

2022

Climate Research in Ireland 2022

2022 Climate Research Highlights¹

183 new research projects funded

€79.8m in competitive funding awarded



€40m EU funding leveraged by Irish researchers



€5.1m for new EU LIFE projects

€3.2m on core (in-house) research activities by state bodies

€4.6m in co-funding by CRCG members

¹Reporting Period January to December 2022. Figures represent data submitted by CRCG member organisations and include both climate and climate-related research activities.

Overview

The Climate Research Coordination Group (CRCG) supports and promotes coordination and knowledge exchange between state bodies involved in funding climate research in Ireland.

The group is coordinated and chaired by the EPA and has 29 member organisations consisting of research funding organisations, state agencies and government departments, listed in Appendix I.

29

member organisations



This report, the fifth of its kind, provides an update on climate research funding administered by CRCG member organisations in 2022. Some key activities of CRCG members in 2022 are also highlighted. The report is based on information provided to the EPA by the following CRCG members:

- Central Statistics Office
- Department of Agriculture, Food and the Marine
- Department of the Environment, Climate and Communications
- Department of Foreign Affairs
- Department of Transport
- Enterprise Ireland
- Environmental Protection Agency
- Irish Research Council
- Marine Institute
- Met Éireann
- National Transport Authority
- Office of the Planning Regulator
- Science Foundation Ireland
- Sustainable Energy Authority of Ireland
- Teagasc
- Geological Survey Ireland

Overview

The data presented in this includes both:

Climate research

which contributes directly to our understanding of climate and how it is changing; and

Climate-related research

which includes research on the impacts of climate change in different sectors and solutions to address it.



All data used to compile the report will be made available on the **EPA's National Climate Research Database** where it can be filtered and exported.

In 2022, CRCG members awarded €79.8m in competitive funding for 183 projects in climate and climate-related research. Considering only climate research, 34 projects with a value of €26.3m were awarded in 2022. This corresponds to an increase of €2.2m on 2021 and represents the most spent on climate research in Ireland since the EPA began collating and reporting this data in 2018.

Of the total investment in climate and climate-related research, €4.5m in co-funding was provided by CRCG members and €13.8m by non-CRCG members including the National Monuments Service, Health Research Board, County Councils and private industry. CRCG members also carried out €3.2m in climate research in-house within their organisations in 2022.



In 2022, CRCG member organisations awarded

€79.8m

for 183 projects in climate and climate-related research.



Overview

Overview

Climate Research Funding in Ireland

Selected Highlights for 2022

Appendix

Researchers in Ireland secured approximately €40m for climate and climate-related research under relevant Horizon Europe funding opportunities in 2022, as part of international collaborative projects worth about €380m.

A limited analysis of research outputs reveals an increase in both climate and climate-related publications over the last five years.

Selected highlights from 2022 are outlined, which includes new funding initiatives, some key project outputs and events related to climate research.

Climate research is essential to advancing our understanding of global, regional, and local climates and how they are changing, and to inform effective mitigation options, adaptation responses and opportunities for societal transition across all sectors of our economy and society. The urgent need for Ireland to expand and enhance research capacity in these areas requires sustained upward investment in climate and climate-related research.

€40m

in EU funding leveraged by researchers in Ireland for climate and climate-related research



Climate research is essential to advancing our understanding of global, regional, and local climates and how they are changing



Climate Research Funding in Ireland

A total of €26.2m was invested in 34 projects in climate research in 2022 (Figure 1). This represents an increase of €2.2m on the same figure in 2021, and the highest in the reported figures since 2018.

Considering both climate and climate-related research in 2022, 183 projects were awarded to an amount of €79.8m, which is €20.7m less than in 2021. It is evident from Figure 1 that total investment in climate and climate-related research has fluctuated significantly over the last five years², from a low of ~€20m in 2020 to a peak of €100m in 2021. The large increase in 2021 can be attributed to an expansion in the scope of what was counted as 'climate-related research'. The fluctuations also reflect very large single awards in certain years, for example for SFI Research Centres and SFI Strategic Partnerships.

