through efficient and coordinated operations.
4) To ensure the maintenance of essential services and efficient and timely return to normal conditions.
5) To foster and encourage resilience and community spirit, including supporting the provision of services by the voluntary emergency services and communities affected.
6) To support the safe conduct of emergency response operations through efficient planning and realistic training and exercises.
7) To coordinate the recovery phase of operations, thereby facilitating a timely return to normal life within the shortest practicable timescale.

[65] Department of Defence (2024)

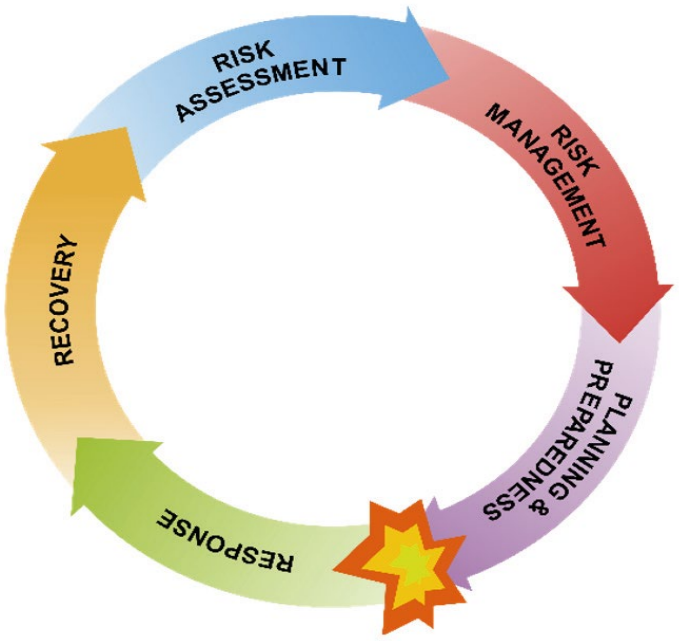

Figure 4 The Five-Stage Systems Approach[66]

2.8.2 Emergency response governance

The Department of Housing, Local Government and Heritage is designated as the Lead Government Department for coordinating the response to severe weather emergencies[67]. The Department's National Directorate for Fire and Emergency Management (NDFEM), headed by the National Director, is mandated by the Secretary General to decide if and when to convene a National Emergency Coordination Group (NECG) on behalf of the Department. The National Director, or their representatives, are also mandated to chair any NECG convened by the Department. The purpose of the NECG is to designate Government-wide support in assisting the local response if required, to coordinate national level issues and to support cross sectoral public safety messaging.

The Department receives detailed severe weather warnings and flood advisories from Met Éireann. When required, the Severe Weather Assessment Team within the NDFEM analyses the weather warnings in further consultation with Met Éireann and uses this information to make decisions on the appropriate actions to take. This includes convening an NECG if deemed appropriate. All weather scenarios are examined on a case-by-case basis

[66] Department of Defence (2017)

[67] National Directorate for Fire and Emergency Management (2023)https://merrionstreet.ie/en/news-room/news/statement_from_national_directorate_for_fire_and_emergency_management.176192.shortcut.html

and all decisions take account of all influencing factors, including for example: geographical location covered by the weather warning, time of day when the weather warning is effective, tidal conditions, river levels, the weather patterns preceding the issuing of the weather warning and flood advisories.

It should be noted that the response to all emergencies in the first instance is, as appropriate, locally led. Local authorities are designated as the lead agency for coordinating and delivering the response to severe weather emergencies and lead the local response in collaboration with the other Principal Response Agencies – An Garda Síochána and the HSE – in accordance with the mechanisms set out in "A Framework for Major Emergency Management" (2006)[68]. Specific guidelines for responding to severe weather events are outlined in Guidance Document 11 A Guide To Flood Emergencies (2024) [69] and "A Guide to Severe Weather Events" (2020)[70]. Local authorities have severe weather sub-plans in place based on this guidance material.

Met Éireann alerts local authorities directly when severe weather is forecast. These warnings and advisories are received by a severe weather assessment team within a local authority. The severe weather assessment team take the appropriate action to scale a response and to ensure that resources are in place to support a response.

In their role as Lead Agency, local authorities carry out a number of functions during the response stage of severe weather and flooding events and deal with recovery issues in conjunction with other responsible agencies. The local authority role includes:

- Coordinating an inter-agency response.
- Continuously monitoring forecasts/alerts/warnings to scale the appropriate response measures.
- Operating flood defences and deploying sandbag defences.
- Clearing debris and fallen trees.
- Flood rescue and pumping water (fire service); and
- Public communication and safety messaging.

[68]National Directorate for Fire and Emergency Management (2006)

[69] It should be noted that A Framework for Major Emergency Management and Guidance Document 11 were under review at the time of publication and are scheduled to be updated by the Department of Housing, Local Government and Heritage.

[70]Department of Housing, Local Government and Heritage (2020)

2.8.3 Integration of Disaster Risk and Climate Change Adaptation into Irish Emergency Planning

Emergency management and climate change adaptation are currently two discrete systems for governance, management and coordination at the national level. There is a need to better integrate emergency response planning with longer-term disaster risk management whilst considering the known and projected risks arising from changing levels of climate change influenced hazards, and community exposure and vulnerability, with their existing and future capacities for service provision and operational responsibilities[71]. Identifying ways to promote coordination and align incentives, priorities and planning processes will facilitate a more holistic and comprehensive approach to disaster risk management at all levels of government.

2.9 Future Research Priorities

Key future research priorities for climate change adaptation in Ireland are likely to evolve in response to emerging challenges. However, some areas that were already recognised as important and are likely to remain priorities include:

- **Climate Impact Assessment:** Ongoing research into the specific impacts of climate change on Ireland, including extreme weather events, sea-level rise, and changing precipitation patterns, will remain a top priority. This research can inform targeted adaptation strategies for exposed and vulnerable sectors such as agriculture, infrastructure, and public health.
- **Ecosystem Resilience:** Understanding how ecosystems respond to climate change is crucial. Research into the adaptation of natural environments, biodiversity, and the sustainable management of natural resources will be essential.
- **Just Resilience:** Focusing on the social aspects of adaptation, research should explore how communities can adapt effectively and identify vulnerable groups and mechanisms to support a fair and equitable approach to adaptation and resilience. Research should focus on vulnerability assessments to identify affected regions,

[71] Environmental Protection Agency (2022)

sectors and communities, mechanisms to embed just resilience in adaptation plans and governance structures to identify and monitor just resilience outcomes.

- **Maladaptation:** Planning for adaptation is an exercise in uncertainty, building upon uncertain information. Research should seek to understanding how maladaptation can take place, the contexts that are prone to such outcomes and the design flaws in strategies that need to be avoided.
- **Infrastructure Adaptation:** Investigating how infrastructure, such as buildings, transportation, and energy systems, can be made more resilient to climate impacts, including retrofitting, sustainable design, and disaster preparedness.
- **Nature-based Solutions:** Widely recognised as an important and effective means to reduce adverse climate impacts, research into the potential for nature-based solutions to offset climate risks will be essential to enable effective implementation.
- **Agriculture and Food Security:** Given the importance of agriculture in Ireland, research into climate-resilient farming practices, crop and livestock management, and the impact of climate change on food security will be critical.
- **Health and Well-being:** Assessing the health implications of climate change, including heatwaves, vector-borne diseases, and mental health impacts, and developing strategies to protect public health.
- **Water Management:** Research into sustainable water resource management, flood control, and improving water quality in the face of changing precipitation patterns.
- **Cross-Sectoral Integration:** Examining how different sectors interact and influence one another in the context of climate adaptation to develop holistic, integrated strategies.
- **Risk Assessment and Early Warning Systems:** Developing advanced risk assessment models and early warning systems to predict and prepare for climate-related events.
- **Climate Communication and Education:** Research into effective communication strategies to raise awareness and educate the public about climate change and adaptation measures.
- **Monitoring and Tracking Adaptation Effectiveness:** Research to develop and implement adaptation/resilience indicators to track climate change impacts, the implementation of adaptation actions, and the outcome or results of adaptation action.

