
# Summary Report

## Navigating uncertainty in critical infrastructure-focused climate adaptation planning

Aisling Hotel, Dublin

8th April 2025

# Table of Contents

# Summary

The Climate Change Advisory Council's Adaptation Committee held its annual workshop at the Aisling Hotel in Dublin on 8th April 2025, focusing on the topic of navigating uncertainty in critical infrastructure-focused climate adaptation planning.

The workshop included presentations and question and answer discussions with international speakers, an expert panel discussion session, and three interactive breakout sessions. To set the scene a pre-workshop survey asked participants to self-assess their level of knowledge of climate change adaptation and resilience; rank their current barriers to considering climate risk; identify the type of actions they have in place to address climate risk; identify successful approaches when considering climate risk; and indicate what participants would like to get out of the workshop (results of the survey can be found in Appendix 3).

The workshop agenda can be found under Appendix 1. The workshop included a wide range of participants (61 in total) including critical infrastructure representatives, central and local government representatives, and climate service providers. The full list of participants is provided in Appendix 2.

A non-exhaustive selection of key observations arising from the workshop include:

1. Maintaining or improving levels of customer service was identified as one of the main results of successful climate resilience planning. For example, reducing power outage time or disruption to rail services after a storm event.
2. The practical application and potential of the adaptive pathways approach was discussed in the presentation by Dr. Sadie McEvoy and in the following presentation discussion and breakout sessions.
3. The identification of outcome-based indicators, SMART targets, baseline data, post-implementation evaluations, and feedback from stakeholders and communities were seen as essential components of effective monitoring and tracking of progress.
4. Many workshop participants noted that as funding support is needed to undertake longer term interventions that having a legal climate resilience obligation could assist in this regard and help to spur on actions. However, others felt that there is sufficient guidance and targets in place for climate change at the national and EU level and that more clarity is needed rather than more regulation. This key issue needs to be teased out further.
5. The need for a climate infrastructure investment strategy was discussed, along with barriers such as short-term thinking and the lack of an inter-generational vision.
6. Some of the greatest uncertainties identified included ensuring water supply in the context of changing rainfall intensities due to climate change, access to flood insurance, and the unknown costs of adapting flood relief schemes to future climate impacts.

# 1. Overview of Presentations

Prof. Peter Thorne, Adaptation Committee Chair, opened the workshop and welcomed all participants. Prof. Thorne highlighted the impact of Storm Éowyn on critical infrastructure and emphasised the constant calls from the Climate Change Advisory Council's Adaptation Committee (CCAC) for investment and legislation to address the vulnerability and lack of resilience within our critical infrastructure and services in coping with extreme climate events.

Dr Stephen Flood, Resilience Team Lead in the Climate Change Advisory Council Secretariat, introduced the objectives of the workshop and set the scene for the day. His presentation provided an overview of decision-making uncertainty types (including situational, choice related, outcome uncertainty, and temporal uncertainty). Approaches towards uncertainty were also considered and briefly discussed.

Dr. Sadie McEvoy, Senior Researcher at the Deltares Institute in the Netherlands, presented on adaptive pathways planning approaches. She introduced the Dynamic Adaptive Policy Pathways (DAPP) framework[1], designed for decision-making under deep uncertainty. Dr. McEvoy emphasised the importance of developing robust plans that are adaptable over time, ensuring near-term targets are achieved while preserving long-term options. Dr. McEvoy also presented on different levels of analysis, from a qualitative assessment based on narratives, to a more comprehensive model-based assessment. The importance of stakeholder involvement in any assessment process was emphasised. Additionally, she expanded on the application of the DAPP framework in critical infrastructure[2].

Prof. Rob Wilby, Professor of Hydroclimatic Modelling at Loughborough University provided the first case study presentation of the workshop: Acting with uncertainty in the UK water sector. Prof. Wilby shared insights on the historical variability of UK droughts. He emphasised the importance of proactive planning over reactive responses to enhance resilience against future unprecedented events. Referring to the UK Water Resources Planning Guidelines, he explained its required system resilience to withstand a 1-in-500-year drought. Finally, he introduced techniques to enable stress-testing of system resilience against unforeseen weather extremes[3].