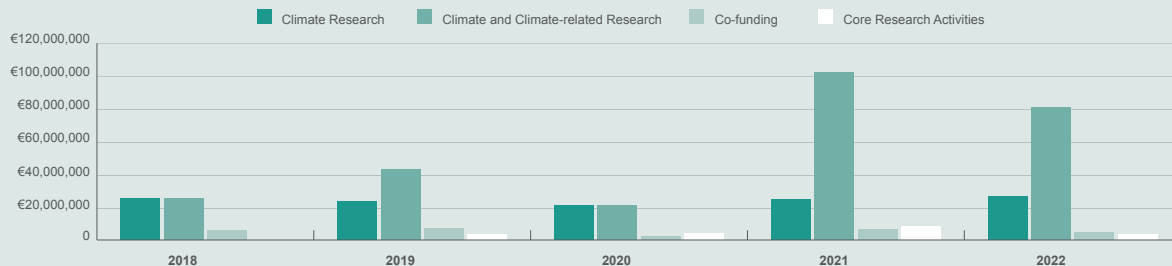


Figure 1 shows the budget committed by CRCG members for new competitive research awards in climate and climate-related research in 2022. It also shows the amount of co-funding supplied by non-CRCG members in 2022.

²Scope of what constituted 'Climate-related Research' was expanded significantly in 2021. Core Research Activities were not recorded in 2018.

€26.2m
invested in 34 projects in climate research in 2022

+9%
since 2021

€79.8m
invested in climate and climate-related research in 2022

-21%
compared to 2021

Climate Research Funding in Ireland

Figure 2 shows the budget committed by CRCG members for new competitive research awards in climate and climate-related research in 2022. It also shows the amount of co-funding supplied by non-CRCG members, which included the National Monuments Service, Health Research Board, County Councils and private industry.

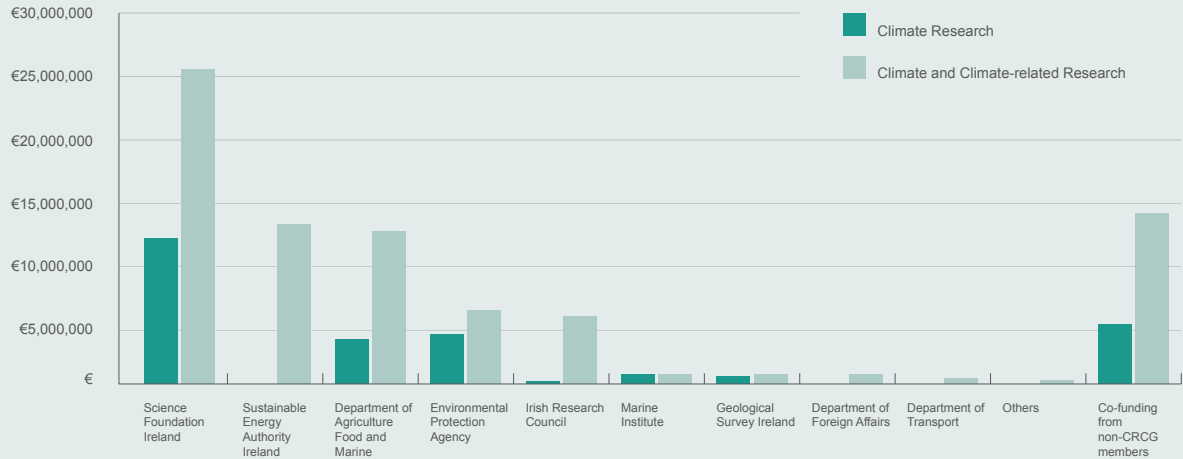


Figure 2 Budget committed by CRCG members for new competitive research awards in climate and climate-related research in 2022. Co-funding supplied by non-CRCG members is also shown.



Climate Research Funding in Ireland

Research Funding by Thematic Area

Figure 3 illustrates the breakdown of new competitive climate research awards in 2022 by thematic area. 'Climate solutions, transition management and opportunities' was the most highly funded thematic area in 2022, accounting for €11.9m. This represents a significant increase of ~€4.6m compared with 2021. The second highest awarded thematic area was 'carbon stocks, GHG emissions, sinks and management options', which received €9.9m in 2022 (~€2m less than in 2021). €4.1m was awarded in the thematic area of 'Ireland's future climate, its impacts and adaptation options', an increase of ~€1m on 2021. Finally, in the 'air science' thematic area, €350k was awarded in 2022, a decrease of ~€1.2m on 2021.