- **Offshore islands and rural areas:** Research exploring the potential impacts of climate change and adaptation options for Ireland's offshore islands and on isolated and sparsely populated rural areas.
- **Transboundary and Cascading Climate Risk:** Research exploring how international and cross-border climate impacts cascade across systems and geographies and how best to manage these risks.
- **Spatial socio-economic vulnerability to climate change:** Research exploring different aspects of spatial socio-economic vulnerability to climate change including investigation into the variability of risk perception and behavioural responses to vulnerabilities.
- **Ensuring mitigation and adaptation are considered together in all instances:** Research focused on the alignment of mitigation and adaptation outcomes at the national, sectoral and local level, including how to effectively integrate adaptation and mitigation considerations into climate-related planning and implementation actions.
- **Legislative barriers to climate adaptation in Ireland:** Conduct a systematic review of legislative barriers to climate adaptation in Ireland, identifying necessary changes to facilitate effective climate action. This includes promoting biodiversity enhancement in new developments, wetland restoration, sustainable forest management through continuous cover forestry, and encouraging nature-positive farming practices while eliminating incentives for environmentally harmful activities, as crucial steps for enhancing biodiversity and climate resilience.

It is important to note that research priorities may evolve as climate science advances and as new challenges emerge. Continued collaboration between research institutions, government agencies, and the private sector is essential in addressing these priorities and ensuring Ireland's resilience to climate change. Furthermore, Ireland would further benefit from an analysis of the key professional disciplines required to support climate adaptation in Ireland, and the specification of a strategy to address those where there is a shortfall in terms of the number of experienced professionals and forthcoming graduates.

Engineers Ireland have reported 70% of the public agree that engineers are critical to combatting climate change, but also report that 72% of employers see the shortage of engineers with the correct skills as the main barrier to business growth[72]. Furthermore, the number of students sitting Leaving Certificate Examinations in STEM subjects decreased by

[72] Engineers Ireland (2023)

7% in 2023, and the number of engineering graduates from Levels 6,7 and 8 degree programmes decreased by 4%.

2.10 Summary

In line with progress made across policy, research and adaptation planning and implementation, this NAF provides stakeholders with a new framework to build on the achievements made to date and strengthen national climate adaptation and resilience.

This NAF establishes a set of key principles to be used when planning for and implementing adaptation. It outlines the importance of mainstreaming climate change adaptation as well as identifying the key government actors with overarching responsibility for managing the NAF. The preceding chapter outlined those stakeholder groups that are integral to facilitating an enabling environment and other factors which further leverage effective adaptation (e.g., financing, research and national planning). The approach to sectoral and local adaptation planning is summarised, including recommendations for improvements. Finally, key research priorities were discussed which are crucial to ensure that Ireland adopts a best-practice approach to adaptation informed by the latest climate research.

Ultimately, this new NAF serves to inform, educate, and equip stakeholders with the necessary information and approaches to mainstream and enable an effective approach to national climate change adaptation.

3 Implementation and Governance

This chapter outlines how the updated NAF will be implemented, revised governance and reporting arrangements, and key actions under the Framework.

3.1 Implementation and Accountability

The Government will, within three months of laying this approved NAF before both Houses of the Oireachtas, request ministers identified within this Framework to prepare adaptation plans for sectors that are assigned to them in accordance with their obligations under the Climate Act and this Framework. These plans will specify the adaptation policy measures the relevant minister proposes to adopt. Once completed, the plans will be submitted to the Government for approval within a specified period. The NAF and the sectoral plans produced under it will form part of an iterative process and will be revised at a minimum of every five years to reflect developments in scientific knowledge and to facilitate the modification and escalation of adaptation actions as necessary.

Strategic and medium-term measures identified in each new iteration of five-year SAPs will be integrated, where appropriate, with actions in the statutory Climate Action Plans. By incorporating actions identified in SAPs into the Climate Action Plan in this manner, the broader national strategy can reflect the evolving needs and challenges faced by different sectors. This process creates a symbiotic relationship where sectoral actions contribute to the overarching national climate goals outlined in the Climate Action Plan, fostering synergy, coordination, and effectiveness in addressing climate change at all levels of governance.

The NAF will be implemented in a coordinated and integrated way, providing coherence, avoiding duplication of effort, and maximising resources. Monitoring implementation and progress will be key aspects of this. Successful implementation of this NAF requires governance structures that will enhance oversight and coordination and be informed by relevant, up to date research and analytical input. Implementation of the NAF will require strong governance and accountability, including oversight by the Oireachtas, independent assessment, advice and recommendations from the CCAC and coordination across Government and with other actors.

Sectoral coordination takes place under the auspices of the National Adaptation Steering Committee (NASC) which is chaired by DECC. The role of this Steering Committee is to ensure good communications between sectors, provide briefings on national adaptation measures, and may assist the relevant sectors in respect of the development of SAPs as required in accordance with Section 6 of the Climate Act. The composition of the Committee

includes the sectors originally mandated under the NCCAF (2012) to undertake SAPs, together with expert support, as necessary, along with other relevant stakeholders (e.g., Department of Finance, three Regional Assemblies and the CCAC Secretariat). The local government sector is represented by the County and City Management Association (CCMA) and the Climate Action Regional Offices (CAROs).

Under Section 15 of the Climate Act, a relevant body shall, in the performance of its functions, have regard to the most recently approved NAF and approved SAPs and may be required to report on progress in meeting the terms of the Framework and sectoral plans.

The CCAC continues to serve as an independent body tasked with the critical responsibility of reviewing progress towards the achievement of the national climate objective through its annual review. This includes engagement and assessment by the CCAC of progress being made toward climate resilience at national level via the annual adaptation scorecards.

The NAF does not provide consent or establish a framework for granting consent and will not be binding on any decisions relating to the granting of consent. The NAF is situated alongside statutory documents that form the framework for future development consent of projects and are subject to requirements relating to environmental assessment/screening for environmental assessment, as appropriate. In order to be realised, sectoral adaptation plans and climate adaptation projects (in a similar way to other plans and projects from any other sector) will have to comply, as relevant, with various legislation, policies, plans and programmes (including requirements for lower-tier Strategic Flood Risk Assessment, Strategic Environmental Assessment, Appropriate Assessment and Environmental Impact Assessment and other licencing requirements as appropriate) that form the statutory decision-making and consent-granting framework.