Dr. João Rego, Disaster Risk Management Consultant at the World Bank, presented the second case study of the workshop: Achieving Successful Adaptation in Coastal Communities. Dr. Rego shared four case studies of funding initiatives provided by the World Bank (WB) and the World Meteorological Organization (WMO) for coastal protection across the globe:

- a regional initiative promoting the Blue Economy, which involved flood hazard and risk studies in São Tomé and Príncipe[4],

[1] Haasnoot, M., Warren, A., Kwakkel, J.H. (2019). Dynamic Adaptive Policy Pathways (DAPP). In: Marchau, V., Walker, W., Bloemen, P., Popper, S. (eds) Decision Making under Deep Uncertainty. Springer climate. https://doi.org/10.1007/978-3-030-05252-2_4

[2] Dynamic Adaptive Policy Pathways | Deltares

[3] Wilby, R.L. (2022). Stress-Testing Adaptation Options. In: Kondrup, C., *et al.* Climate Adaptation Modelling. Springer Climate. https://doi.org/10.1007/978-3-030-86211-4_6

[4] World Bank, 2024. "Island Insights: Surging Seas and Increasing Rains — Analyzing Flood Risks in São Tomé and Príncipe, District by District." Washington, DC: World Bank. Available from: https://storymaps.arcgis.com/stories/2b69b33c3c75482b86ec985e1dca6f49

- a grant following a severe tropical cyclone in Comoros, which focused on Disaster Risk Management (DRM), Early Warning System (EWS) assessments, and multi-hazard studies,
- an emergency response loan provided after Hurricane Beryl in Barbados, which supported national needs assessments,
- a 'Call to Action' from the UN aimed at protecting everyone with early warning systems in Mozambique, including a four-pillar framework (risk knowledge, hazard monitoring, communication, and preparedness).

Dr. Rego concluded by addressing common challenges across these projects, such as overcoming cultural differences or aligning project timelines with government commitments to invest in adaptation measures.

## 2. Summary of Presentation Discussions

The following main points were discussed in response to the presentations given by the invited experts.

The difficulty of taking investment decisions that yield benefits over long time horizons was discussed. Although business case development and decision-making frameworks are unique across different sectors, investment into grid infrastructure in Ireland is funded through the prices paid by customers and that it is particularly difficult to sell the idea of resilient infrastructure in the future by forcing customers to pay for it in the present. This was considered a difficult issue. However, the importance of not ignoring the likelihood of all critical risks and possible scenarios when taking investment decisions was emphasised to avoid paying even higher transfer costs in the future.

The complexity of the adaptive pathways approach was discussed and its potential application beyond an academic approach. The underlying reasons behind the approach were also discussed, including how it relates to the precautionary principle and whether it can be intended to reduce risks to ecosystems and human lives as well as to the economic impacts of damage. It was acknowledged that the approach can appear to be academic but that the main idea behind it is quite simple and intuitive and that it seeks to practically operationalise the concept of risk management into planning and decision-making frameworks and decisions.

The computational requirements for dynamic adaptive pathways planning were discussed and it was concluded that the DAPP approach does not require high computational requirements. It is used with existing systems but is simply a case of running more scenarios through them.

It was noted that the DAPP approach can be applied across different sectors and contexts. It emerged in the Netherlands due to the existential threat that sea level rise poses to that country and that this prompted considerable investment and thinking into how to adapt the country quickly enough to present and future changes.

There was a discussion on the need for regulation to promote adaptation planning in Ireland. It was noted that considerable work had gone into the security of water supply in Ireland since the heatwaves and droughts of the 1970s but that the country not been able to become more resilient

to these events. It was stated that this poses a significant cascading and compounding risk to other sectors and it was queried if regulation is needed to ensure greater resilience to climate change impacts. The presenter indicated that the UK regulatory requirement to be resilient to one in five-hundred-year drought events[5] had led to technical challenges in understanding but had focused minds and attention among water companies to examine the impact of climate change. It was suggested that it also provides a framework to plan for and that it has played an important role in enhancing climate resilience in the water sector in the UK.

## 3. Panel Discussion Summary

A panel discussion took place to explore a range of Irish perspectives on planning for climate uncertainty. The following panel members took part in the session:

- Sean Laffey, Director of Asset management and Sustainability, Uisce Éireann
- Paul Hendrick, Director of Capital Investments, Iarnród Éireann
- Neil Keegan, Head of Asset Management, Eirgrid Group
- Conor Galvin, Flood Risk Management Engineer, Office of Public Works
- David Owens, Principal Officer for Climate Finance and Sustainable Finance, Department of Finance

The panel first discussed if there is a need for guidance or legal direction to assist them in planning for climate uncertainties.

Divergent views were expressed on the need for additional legislation to help support critical infrastructure resilience actions. The first was that there is sufficient guidance and targets in place for climate change at the national and EU level and that more clarity is needed rather than more regulation. However, others (supported by breakout session discussions) felt that as funding support is needed to undertake longer term interventions that having a legal climate resilience obligation could assist in this regard and help to spur on actions.