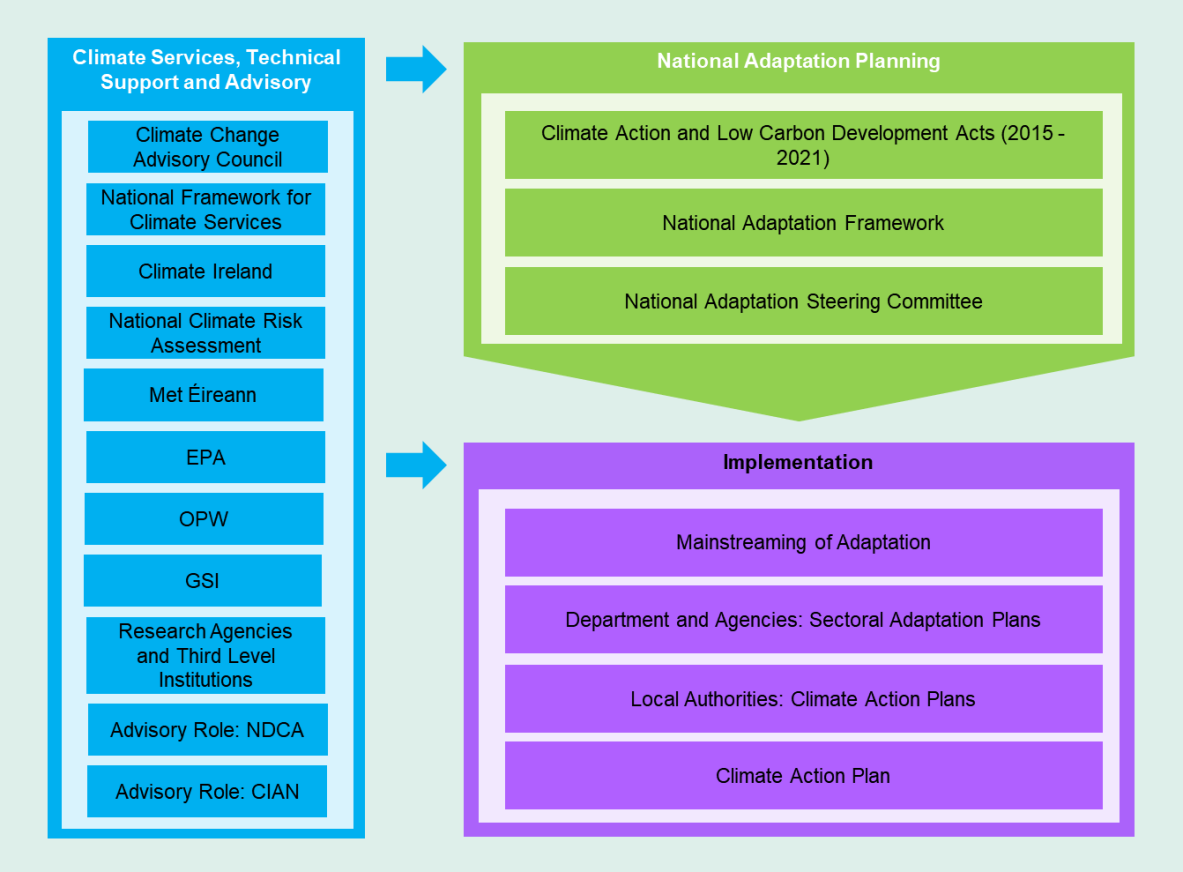

Figure 5 National Adaptation Governance Structure

3.2 Monitoring and Reporting

Monitoring and reporting, review and accountability are central to adaptation governance. At the UN level, the review and reporting arrangements include:

- meetings of Conference of the Parties
- submission of periodic adaptation communications as part of Ireland's National Communications to the UNFCCC under the Paris Agreement
- technical support and guidance provided by the Adaptation Committee
- reports of loss and damage experiences under the Warsaw International Mechanism for Loss and Damage (e.g., by Irish Aid and DFA); and
- review of climate plans including commitments on adaptation, every five years.

At EU level, arrangements include:

- Reporting to the Commission every two years on national adaptation planning and strategies to facilitate adaptation to climate change in accordance with Article 19 of the Climate and Energy Governance Regulation
- Mandatory reporting to the Commission every two years on progress made implementing Ireland's National Energy and Climate Plan (NECP) under Article 17 of the Climate and Energy Governance sharing information through Climate-ADAPT
- Aligning national adaptation plans with the EU Adaptation Strategy and reporting on the progress in implementing the strategy's objectives and actions
- Work carried out by the EEA in the effort to provide overview of adaptation activities and progress at the regional and EU level, offering valuable information for policy review and decision-making; and
- Accessing knowledge base and tools available through the EU Adaptation Mission platform.

At national level and in addition to the oversight arrangements set out above, oversight and reporting will be undertaken through a number of statutory mechanisms including:

- Review by the Minister for the Environment, Climate and Communications of a Government approved National Adaptation Framework not less than once in every five-year period (Section 5 of the Climate Act)
- Submission of an annual report by the CCAC to the Minister for the Environment, Climate and Communications containing findings and recommendations in furthering the transition to a low carbon, climate resilient and environmentally sustainable economy (Section 12 of the Climate Act)
- Submission of a periodic review report by the CCAC (at its own instigation or that of the Minister) to the Minister for the Environment, Climate and Communications (Section 13 of the Climate Act)
- Annual CAP reviews focus on sectoral level actions as part of the national effort to progress adaptation.
- Adaptation elements/actions for CAP quarterly reporting.
- Individual sectors reporting progress through Department structures and annual reports.

The governance framework outlined above describes an open, accountable and transparent process requiring a whole-of-government approach in order to engage successfully in a planned adaptation process involving:

- Sectoral, LA and CCAC participation in developing the draft NAF.
- Public consultation on the draft NAF.
- Approval by Government.
- The presentation of the approved National Adaptation Framework before the Oireachtas; and
- Oversight and review and evaluation of adaptation policy performance and activities by relevant stakeholders.

3.3 Key Actions under the Framework

When crafting adaptation plans, it is essential to consider the SMART framework for setting objectives. Experience gained in recent years by relevant sectors in the development of adaptation actions for the Climate Action Plan should also be a key consideration for the development of sectoral level actions. By ensuring that actions are Specific, Measurable, Achievable, Relevant, and Time-bound, these plans become more robust and effective. Specificity in the actions clarifies their purpose, making them easier to grasp and implement. Measurable criteria allow for tracking progress, enabling organisations to gauge the effectiveness of their adaptation efforts. Achievability ensures that the proposed actions are realistic and within reach, preventing undue strain on resources. Relevance guarantees that these actions align with the broader goals of adapting to the changing environment. Lastly, setting time-bound targets creates a sense of urgency, pushing stakeholders to act promptly and decisively. Embracing the SMART approach in adaptation planning can lead to more resilient and successful outcomes, preparing us to better navigate the challenges posed by a changing world. Lead parties are in charge of determining scale, scope and substance for each adaptation plan and each action outlined in table 3 below.

Table 3 Key actions proposed

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
1	DECC to issue updated National Guidance to Sectors for the preparation of SAPs	Q2 2024	DECC	Adaptation Sectors	• Updated Guidelines issued	• Sectors can utilise new Guidelines that include concepts and principles from the new NAF to develop SAPs
1a	*Include in sectoral guidance a requirement to undertake an analysis of resource and skill gaps as part of sectoral adaptation plan development to identify and prioritise climate adaptation skills, training and re-training needs to address any identified skills gaps*				• *Guidelines to include requirement for SAPs to indicate Number of assessments to be undertaken and number of courses/programmes to be delivered*	• *Skills gaps are identified within relevant Adaptation Sectors* • *Skills gaps are addressed resulting in improved capacity to deliver adaptation*
1b	*Promote in national Guidelines open data sharing within and between sectors, where legally permissible, to assist adaptation monitoring, including climate related risk and losses data, to help support adaptation planning and investment*				• *Guidelines to include requirement for SAPs to indicate shared data available and/or to be examined for sharing potential*	• *Improved evidence base to support planning for and investing in adaptation* • *SAPs to indicate shared data available and/or to be examined for sharing potential*

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
1c	*Include in National Guidelines a requirement in SAPs to improve expenditure and climate impact and adaptation action monitoring systems to allow for better prioritisation of the investment needs of adaptation, assisting to quantify what is required to make Ireland resilient by 2050 and beyond*				• *Guidelines to include requirement for SAPs to include action for Assessment*	• *Targeted investment to priority areas for sectoral adaptation* • *SAPs to include mechanisms for Assessment*
1d	*Introduce in Sectoral Guidelines a requirement that SAPs develop and use appropriate adaptation/resilience indicators to create a fit-for-purpose MERL (Monitoring, Evaluation, Research and Learning) system to monitor implementation of adaptation actions and objectives*				• *Sectoral Guidelines to include a requirement for appropriate adaptation/resilience indicators to be included within SAPs*	• *Creation of a robust MERL system to support an improved evidence base and capacity for progressing climate adaptation/resilience*
2	Government to request Ministers to submit new sectoral adaptation plans aligning with the NAF within a specified period.	Within three months of laying before Oireachtas	Government	Relevant Departments, DECC	• Minister requests submission of updated sectoral adaptation plan	• Strengthened sectoral adaptation approach aligned with up-to-date climate and adaptation science, policy and practice

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
3	Sectoral Ministers to prepare and submit a sectoral adaptation plan to the Government for approval.	Within the period specified by Government	Relevant Departments	Government, DECC, National Adaptation Steering Committee	• Number of sectoral adaptation plans	• Strengthened sectoral adaptation approach aligned with up-to-date climate and adaptation science, policy and practice.
4	Local authorities to adopt LACAPs	2024, and every 5 years thereafter	Local Authorities	DECC, CAROs, CCMA, Relevant Departments	• Number of LACAPs adopted	• Strengthened local adaptation approach aligned with up-to-date climate and adaptation science, policy and practice
5	Local authorities to implement adaptation actions in their LACAPs	Annual	Local Authorities	DECC, CAROs, CCMA,	• Number of actions implemented	• Strengthened local adaptation approach aligned with up-to-date climate and adaptation science, policy and practice
6	Review the National Adaptation Framework approved by the Government not less than once in every period of 5 years	Within 5 years of publication	DECC	Relevant Departments, CCMA, LAs, Agencies Private Sector.	• NAF Review conducted	• National and sectoral approach to adaptation continues to align with evolving climate and adaptation science, policy and practice
7	Review of adaptation progress on local, sectoral and national levels through the adaptation scorecard and annual review process	Annual	CCAC	Government, Local Authorities, LGMA/CCMA, NOAC, DECC,	• Number of progress reports • Progress grade • Publicly available online dashboards	• Transparent independent oversight on progress made on local, sectoral and national adaptation

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
				Relevant Departments	relating to key issues to maintain momentum	
8	Drive community outreach, educating the public on risks, opportunities and impacts of climate change in Ireland and globally	Annual	DECC	Government, Relevant Departments, Civil Society, EPA (NDCA)	• Total funding provided under CAF • Number of consultations and workshops carried out	• Improved public understanding of climate change risks, opportunities to strengthen societal engagement and action on climate change
9	Provide funding to research programmes focused on climate change adaptation – focusing on identified research gaps in this Framework and in the forthcoming NCCRA as well as identified future research priorities	Annual	EPA	Government. Research	• Total funding provided • Number of programmes supported	• Critical research gaps on adaptation are addressed and research findings supporting development of adaptation policy and end user actions
10	Request NTMA to encourage applicants to the Infrastructure, Climate and Nature Fund to consider and incorporate the principles outlined within this Framework in their business cases for funding.	Q4 2024	DECC	NTMA, Adaptation Sectors	• NTMA informed of principles of NAF and relevance to Infrastructure, Climate and Nature Fund	• Improved mainstreaming of climate adaptation in public infrastructure projects

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
11	Develop iterative NCCRA process and associated guidance to underpin sectoral risk assessment and adaptation planning	Q1 2025	EPA	DECC and Relevant Departments	• Iterative process and guidance developed	• Delivery of the NCCRA first iteration output reports and guidance • Establishment of an enduring NCCRA process structure that can be updated iteratively as required
12	Continue to develop Climate Ireland as the National Adaptation Platform, providing services as per its ToR.	Ongoing	EPA		• Number of platform users • Number of registered Climate Ireland Adaptation Network (CIAN) members and annual seminar held	• Inform, educate and build capacity of users to engage with climate adaptation and resilience
13	Met Éireann to develop additional standardised climate information through the TRANSLATE project	Phase 1 - additional projections (wind, relative humidity & solar radiation) to be made available: December 2024 Phase 2 - updated TRANSLATE climate projections in line with latest international standards – (CMIP6	Met Éireann	UCC, MaREI, University of Galway, ICHEC, EPA, NFCS	Additional phase 1 variables and indices to be made publicly available Updated phase 2 projections to be published and communicated	Improved climate data available for adaptation planning Additional standardised variables and indices available in easily accessible formats

Action	Proposal	Timeline	Lead	Other stakeholders	Suggested KPIs	Expected outcome
		& IPCC AR6): February 2026				

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Appendix 2: Climate-related disclosure regulation and standards

EU taxonomy for sustainable activities

The EU taxonomy facilitates a shared, uniform understanding among both financial and non-financial enterprises regarding the categorisation of environmentally sustainable economic activities. This function is significant as it contributes to the expansion of sustainable investments within the EU. By establishing a sense of confidence for investors and safeguarding them against greenwashing, the taxonomy ensures the integrity of sustainable investment. Moreover, it aids companies in their transition toward more environmentally conscious practices, fostering a climate-friendly approach and addressing issues of market fragmentation.

The Taxonomy Regulation came into effect on July 12, 2020. This regulation lays the foundation for the EU's taxonomy by delineating the four overarching criteria that an economic activity must fulfil to be recognised as environmentally sustainable.

The EU taxonomy serves as a crucial framework for identifying and promoting environmentally sustainable activities, playing a pivotal role in advancing climate change adaptation efforts by providing a clear and standardised guide for sustainable investments and economic activities in line with the EU's climate goals.

The Corporate Sustainability Reporting Directive

Emerging from the climate change action goals of the European Green Deal, the Corporate Sustainability Reporting Directive (CSRD) aims to bolster companies' disclosure of climate and environmental data, thereby advancing the commitment to sustainability.

Ireland and other member states have until mid-2024 to transpose the directive, with a view to mandatory requirements commencing for financial years on or after:

- 1 January 2024 for public interest entities in scope of EU non-financial reporting rules (greater than 500 employees)
- 1 January 2025 for other larger companies and public interest entities (greater than 250 employees)

- 1 January 2026 for listed SMEs, with an ‘opt out’ possible until 2028.

Companies in scope will be required to report on a double materiality basis. This means that companies will have to disclose not only the risks they face from a changing climate and other ESG matters (financial materiality), but also the impacts they themselves may have on climate and society (impact materiality). Companies will also have to provide information on their value chain. To assist companies with the transition to the new requirements, for the first three years of reporting, where information on the value chain is not available, they may elect to explain their inability to obtain the information.

CSRD plays a pivotal role in climate change adaptation by fostering transparency and accountability in corporate environmental reporting, thereby providing critical information for informed decision-making, and enabling proactive measures to address the challenges posed by climate change.

International Sustainability Standards Board (ISSB)

In response to the strong demand for the establishment of a high-quality, comprehensive global baseline of sustainability disclosures, the Trustees of the International Financial Reporting Standards (IFRS) Foundation announced the formation of the International Sustainability Standards Board (ISSB). The ISSB is developing standards that will address the fragmented landscape of voluntary, sustainability-related standards and requirements[73].