It was stated that Irish utilities are aware of the different Representative Concentration Pathways (RCPs) and available models, and that each are building resilience into their infrastructure projects and operations although they may be using different targets and approaches. The EU Taxonomy Regulation and Corporate Sustainability Reporting Directives were highlighted as important for standards and planning for adaptation investments. It was observed that each infrastructure sector is different and that it is valuable to know the vulnerabilities of a company's assets and to plan accordingly for both short-term and longer-term scenarios.

On the need to finance long-term adaptation intervention measures, different existing and possible future approaches were discussed. The importance of integrating adaptation projects into the National Development Plan was noted as well as other potential sources of Government funding include the Sovereign Green Bonds, carbon tax, the Infrastructure, Climate and Nature Fund and the EU Recovery and Resilience Facility. In the area of electricity infrastructure, it was

[5] A one-in-500-year event means that in any given year, there is a 1-in-500 chance (or 0.2% probability) of it occurring. In UK, water companies are currently required to plan to ensure resilience to a 1-in-500 year 'extreme' drought. Government resilience: extreme weather - Committee of Public Accounts

noted that the regulator offers financial incentives to hit certain targets and that these targets could be linked to climate resilience and adaptation. The importance of not underestimating climate costs was emphasised, particularly bearing in mind the cascading impacts from extreme weather events. The context facing Ireland of huge infrastructure gaps and deficits, growing population and economic activities, and uncertainty around corporate tax income were all considered risks to making the case for financing adaptation projects and the need for a climate infrastructure investment strategy was suggested.

Each of the utilities stated that they are adapting to climate change and integrating resilience into their infrastructure and operations due to the high level of exposure to climate risks. Climate change adaptation is now being designed and built into existing and future flood relief schemes based on flexible adaptation pathways. Issues of uncertainty around data, need for changes in product standards, time horizons for planning interventions, upgrading existing assets and infrastructure while trying to minimize outages and delays in planning were noted as some of the challenges facing the utilities.

The session concluded with each of the utilities identifying some of the greatest uncertainties that concern them. These included access to flood insurance, water supply in the context of changed rainfall intensities and amounts due to climate change, uncertainties around the costs of adapting flood relief schemes to cope with climate change, continued short-term thinking and the lack of inter-generational vision, economic uncertainties and risks around new technologies, and whether these will assist us to withstand future changes.

# 4. Summary of Breakout Sessions

Three breakout sessions were held where attendees (broken into 10 table with an average of 8 participants) detailed discussions of particular issues outlines below. The following recorded discussion points were captured from facilitator notes and post-it notes generated by workshop participants. Each session was between 30 and 40 minutes in length. A non-exhaustive compilation of comments from the discussions is provided.

## Breakout Session One

In the first breakout session, **participants discussed what successful climate resilient planning could look like.**

Maintaining or improving critical levels of customer service was identified as one of the main results of successful climate resilience planning. Investments in infrastructure and operations should incorporate the consideration of climate modelling and projections and identify appropriate thresholds. It should ultimately result in less vulnerability and disruption to critical services, less time for recovery of services and reduced need for emergency response during and after extreme weather events. Successful resilience planning should be characterised by clear targets, goals and indicators for resilience parameters, failure thresholds and regular monitoring and review of implementation. Practical examples of successful climate resilient planning include:

- Happy and healthy communities - people, places and infrastructure protected from the effects of climate change
- Large scale and nationwide restoration and increased areas of land for biodiversity conservation as well as widespread use of nature-based solutions
- Quick and efficient response and preparation for extreme weather events that results in no loss of life, assets that are protected, and the minimisation of liabilities and losses
- Robust supply chains
- Future proofing and lack of maladaptation (e.g. in urban dwellings)
- Resilient transport – mobility of people and critical freight flows and protecting assets
- Avoidance of shocks and crisis

Several participants expressed their view that climate resilient planning requires clear and concise guidance from national government. This would promote a common understanding of climate risks and allow all stakeholders to plan to a similar level of future scenarios, thresholds, timeframes and impacts (e.g. planning for a 2°C world by 2050 and 4°C world by 2100 as well as specified precipitation levels). It could also play a role in mobilising investment in adaptation measures and several participants noted the need for a dedicated climate resilience fund from central Government. The consultation needed for this guidance could result in valuable conversations around trade-offs, the costs of inaction and generate public buy-in and momentum for climate resilient measures. It was also encouraged to build in safety nets to any guidance given the possibility that mitigation targets may not be reached globally. All stakeholders were suggested to inform themselves about the National Climate Change Risk Assessment as a starting point for risk-based planning.

It was observed that successful climate resilient planning requires strong leadership and buy-in from top management at organizational level, coordination and integration of multiple stakeholders, and engagement with the public to ensure buy-in. Participants felt strongly that climate resilient planning needs to be supported by a robust evidence base. A centralized data modeling system was recommended to facilitate data sharing, to aid consistency and to avoid everyone working in their own silo. The need for a climate damage register was also suggested to build evidence around the costs of extreme weather events.