The four key objectives of the ISSB are:

- to develop standards for a global baseline of sustainability disclosures
- to meet the information needs of investors
- to enable companies to provide comprehensive sustainability information to global capital markets and
- to facilitate interoperability with disclosures that are jurisdiction-specific and/or aimed at broader stakeholder groups.

In June 2023, the ISSB issued its inaugural standards IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures. IFRS S1 provides a set of disclosure requirements designed to enable

[73] IFRS Foundation (2023a)

companies to communicate their sustainability-related risks and opportunities over the short, medium and long term. IFRS S2 sets out specific climate-related disclosures and is designed to be used with IFRS S1. Both standards incorporate the recommendations of the TCFD[74].

[74] IFRS Foundation (2023b)

Appendix 3: Sectoral impacts and opportunities of climate change

Summary of sectoral impacts associated with climate change[75]

Sector	Potential impacts
Forestry	• Projected temperature increases may lead to faster growth rates, potentially impacting wood quality in some species like Sitka Spruce. Additionally, higher temperatures may introduce new pests or diseases, further compounded by climatic stress such as drought and increased temperature. • Projected increase in storm events may cause more windthrow, particularly in forest plantations on exposed, windy sites with poor drainage. Large disturbance events can affect forest age class structure and productivity. • Higher temperatures and moisture deficits may raise the risk of forest fires.
Health	• Projected climate changes, such as increased heavy rainfall and rising sea levels, could lead to more flooding, disrupting lifestyles and health services, and causing direct and indirect health impacts, including mental health issues. • Higher frequencies of extreme precipitation events may result in the increased frequency of water-borne diseases due to drinking water contamination. Warmer temperatures and wetter conditions could also facilitate bacterial growth and viral survival, potentially increasing food-borne diseases. • Heatwaves, which are expected to occur more frequently, may lead to higher heat-related mortality and morbidity. They may also increase exposure to UV radiation, air pollutants, aeroallergens, and the risk of vector-borne diseases.

[75] Sector Adaptation Plans, Climate ADAPT, Climate Ireland, secondary research

Sector	Potential impacts
Water quality and water services	• Projected increases in average temperature and the spread of invasive species may negatively impact the environment and habitats, leading to reduced water quality. • The frequency of droughts is projected to increase and coupled with higher evapotranspiration rates, could cause reduced river flow, groundwater recharge, and reservoir refill capacity, leading to potential water supply shortages. Conversely, high precipitation could lead to elevated pollutant concentrations, particularly nutrients, in rivers, lakes, and coastal waters, contributing to eutrophication and algal blooms.
Agriculture	• Projected temperature increases may lead to a rise in vector-borne diseases affecting livestock, such as the Bluetongue virus, and could impact disease lifecycles and the introduction of new diseases. • More frequent heatwaves may lead to heat stress for both animals and farmers. • Projected decreases in summer precipitation and increased drought frequency will cause water stress for livestock, necessitating changes to grazing protocols and increased silage/meal requirements. Cracked soils may stunt crop growth and limit chemical fertiliser application and reduce efficiency, also posing a risk of exposing groundwater to pesticides. • The increased frequency of extreme precipitation events may lead to soil issues, including decreased trafficability, compaction, erosion, and nutrient and pesticide runoff. Farms and dwellings could face infrastructural damage, and access and transportation may become challenging if storms intensify as projected.
Biodiversity	• Climate change will continue to impact the timing of phenological changes and geographical distribution in Ireland, disrupting ecosystem functioning and species composition. • Increasing winter temperatures may lead to the north-east shifts of Ireland's waterbirds' ranges, including previously rare species like the Mediterranean Gull. Many species and habitats are expected to undergo significant changes in their geographical range.

Sector	Potential impacts
	• Peatlands, especially in low-lying areas of the south and west, may lose suitable climatic areas due to projected changes in temperature and precipitation. Invasive species may thrive, posing competitive pressures on native species. Warmer sea surface temperatures may negatively affect cold-water fish stocks like cod and herring but benefit warmer water species like hake. • Extreme weather events, such as heatwaves, droughts, and storms, may have devastating impacts on Ireland's coastal habitats, affecting foraging birds and altering estuaries' shape. Increased precipitation may impact water quality and fish survival, while temperature changes may increase the occurrence of bog bursts and landslides, indirectly affecting other habitats like lakes.
Built and archaeological heritage	• Climate change is expected to increase flooding frequency, causing damage to built and archaeological heritage, posing health and safety risks, and potentially closing heritage sites. • Storm activity changes will also impact built and archaeological heritage sites, causing structural damage, landscape alterations, and increasing pressure on responding to archaeological finds. • Coastal areas, including major cities with valuable heritage sites, will face adverse impacts from rising sea levels, storms, and storm surge, leading to flooding, erosion, and damage to underwater cultural heritage. • Projected changes in temperature and humidity will favour mould growth, while heatwaves and droughts may increase wildfire frequency, affecting heritage sites and landscapes. Bog bursts are expected to be more frequent, resulting in the loss or damage to archaeological deposits.
Communication networks	• Projected increases in extreme precipitation will raise the risk of flooding, exposing communications infrastructure to damage and disruption. Rising sea levels and intense storms will further threaten infrastructure within proximity to the coast. • More intense windstorms will impact communications infrastructure, and extreme weather events can disrupt access to critical communication facilities.

Sector	Potential impacts
	• Rising temperatures and heatwaves may require additional active cooling for infrastructure (e.g., street cabinets) to reduce or remove heat-related impacts. Currently, passive cooling suffices.
Electricity and gas networks	• Water shortages and drought may affect the availability of cooling at conventional power plants, • Changes in rainfall distribution could reduce hydro power generation during certain seasons, while increasing the role of hydro stations in flood alleviation. • Floods may damage electricity and gas transmission systems, and coastal erosion could impact infrastructure. • Increased wind variability may require backup generation or storage, and strong winds may lead to turbine shutdown or damage.
Flood risk management	• Projections indicate increased storm intensity, more extreme precipitation events, and rising sea levels, leading to more frequent and extensive flooding. This will impact the flood risk management sector. • Existing guidelines adopt a precautionary approach to climate change, reducing potential impacts on future developments. New flood relief schemes include climate change adaptation, but older schemes may currently lack such provisions and will be assessed to plan for their adaptation. • Extreme precipitation events could saturate agricultural lands, affecting drainage schemes. Changes in precipitation may also impact water infrastructure. • Sea level rise and extreme precipitation may damage embankments in estuarine areas, leaving areas behind potentially exposed to coastal flooding. • Accessing hydrometric stations may become difficult due to flooding and sea level rise. Further analysis and resource allocation will be needed to update hazard and risk assessments.

Sector	Potential impacts
Seafood	• Ocean acidity may impact shellfish, reducing seafood production. Changes in sea surface temperature may shift fish stocks, affecting traditional fisheries and introducing non-native species. Altered fish spawning timing may disrupt harvesting. Harmful algal blooms may restrict shellfish harvesting. • Extreme precipitation may flood inland aquaculture facilities, while dry spells reduce water availability for inland aquaculture. Recirculation and oxygenation may be needed. • Sea level rise, storms, and surge events could damage fishing vessels and infrastructure, causing health and safety concerns.
Tourism	• Projected increases in the frequency and intensity of extreme events will impact tourism infrastructure and may impact Ireland's attractiveness as a tourist destination. For example, adverse weather conditions may impact coastal activities such as sailing, hiking and swimming. • Coastal erosion and flooding present risks to Ireland's tourism infrastructure, including vulnerable historic sites and world-renowned golf courses located near coastlines which attract investment and tourism spending.
Transport	• Projected extreme precipitation may increase pluvial and fluvial flooding, impacting the transport sector with service disruptions, hazardous driving conditions, and bridge scour. • Intensified windstorms may disrupt transport hubs, causing delays and cancellations, and affecting transport networks with fallen trees and debris. • Sea level rise and intensified storms may significantly impact transport infrastructure in low-lying coastal areas, eroding coastlines, and estuaries. • Heatwaves and drought may degrade transport infrastructure, affecting road surfaces and rails, and require temperature control measures in hubs.

Sector	Potential impacts
Business, industry & financial	• Changing weather patterns, rising sea levels and extreme events can result in losses due to direct damage to assets and interruption of business activities (before, during and after an event). • The increased frequency and severity of climate impacts and risks may result in increased insurance premiums and costs. • Climate change impacts experienced globally can result in supply chain disruption, resource scarcity and increased costs. • Exposure to climate-related risks, such as stranded assets or credit risks, can impact the stability of financial institutions and investments.

Summary of sectoral opportunities associated with climate change[76]

Sector	Potential opportunities
Forestry	• The expected increase in temperatures will increase the length of the growing season and result in increased tree growth. • Changing climate may enable the planting of less cold-sensitive tree species.
Health	• Warmer winters may reduce the risk of cold-related illnesses, in particular respiratory and cardio-vascular mortality.
Agriculture	• The extension of the growing season due to higher temperatures might result in increased grass yields and earlier harvests for crops, potentially requiring different crop varieties. • The expected decrease in spring frost will result in less frost damage to spring crops, improving conditions for horticulture and reduce cold stress to livestock.

[76] Sector Adaptation Plans, Climate ADAPT, Climate Ireland, secondary research

Sector	Potential opportunities
Built and archaeological heritage	• Warmer temperatures will reduce the risk of cold-related damage to the built environment and archaeological heritage.
Communication networks	• A reduction in snow and ice will reduce the levels of frost and ice damage and associated service disruptions.
Seafood	• Climate change could result in new species for the marine sector as conditions could become more favourable for some high value species such as sea bass.
Transport	• Fewer snow and ice days may benefit the transport sector, reducing service disruptions.
Tourism	• Potential extension of the length of the traditional peak summer tourist season, as well as warmer winters, could reduce the seasonality of tourism, providing more stable employment and income to communities, while also reducing pressure on resources during the traditional peak season. • While competitor destinations across Europe are more exposed to extreme heat, projected increases in the frequency of warm weather in Ireland in the summer months may drive increased demand from overseas tourists and increase the number of Irish holidaymakers choosing to remain within the country instead of travelling abroad. • Adaptation solutions such as nature protection can strengthen and enhance existing tourism destinations and improve the long-term sustainability of tourism businesses and communities that rely on tourism.

Appendix 4: Observed and projected climate change and biophysical impacts for Ireland

Summary of observed and projected climate changes and impacts for Ireland.

Parameter	Observed	Projected	Example of Biophysical Impacts
Temperature	• Annual average surface air temperature has increased 0.9°C over the last 120 years and 0.7°C when comparing the period 1991-2020 to 1961-1990. • The frequency of warm years has increased– with fifteen of the top 20 warmest years on record occurring since 1990.	• Projected that mean annual temperatures will increase by mid-century between 1–1.6°C (under different scenarios). • Projected that heatwave events will increase by the middle of the century with increases in heatwave events ranging from 1-15 (under different scenarios).	• Temperature increases may increase growing rates for forestry and extend the growing season for agriculture. • There is a risk that increased temperatures may also introduce new pests or diseases. • Higher temperatures and moisture deficits may increase the risk of drought and wildfires as well as pressure on water supplies.
Precipitation	• Annual precipitation has increased by 6% between 1989–2018 compared to 1961-1990.	• Projected that there will be substantial decreases in precipitation for the summer months, with reductions ranging from 0% - 17% under different scenarios.	• Decreased summer precipitation and increased drought frequency could result in water stress for livestock and soils.

Parameter	Observed	Projected	Example of Biophysical Impacts
	• Evidence suggests that there is a trend towards increased winter rainfall and decreased summer rainfall.	• Projected that the mid-century precipitation climate will become more variable with substantial increases in the frequency and intensity of dry periods and heavy precipitation events.	• More extreme precipitation events may lead to more frequent and intensive pluvial and fluvial flooding.
Wind Speed and Storms	• No long-term trend in wind speed can be determined with confidence based on the limited analysis carried out to date. • Increasing wave heights have been observed over the last 70 years in the North Atlantic with winter season trends of increases up to 20 cm per decade, along with a northward displacement of storm tracks.	• Projected that mean 10-m wind speeds will decrease for all seasons by mid-century – with decreases largest for summer months (up to 5.4% for the RCP8.5 scenario).	• Changes to storm activity will impact built, archaeological, transport, communication and energy infrastructure – causing structural damage and landscape alterations.
Sea Level and Sea Surface	• Sea level around the coast of Ireland has increased by 2-3	• Projected sea level rise for Ireland shows that areas of	• Rising sea levels will adversely impact coastal areas and may damage

Parameter	Observed	Projected	Example of Biophysical Impacts
Temperature	mm per year since the 1990s. • Average sea temperature has risen by 0.47°C over the last 10 years compared to 1981-2010.	the extreme southwest are likely to experience the largest increases in sea level. • Projected increase in sea temperature around Ireland. Projected changes for the Irish Sea indicate a warming for all seasons with the highest warming in Autumn and the lowest in Spring.	embankments in estuarine areas impacting drainage schemes. • Changes in sea surface temperature may impact fish stocks and introduce non-native species.

Appendix 5: Individual CCAC scorecard SAP progress[77]

Flood Risk Management

The OPW has strong internal structures in place to coordinate the planning, implementation and monitoring of the sector's SAP and wider adaptation actions across the sector. There are effective cross-sectoral working relationships in place as well as leadership buy-in.

The OPW has an online flood mapping portal to support all other sectors and local authorities with understanding both current and potential future flood risk on transport infrastructure connectivity, vulnerability assessment of heritage assets and consideration of future flood risk in spatial planning. The OPW uses a scenario-based approach to flood risk based on increases in fluvial flow and sea level rise as indicators. The Predictive National Flood Risk Assessment, that is due for completion in 2024, considers the existing and potential future impact of flooding across multiple areas such as people, homes, businesses and social and critical infrastructure and the environment.

As with other sectors, staffing is a challenge. Training is in place for OPW staff and staff from other sectors and it is recommended to expand dedicated adaptation staffing given the OPW strategies and programmes developed or forthcoming.

The OPW is focused on mainstreaming adaptation into policy. Examples of this include integrating future flood risk in economic appraisal guidance and embedding the consideration of climate change and adaptation requirements in the design for existing and new flood relief schemes, for which pilot projects have been completed and guidance notes for wider application prepared.

While research and pilot projects are being undertaken with regards to nature-based solutions in flood risk management, these should be explored further and expanded in partnership with other sectors, noting the benefits such measures can have across a range of sectors.

[77] CCAC (2023)

It is recommended that a greater demonstration is provided of the wider impacts of flood relief work provided by OPW. It is important that those most vulnerable to flooding are consulted and that a mix of top-down and bottom-up approaches are used more broadly.