Participants then discussed how resilience planning differs from business-as-usual planning.

It was considered that resilience planning takes longer-term timescales and horizons into consideration so that business as usual or better is possible in future. Business as usual planning takes a short-term approach and is more reactive with annual funding cycles. It also takes a more tactical and operational approach rather than long term strategic planning.

Climate resilience planning is a risk-based planning framework that includes consideration of uncertain scenarios and promotes flexibility in planning for future unknowns. It also prioritizes multi-annual funding for necessary interventions, considers avoided costs and ensures investment in necessary human resources. It stress-tests potential solutions against scenarios and also involves the regular review and updating of risks. It differs from business-as-usual planning in that it recognizes cascading and compounding climate risks and the need to address these in a coordinated and integrated approach.

It was considered that resilience planning looks both back based on historical data and forward based on modeling and projections. Business as usual planning tends to be based on historical events and does not take into account future projections. Climate resilient planning promotes science and longevity over shorter-term profit motives and decision-making that is based on cost-benefit analysis. It is particularly suited for infrastructure development as most infrastructure needs to be durable and last for a long period.

Climate resilient planning gives better consideration to the design standards of assets and equipment, which need to consider climate change.

The third question in the breakout session focused on the barriers to resilience planning.

Several participants highlighted the lack of capacity and resources for climate change adaptation. It was considered that there are not enough people with adequate knowledge, expertise and skills relating to climate change adaptation. There are particular skills gaps relating to developing and operationalising the dynamic adaptive pathways approach. The lack of skills is compounded by insufficient coordination and political will. It was noted that the need for climate resilient planning requires coordination between public and private entities, across government departments and with local authorities and that there is a lack of human resources across Government to provide the necessary coordination. Competing government priorities, short-term political horizons and the need to address immediate challenges at national and local level were all considered barriers that require political leadership and vision to ensure that adaptation measures are given high priority.

Inadequate funding for infrastructure projects and maintenance was referenced as a key barrier. The absence of information on the financial and economic impacts of climate change and underestimation of the financial risks from climate change were observed challenges. Other barriers linked to funding included the potential to be called out for over investment in absence of visible long-term gain, affordability of investment in electricity infrastructure as any investments made today for later will be borne by the customer and the need for the public spending code to take better account of climate resilience. Opportunities to combine spending on cross-sectoral risks are considered limited as institutions want to spend on something they can see.

It was considered that either legislation, guidance or regulation is needed to assist stakeholders to plan for climate adaptation. Standardised thresholds, scenarios and timelines that companies and infrastructure-owners should plan for are needed. At the broader level, there is a lack of clear plans and targets for adaptation projects set out in the National Planning Framework, Regional Spatial Economic Strategies, Development Plans and Local Area Plans. This absence of targets and indicators linked to climate resilience and the absence of a specific equivalent to sectoral emissions ceilings in climate adaptation was considered a key challenge.

It was felt that massive data and knowledge gaps exist relating to adaptation. While some data sources are shared, many are owned by certain stakeholders only and access is constrained. The robustness of data for planning purposes and investment decision-making is a common challenge. There is a need to better model projections around high impact and low likelihood extreme events. The usability of existing data was considered a challenge. Difficulties in obtaining data on avoided costs was also noted as was the lack of data on the costs and

impacts from extreme weather events. It was noted that there is no register of critical infrastructure in Ireland.

Buy-in for resilience from stakeholders, public and industry needs to be secured. It was noted that there are different and opposing interpretations of what resilience is among a variety of stakeholders. Fear and resistance to new technologies and approaches that disrupt the status quo and ask people to change habits were considered barriers. Planning system-related delays to critical infrastructure projects and issues around land ownership and objections were referenced as common challenges. A programme of community engagement on issues of climate change adaptation and resilience was recommended.

## Breakout Session Two

In the **second breakout session**, participants discussed potential improvements to their current risk management approach.

The first question asked: **Is climate change considered in your current risk management approach how could it be improved, and if it's not currently considered how could it be?**

Participants emphasised the need for enhanced collaboration across sectors and external stakeholders to improve data sharing and reduce siloed information. Increased confidence in mapping risks, greater community engagement, and more funding were also highlighted as potential improvements. Concerns were raised about high-level documents being too vague for practical implementation, calling for more specific guidance and mainstreaming efforts. Additionally, participants identified the need for better understanding of cascading and transboundary risks. NCCRA, TRANSLATE, and taxonomy guidelines were recognised as valuable resources for standardising risk management practices. Participants also discussed the importance of integrating risk assessments into decision-making processes and having senior management buy-in.