Agriculture, Forestry and Seafood

The sector has also made good progress in terms of mainstreaming adaptation into new policies, planning and financing frameworks. However further outreach and engagement is needed to mainstream adaptation given the number of stakeholders involved and behavioural change needed. Recent policies, plans and strategies for the sector provide examples of mainstreaming adaptation, such as the CAP Strategic Plan (2023-2027) which provides funding for and inclusion of adaptation measures, and the Shared National Vision for Trees and Forests and Forestry Programme (2023-2027).

Furthermore, good evidence has been provided of regular monitoring and review of the SAP implementation and DAFM adaptation actions in NCAP 21 and 23. Significant emphasis has been placed on adaptation across the Agriculture, Forestry and Seafood sectors in recent years, culminating in the publication of the CAP strategic plan, the Forest Strategy, the Seafood Development Plan and the Seafood National Strategic Plan for Sustainable Aquaculture. Part of these strategies/plans is to lay out adaptation measures and actions that can be practically implemented across the sectors and improve their sustainability as well as their resilience to climate change. Significant research funding has also been made available by the Department of Agriculture Food and the Marine, with research teams in UCD, Teagasc, DCU, Bord Iascaigh Mhara and the Marine Institute focusing on adaptation.

Future adaptation work will focus on continuing the mainstreaming of adaptation and improving adoption across all sectors.

Biodiversity

The sector has been identified as having a lack of capacity and programmes in place to monitor SAP implementation. This has been a key challenge for progressing the majority of actions in the SAP. Significant data gaps exist for the sector including an understanding of climate change impacts on biodiversity. Progress has been made in the sector for peatlands, with significant finance mobilised for peatland restoration.

Given the cross-sectoral nature of biodiversity, responsibility for its protection, management and restoration sits across multiple government departments, local authorities, and non-state actors. This coupled with the fact that the National Parks and Wildlife Service (NPWS) is not resourced or empowered to oversee the actions of other sectors remains a challenge. Improved coordination across sectors is increasingly important to reduce or stop further adverse impacts on biodiversity and to leverage the delivery of co-benefits from nature-based solutions and restored ecosystems.

Built and Archaeological Heritage

The sector has taken steps to build knowledge of risks and vulnerabilities and has undertaken practical projects to build resilience of assets to climate change. Key developments for the sector included the appointment of a GIS data manager for hazard mapping and the development of semi-quantitative risk assessment tools.

The sector demonstrated a good overall performance in implementing the SAP, such as the establishment of working groups to drive implementation of the SAP in addition to regular meetings held, communications platforms set up and the appointment of consultants to support the delivery of some SAP work packages.

While staffing is a key constraint for the sector, it has made steps to overcome this challenge through skills development, appointment of critical staff and the use of consultants.

The sector has good evidence of mainstreaming climate change considerations into new policies and into funding schemes and budget structures. Policies, plans, and funding streams identified as mainstreaming climate change considerations include the National Heritage 2030 Plan, National Architecture Policy, and the Built Heritage Investment Scheme.

There is good evidence of improved coordination, collaboration and information sharing with other stakeholders and positive progress in building relationships with other sectors.

The sector has demonstrated work in the area of adaptation and co-benefit such as retrofitting historical buildings, life cycle assessments and the development and certification of suitable retrofitting materials.

Transport

Since the publication of the 2019 Transport Sectoral Adaptation Plan, the sector has made progress in prioritising risks and developing actions to prevent infrastructure damage as well

as bringing research into sector strategies and policies. The sector is undertaking active planning, implementation, and review of the SAP in addition to coordinating broader adaptation actions across the sector. The sector has also made substantial progress in mainstreaming adaptation into appraisal frameworks and across long-term strategies and policies, such as the Transport Appraisal Framework and Transport Infrastructure Ireland Climate Adaptation Strategy. While there is evidence of ongoing projects focused on improving the resilience of the roads and rail networks, funding for adaptation needs to be scaled up. Engagement and improved relations with other departments and agencies is evident.

Challenges for the sector include the range of Transport infrastructure types and modes, and the resulting complexity of varying sub-sectoral and local climate change risk profiles. Variability in the maturity of adaptive capacity across the sector is also a challenge, with opportunities to leverage capacity in individual sub-sectors to support progress across the sector. Funding considerations are also a challenge for the sector, in line with similar challenges identified internationally, with further work to be carried out on increasing the scale and availability of climate change adaptation funding to support implementation.

Electricity and Gas Networks

The Transmission System Operator - EirGrid - and the Distribution System Owner - ESB Networks have identified, categorised, and prioritised risks to the electricity infrastructure in addition to remediation measures for critical infrastructure from flooding and increased storm activity. These results of this work will be included in these bodies capital spending plans for the next Price Review period which will run from 2026 to 2030.

The electricity regulator and the network companies are mainstreaming adaptation into investment planning and project development financial resources are needed to improve the resilience of vulnerable critical infrastructure. The next Price Review will secure the funding needed for this adaptation work.

As with other sectors, a lack of human resources is a challenge and the delay in establishing a new Energy Technical Advisory Division within DECC has hindered some NCAP actions.

The sector provided limited information on the positive impacts or co-benefits from actions. Furthermore, there was a heavy focus on the electricity sector and limited information on resilience issues facing the gas networks sector.

Communication Networks

There is a good understanding of climate change risks facing the communications networks sector, however operators need to access more information on how the sector will be impacted long term by climate change. There is a need to develop meaningful KPIs to allow for better monitoring of SAP implementation and to measure the outcomes and impacts of actions undertaken. Human and financial resources remain a challenge for the sector.

The sector has improved engagement with key external stakeholders following the finalisation of the 'Climate Change and its Effect on Network Resilience' report. Additionally, various power-saving strategies are being implemented to enhance resilience and reduce environmental impacts in electronic communication networks.

Water Quality and Water Services Infrastructure

The overall goal of the adaptation plan for both the Water Quality and Water Services Infrastructure sectors was to present an assessment of key future climate risks to these sectors, while describing the adaptive measures available to build a climate resilient water sector. To this end, a range of adaptation measures were developed by organisations and stakeholders in their future adaptation planning processes. These actions included:

- Fully adopting the 'integrated catchment management' approach.
- Improving treatment capacity and network functions for water services infrastructure.
- Water resource planning and conservation – on both supply and demand sides.
- The inclusion of climate actions in monitoring programmes and research.

The implementation of regulations transposing the European recast Drinking Water Directive was completed in March 2023, which encompass improving and maintaining access to drinking water, risk assessment, water quality monitoring, address water leakages, minimum requirements, and continuous evaluation. In addition, a pilot project, funded by the Department of Housing, local Government & Heritage, has also commenced last year with Cork and Dublin City Councils to investigate how Nature-Based Solutions can be used to address urban run-off pressures. Climate change will make the management of urban water more challenging, especially dealing with more frequent and more intense rainfall in urban areas.

The CCAC identified that progress has been made across the sector in terms of building resilience through collaborative actions with other stakeholders, such as the pilot project on nature-based solutions and references to the ACRES schemes. However, it was noted that the sector needs to improve systematic coordination with the SAP to ensure solutions are implemented at the catchment scale to deliver co-benefits for water quality, biodiversity, and resilience. This could be achieved through the project delivery office being formed for the new River Basin Management Plan implementation.