The second question asked: **What internal supports and/or resources are needed to progress climate resilience planning in your sector/remit?**

Participants agreed that legal, regulatory, and climate expertise were essential, along with the retention of qualified personnel and an increase in adaptation and resilience experts in technical roles. Additionally, the importance of access to case studies, EPA resources, and research publications across departments was emphasised, as well as the need to provide resilience training for civil servants at all levels.

## Breakout Session Three

The first question asked: **What are near-term options or low regret options to help mitigate current climate change impacts?**

Nature-based solutions were emphasised across all discussion groups for their multiple benefits in flood management, biodiversity, and carbon sequestration. Community resilience was also a key theme, with calls to empower local hubs, educate the public, and support vulnerable groups.

Near-term options discussed included accelerating the adoption of renewable energy, electric vehicles, heat pumps, and retrofitting. It was mentioned that recovery and emergency planning could be reinforced by learning from past lessons and improving monitoring. Improved data collection, asset mapping, forecasting, CSRD reporting, and regular risk assessments were seen as essential for informed decision-making. Finally, participants stressed the importance of strong leadership from government and corporate sectors, public engagement, collaboration on projects to ensure maximum benefits, and the timely implementation of adaptation strategies.

The second question asked: **What are some of the longer-term adaptation options that might need to be kept open?**

Infrastructure resilience was a recurring theme, with suggestions to rebuild critical facilities such as schools and hospitals and adapt ports and transport systems. Sea-level rise adaptation options were also discussed, with considerations of managed retreat, tidal barriers, NBS coastal defences, and large-scale grey infrastructure projects. Participants mentioned the need to address cross-sectoral challenges such as the housing crisis, emerging health threats, and agricultural pressures. Finally, the urgency of responding to climate risks in an exponential and anticipatory way was stressed, rather than a linear and reactionary one. It was also considered beneficial that this besupported by increased investment, more regulations that reflect climate change, enhanced institutional and corporate knowledge, and a clearer strategic vision.

The third question asked: **How can adaptation actions and their effectiveness best be monitored over time?**

Participants identified outcome-based indicators, SMART targets, baseline data, post-implementation evaluations, and feedback from stakeholders and communities as essential components of effective monitoring and tracking progress. It was also noted that metrics such as the duration of service disruption, the number of insurance claims and the costs avoided as a result of resilience measures would be valuable. Participants highlighted the importance of continuous learning from past events through attribution studies, historical comparisons, and the use of risk and damage registers. There were also calls for greater reflection on outcomes and the impacts on vulnerable communities. Ultimately, it was mentioned that regular reporting cycles, such as SAPs and scorecards, are necessary to identify gaps and adjust strategies over time.

## 5. Conclusions & Way Forward

Participants were invited to reflect on the workshop at the end of the day before the closure of the workshop. Next steps post-workshop included the distribution of presentations from the speakers, dissemination of the workshop report, and the commissioning of a research study building on the key messages of the workshop.

# Appendix 1: Workshop Agenda

**Navigating uncertainty in critical infrastructure-focused climate adaptation planning**

**Tuesday, April 8th, 2025**

**Agenda**

| Time | Item | Speaker/s | Time (mins) |
|---|---|---|---|
| 9:30am | Tea and Coffee | | |
| 10:00am | Welcome & housekeeping | Prof. Peter Thorne, Chair of Climate Change Advisory Council Adaptation Committee | 10 |
| 10:10am | Setting the Scene – Considering adaptation planning with uncertainty in critical infrastructure | Dr Stephen Flood, Resilience Team Lead, Climate Change Advisory Council | 15 |
| 10:25am | Introduction to adaptive pathways planning approaches | Dr. Sadie McEvoy, Senior Researcher, Deltares, The Netherlands | 20 |
| 10:45am | Case study Example I Acting with uncertainty in the UK water sector | Prof. Rob Wilby, Professor Hydroclimatic Modelling at Loughborough University | 20 |
| 11:05am | Questions and discussion | Prof. Rob Wilby & Dr. Sadie McEvoy | 15 |
| 11:20am | Breakout session I | Decision making context | 30 |
| 11:50am | Coffee | | 15 |
| 12:05pm | Case study Example II - Achieving successful adaptation in coastal communities: case-studies from around the world | Dr. João Rego, Disaster Risk Management Consultant, World Bank | 15 |
| 12:20pm | Breakout session II | Taking action | 40 |
| 1:00pm | Lunch | | 50 |
| 1:50pm | Panel Discussion | Panel discussion focused on decision making for climate | 45 |

| | | | |
|---|---|---|---|
| | | with uncertainty – Uisce Éireann, Irish Rail, Eirgrid, OPW, Department of Finance | |
| **2:35pm** | Breakout session III | Taking action continued | 30 |
| **3:05pm** | Overview of breakout discussions | Summary of breakout discussions and overview of key common issues raised. | 15 |
| **3:20pm** | Next steps and close | The secretariat will produce a workshop report to feed into the sectoral adaptation plans and in general adaptation planning.<br><br>What is needed to improve decision making under climate uncertainty and advise government.<br><br>The Secretariat will also be commissioning a targeted research piece to help advance the topic with a focus on policy relevance. | 10 |
| **3:30pm** | Close | | - |

# Appendix 2: Workshop Participants

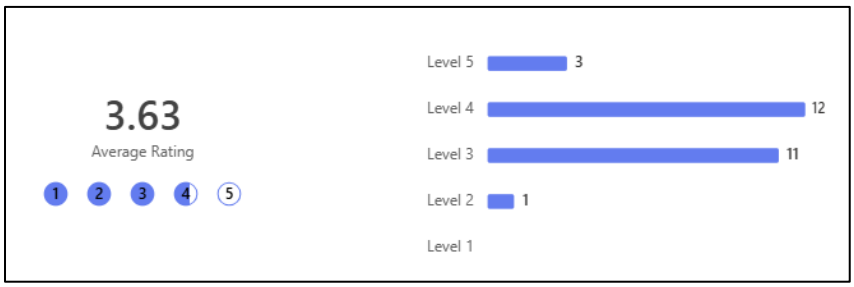
| | Name | Organisation |
|---|---|---|
| 1 | Andrea Carroll | Dublin Airport Authority |
| 2 | Andrea Lennon | Department of Transport |
| 3 | Ann-Maree Manley | Department of Agriculture, Food and the Marine |
| 4 | Averil Gannon | Department of Housing, Local Government and Heritage |
| 5 | Caoimhe Currie | Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media |
| 6 | Claire Scannell | Met Éireann |
| 7 | Colm O' Looney | Department of Environment, Climate and Communications |
| 8 | Conor Galvin | Office of Public Works |
| 9 | Conor Quinlan | Environmental Protection Agency |
| 10 | David Owens | Department of Finance |
| 11 | Dervla McAuley | Environmental Protection Agency |
| 12 | Eavan Crehan | NewERA, National Treasury Management Agency |
| 13 | Fergal Dalton | Department of Agriculture, Food and Marine |
| 14 | Fintan McGrath | Department of Transport |
| 15 | Glenn Nolan | Marine Institute |
| 16 | Gregory Murray | Department of Transport |
| 17 | Jerome O' Sullivan | Port of Cork Company |
| 18 | Jillian Mahon | Climate Change Advisory Council and Adaptation Committee member |
| 19 | John McNamara | Bord na Móna |
| 20 | John Spink | Teagasc |
| 21 | John Stack | Dublin City Council |
| 22 | John Uhlemann | Department of Environment, Climate and Communications |
| 23 | Katherine Dooley | Environmental Protection Agency |
| 24 | Keith Lambkin | Met Éireann |
| 25 | Kerstie Flanagan | Gas Networks Ireland |
| 26 | Kevin McCormick | Department of Environment, Climate and Communications |
| 27 | Lisa O'Sullivan | NewERA, National Treasury Management Agency |
| 28 | Liz Cribbin | Greyhound Racing Ireland |
| 29 | Mark Byrne | AirNav Ireland |
| 30 | Martyn Byrne | NewERA, National Treasury Management Agency |
| 31 | Michael Goan | The Land Development Agency |
| 32 | Neil Keaveney | TG4 |
| 33 | Neil Keenan | EirGrid |
| 34 | Oisín Boland | Waterford City and County Council |
| 35 | Paul Brosnan | Department of Health |
| 36 | Paul Hendrick | Iarnród Éireann |
| 37 | Peter Thorne | Chair of Adaptation Committee and Climate Change Advisory Council member |