Key challenges identified included limited progress on understanding of climate change impacts and development of appropriate solutions in the sector, a lack of detailed monitoring of the progress of SAP implementation and the need to develop measurable KPIs, a lack of specific information on the effectiveness of coordination structures in place for SAP implementation, and limited evidence of mainstreaming adaptation across departments, local authorities, and agencies. The CCAC acknowledged that reference was made to relevant plans and policies either developed or under development that incorporate climate resilience aspects including:

- The Fifth Nitrates Action Programme (2022-2025) – designed to prevent pollution from agriculture sources and improve water quality.
- The National Water Resources Plan (under development through Uisce Éireann) and is to outline how Ireland will move towards a safe, secure, reliable and sustainable water supply over a 25-year timeframe. The Plan is expected to include planning for droughts and water scarcity and develop resilient solutions, including smarter supply and demand reduction.

Health

The onset of the COVID-19 pandemic presented a significant challenge to the health sector in the development and implementation of climate adaptation policies but was followed by the successful mainstreaming of climate considerations in both the Department of Health and the bodies under its aegis, chiefly the Health Service Executive (HSE).

The primary focus post-COVID centred on developing governance structures within the Department of Health and the HSE, resulting in the establishment by the former of the Climate Change Oversight Group in 2021 and the publication in 2023 of the HSE Climate Action Strategy which is now being implemented. Both oversight structures have both

Departmental and HSE representation, ensuring coherence both across the health system and with whole-of-Government climate action.

The establishment of these structures is facilitating many climate adaptation actions including: building on a scoping assessment of severe weather events on health infrastructure; development of a public health severe weather public health alert system (similar to UKHSA); the publication of coherent, cross-sectoral guidance in relation to heat waves; supporting the Skin Cancer Prevention Plan; scoping and planning for surveillance of health impacts of climate change; and equipping policy and delivery mechanisms in relation to emerging health threats with information and learning from the climate sphere.

In addition, the health sector is now equipped to engage effectively with cross-sectoral action under the new National Clean Air Strategy and in relation to the development of a National Policy Statement on the Environment. Health considerations are integral to the development and implementation of ambitious policies in both areas and strategic engagement by the sector will support a range of policies in these regards.

Local Government

Progress reports on the implementation of Local Authority Adaptation Strategies are published annually. The latest (2022) report demonstrated that good progress has been made – noting that nearly 89% of local authority actions are ongoing or completed. The Local Authority Adaptation Strategy progress reports are to be superseded from 2024 by reporting for the Local Authority Climate Action Plans.

There is good collaboration on risk identification and measures with many sectors and specific risk identification tools have been developed, including the semi-quantitative climate risk and vulnerability (SQRVA) methodology and the Weather Impact Register (WIRE) App that assists local authorities with recording the impacts of weather events.

Although local authorities are considered to be engaged in planning and implementation climate actions, LA resourcing needs attention. DECC has supported the recruitment of specialist staff to form the nucleus of climate action teams (a Climate Action Coordinator and a Climate Action Officer) within local authorities and has undertaken to fund these positions until 2029, however greater capacity is required.

As per the 2021 Climate Act, the sector is required to take account of Local Authority Climate Action Plans (LACAPs) in their County/City Development Plans to better mainstream climate action. The Local Economic and Community Plans (LECPs) also enable the mainstreaming of climate action into local authority delivery by including a climate focus. Improved collaboration is also needed in relation to the new NAF, SAPs and LACAPs to ensure coordinated action across these plans and frameworks.

National Adaptation Framework

In terms of the NAF, some of the key recommendations provided by the CCAC in its review were for the new NAF to result in a more transformational and smarter, faster and systematic approach to adaptation.

Furthermore, the CCAC scorecard demonstrated that the availability and accessibility of climate data to inform planning and decision making is a challenge for sectors. The National Framework for Climate Services and Climate Ireland are beginning to address this shortcoming. The National Climate Change Risk Assessment will be a key source for sectors in standardising the use of climate data. While the lack of a national set of climate adaptation indicators remains a concern, there is a pilot to develop these with the Transport sector.

In addition, resourcing constraints in agencies under DECC as well as those identified by other sectors for adaptation need to be overcome. There is a lack of detailed information on budget, costs and investment needs for adaptation which must be improved.

The new guidelines developed for the LACAPs, support for CAROs and funding for local authority staffing and training demonstrate the strong coordination and support provided by DECC to local government. The review of the 2018 NAF was commended by the CCAC.

Appendix 6: Comparison between EU policy sectors for adaptation and 2018 NAF sectors[78]

EU Policy Sectors for Adaptation	Corresponding sector in NAF 2018	Included in NAF 2024	Rationale
Agriculture	Agriculture	Yes	Sector previously included.
Biodiversity	Biodiversity	Yes	Sector previously included.
Buildings	No	Yes (as a scoping exercise with Planning)	Buildings are highly exposed to climate change and can be severely impacted. Planning can have a significant contribution to increasing the resilience of the built environment. As such, the built environment will be considered as part of a scoping exercise on potential for a Built Environment/Planning SAP and also as a crosscutting issue across all SAPs.
Coastal	Flood Risk Management, Cross cutting	Yes	Coastal flooding is within the remit of the SAP for flood risk management. Coastal change and erosion affect all sectors with coastal activities and should be considered as a cross sectoral consideration across all SAPs.
Cultural heritage	Built and Archaeological Heritage	Yes	Sector previously included.

[78] Flood Risk Management is not captured on the EU level as a stand-alone sector

EU Policy Sectors for Adaptation	Corresponding sector in NAF 2018	Included in NAF 2024	Rationale
Disaster Risk Reduction	No	Yes	Disaster Risk Reduction falls under remit of several sectors and local authorities; therefore, it is proposed to include it as a cross-sectoral consideration as opposed to a stand-alone SAP.
Business and Industry	No	No	The exposure of the financial sector infrastructure to climate change is low compared to the exposure and vulnerability of the assets they invest in. However, increased awareness of climate change risks, opportunities and adaptation across business, industry and the financial sector is essential as disregarding the implications of climate change can generate significant risks for the financial sector and wider economy (e.g., higher inflation caused by supply chain disruptions and stakeholder pressure to improve corporate responsibility).
Financial	No	No	
Energy	Electricity and Gas Networks	Yes	Sector previously included.
Forestry	Forestry	Yes	Sector previously included.
Health	Health	Yes	Sector previously included.
ICT	Communication Networks	Yes	Sector previously included.

EU Policy Sectors for Adaptation	Corresponding sector in NAF 2018	Included in NAF 2024	Rationale
Planning	No	Yes (as a scoping exercise with Built Environment)	Planning is identified as one of the most effective processes to facilitate adaptation to climate change, particularly in relation to the built environment, therefore Planning has been included as a scoping exercise for a potential additional sector with specific consideration of the built and urban environments.
Marine and Fisheries	Seafood	Yes	Sector previously included.
Mountain areas	No	No	Ireland lacks significant mountain ranges therefore this sector is not considered pertinent.
Transport	Transport Infrastructure	Yes	Sector previously included.
Tourism	No	Yes	Tourism can be impacted by climate change through both directly and indirect impacts. In Ireland, tourism is an important economic and community driver, therefore Tourism has been included an additional sector.
Urban	No	Yes (as a scoping exercise with Built Environment and Planning)	Urban areas are considered particularly exposed and vulnerable to climate change impact, e.g., increased surface water flooding due the high levels of impervious surfaces. A number of sectors have assets and activities located in urban areas, therefore urban areas and associated urban impacts should be considered as a specific part of the scoping exercise on potential for a Planning/Built Environment SAP and also as a cross-cutting issue across all SAPs.

EU Policy Sectors for Adaptation	Corresponding sector in NAF 2018	Included in NAF 2024	Rationale
Water Management	Water Quality and Water Services Infrastructure	Yes	Sector previously included.