| | | |
|---|---|---|
| 38 | Ray Nesbitt | Department of Agriculture, Food and the Marine |
| 39 | Robert Devoy | Adaptation Committee member |
| 40 | Robert Tucker | ESB Networks |
| 41 | Rory Hinchy | Department of the Environment, Climate and Communications |
| 42 | Rory Leahy | Bus Éireann |
| 43 | Rory Sheehan | Louth County Council |
| 44 | Seosamh Ó' Laoi | Department of the Environment, Climate and Communications |
| 45 | Shane Regan | National Parks and Wildlife Service |
| 46 | Stephanie Born | Bord na Móna |
| 47 | Stephen Smyth | Transport Infrastructure Ireland |
| 48 | Tara Higgins | Environmental Protection Agency |
| 49 | Tea Connolly | ComReg |
| 50 | Tim Kavanagh | ESB Networks |
| 51 | Vincent Sheehan | Bus Éireann |
| 52 | Yvonne Cannon | Dublin CARO |
| 53 | George Hussey | CCAC Secretariat Manager |
| 54 | Ben Macfarlane | CCAC Secretariat |
| 55 | Bryn Canniffe | CCAC Secretariat |
| 56 | Ciara Hilliard | CCAC Secretariat |
| 57 | Claire Camilleri | CCAC Secretariat |
| 58 | Eleanor Mathews | CCAC Secretariat |
| 59 | Marta Carrasco | CCAC Secretariat |
| 60 | Phillip O'Brien | CCAC Secretariat |
| 61 | Stephen Flood | CCAC Secretariat |

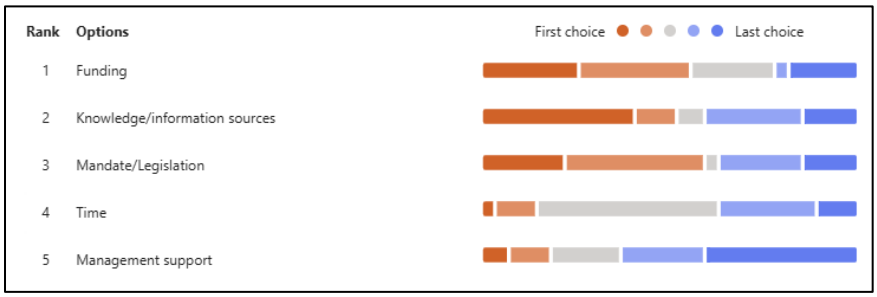
# Appendix 3: Pre-workshop Survey Results

There were 27 responses to the pre-workshop survey.

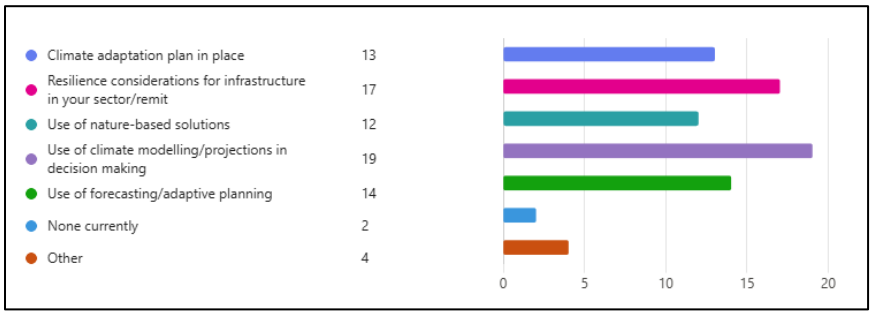
1. How would you rate your knowledge of climate change adaptation/resilience on a scale of 1 to 5, with 5 being the highest?




2. What are your current barriers to considering climate risk (adaptation and resilience) in your sector/remit? List/rank in order of importance.




3. What type of actions (if any) do you have in place to address climate risk (adaptation and resilience) in your sector/ remit? Select all that apply.



4. Can you detail any successful approaches to considering climate risk (adaptation and resilience) in your sector/ remit?

| Number | Comment |
|---|---|
| 1 | Not based in a sector or local authority - provider of adaptation information. |
| 2 | We will be starting the EU funded Climaax project for risk modeling. |
| 3 | Use of Met Eireann TRANSLATE data. Refer to National Adaptation Framework (NAF) 2024 guidance. Cross sectoral fora and discussions. |
| 4 | All new port infrastructure is designed to account for climate change according to the latest standards/projections. |
| 5 | Design standards have been changed to account for climate change. |
| 6 | NBS inclusion in Flood Relief Schemes, Scheme Adaptation Plans for old schemes. |
| 7 | Climate risk and vulnerability assessments at early project stage to inform design development for resilience |
| 8 | Review of Critical Infrastructure: Assessing stadium vulnerability to climate impacts such as extreme weather, flooding, and heat stress, ensuring that key assets remain operational. Biodiversity Action Plans |
| 9 | Currently revising SAP which is due September 2025 this will incorporate findings of NCCRA. Climate resilience tool pilot project presented at National Ploughing Championship 2024. |
| 10 | Promotion of NBS |
| 11 | Climate change risk matrix; Cooperation between OPW, Insurance Ireland and the Central Bank of Ireland in addressing Ireland's flood protection gap; Ireland's Sovereign Green Bond Framework, with over €200m allocated towards climate adaptation projects. |
| 12 | The current NAF and sectoral guidelines cover climate risk and we work with the EPA (and other stakeholders) to develop an effective NCCRA which will then inform SAPs and ultimately the next NAF. |
| 13 | NCCRA work has helped clarify thinking about climate hazards, exposure and vulnerability. |
| 14 | While the HSE's remit is to protect, improve and promote the the health and wellbeing of the population, Public Health has been defined as "the science and art of preventing disease, prolonging life and promoting, protecting and improving health through the organised efforts of society" (Acheson, 1988), and it is very challenging to organise the efforts of society from within the HSE without support from other parts of society. While public health is increasingly on the agenda of others, it is extremely slow and is not serving the public interest very well. |
| 15 | Rail company coastal and flood mitigation measures. Bus company depot infrastructure planning. |
| 16 | Carrying higher levels of conserved forage as a buffer for dry summers or longer wetter winters |
| 17 | PR6 submission to CRU |
| 18 | Provision for adaptation in capital works (Adaptation Plan for capital works) |
| 19 | EirGrid have a number of initiatives to take into account climate risk, 1. Shaping Our Electricity Future Initiative, EirGrid has developed the "Shaping Our Electricity Future" roadmap, which outlines strategies to integrate renewable energy sources and enhance grid resilience. This plan includes comprehensive engagement with communities, industry stakeholders, and local authorities to ensure a secure |

| | |
|---|---|
| | transition to a low-carbon electricity system. 2. Asset resilience projects to minimise risk of climate change on existing assets including flooding. 3. Resilience and Emergency Planning To maintain a secure power system amid increasing climate-related disruptions, EirGrid has established robust resilience and emergency planning protocols. This includes continuous monitoring and balancing of electricity supply and demand as an example transmission systems response to storm Eowyn. |
| 20 | Airports have very long been considering resilience and putting in place extreme weather / extreme conditions planning. This is typically not flagged as climate risk as it has been done for a long time. Looking at what is in place first and what would help address Climate risk is a good first step |
| 21 | To be a key contributor at national groups e.g. NCCRA, NFCS, CIAN. To conduct a quantative scenario modelling risk assessment. |
| 22 | Conducting, overheating & flood risk assessments and CRVA's on projects at design stage to inform design decisions |
| 23 | TSAP 2 Planning (current), Climate Vulnerability Risk Assessment at company level (24/25) |
| 24 | Site Acquisition Flood Risk Assessments |

5. Please indicate what you would like to get out of the workshop.

| Number | Comment |
|---|---|
| 1 | Would like to learn how the actors in the space are planning for the future and implementing. |
| 2 | A better understanding of translating risk into adaptation planning for infrastructure |
| 3 | Networking with officials working on adaptation in other organisations. Knowledge sharing. |
| 4 | Increased knowledge and ideas from other sectors |
| 5 | Sectoral engagement |
| 6 | Good techniques to deal with the uncertainty of climate change and how it can be used in our sector. Any good examples of countries that have implemented good adaptation measures that have shown positive results. |
| 7 | Would like to be able to gauge what best practice looks like |
| 8 | Help in identifying decision support tools or climate risk assessment methodologies that could help GRI navigate uncertain climate projections when planning infrastructure investments and operational strategies. Examine successful case studies where infrastructure owners have implemented adaptation measures despite uncertainty. A clearer understanding of national climate policy expectations around resilience planning for venues and how compliance frameworks e.g. CSRD align with adaptation efforts. |
| 9 | More information on adaptation planning and how to consider uncertainty |
| 10 | To gain insight into how other sectors are embedding adaptation. |
| 11 | Particularly interested in case study examples |
| 12 | Better insights into how evidence will be used to inform climate decision making. |
| 13 | How to effectively organise the efforts of society for the public interest of people's health and wellbeing in an effective and timely manner |
| 14 | Broader understanding of the key issues. Data on expected climate trends and impact scenarios. |
| 15 | Better understanding of how sectors are dealing with uncertainty in planning adaptation |
| 16 | to get a better understanding of what other companies are working on for Climate adaptation |
| 17 | Other approaches |
| 18 | Latest Understanding of Climate Risks and Challenges, Funding and Policy Opportunities and Cross-Sector Collaboration and Stakeholder Engagement |
| 19 | Open and unbiased listening / sharing of information |
| 20 | Collaboration or establishment of "mini working groups" to feed into the wider knowledge bank. |
| 21 | A view on appropriate modelling scenarios/ weather files to use. View on the national approach and mandate to perform certain minimum assessments at appropriate stages |
| 22 | Guidance on revising Climate Adaptation Plan to align with CSRD/ESRS requirements, building on what is already in place |
| 23 | Approach to identifying climate thresholds |