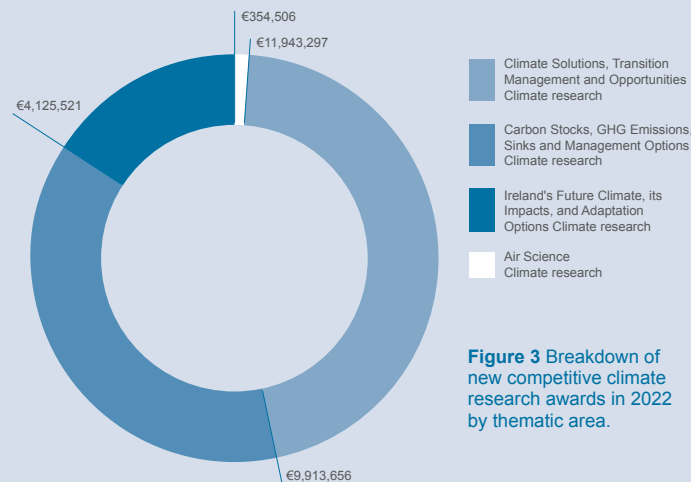


Figure 3 Breakdown of new competitive climate research awards in 2022 by thematic area.

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'carbon stocks, GHG emissions, sinks and management options' received

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in 2022

€4.1m

was awarded in the thematic area of 'Ireland's future climate, its impacts and adaptation options'

'air science' thematic area awarded

€350k

Climate Research Funding in Ireland

Research-performing Organisations

University College Dublin (UCD) received the most funding through competitive research calls in 2022 for climate and climate-related research (Figure 4). Notwithstanding that a significant amount of this was for a single award (€16m for the Next Generation Energy System (NexSys) SFI Strategic Partnership Award), as indicated by shaded area in Figure 4, UCD still represented the most successful higher education institution in 2022, followed by Teagasc, Maynooth University and University College Cork. UCD was also the most highly funded research body when considering only climate research. This ranking is the same as that seen in 2021.

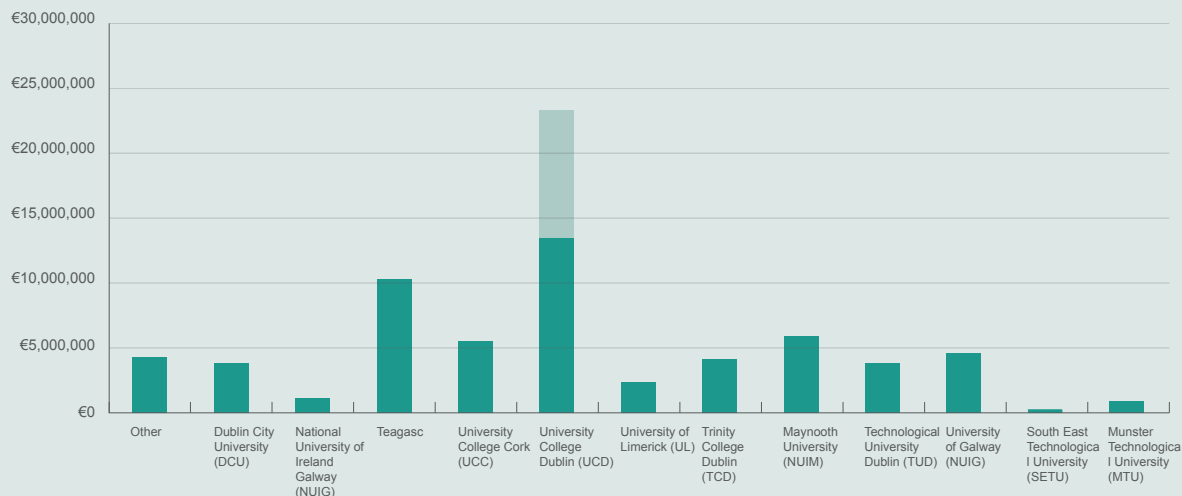


Figure 4 Total budget awarded in 2022 per receiving lead research-performing organisation through new competitive funding in climate and climate-related research.

Climate Research Funding in Ireland

Awards by budget size

Of the 183 new climate and climate-related research projects funded in 2022, 61 were smaller projects in the <€100k range. This is almost twice as many as in 2021. The average funding award in 2022 was €364k, while the median funding award was €194k. This represents a decrease from the 2021 average and median awards values, reflecting the larger number of smaller projects awarded in 2022. There were 26 projects awarded in the €500k - €1m range in 2022, up from 10 in 2021.



Figure 5 Distribution of new competitive climate and climate related research awards in 2022 by budget size.

61

Out of the 183 projects funded in 2022 are in the <€100k range

The average funding award in 2022 was

€364k

The median funding award was

€194k

There were 26 projects awarded in the

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range in 2022

Climate Research Funding in Ireland

Research publications

Publications are a key research output and indicative of the level of research activity in a given area.

Figure 6 shows the total numbers of publications including authors in Ireland over rolling five-year periods for climate and climate-related research based on a bibliographic analysis³. The trends show increases in the numbers of publications in both climate and associated research areas over the period 2018 to 2022.

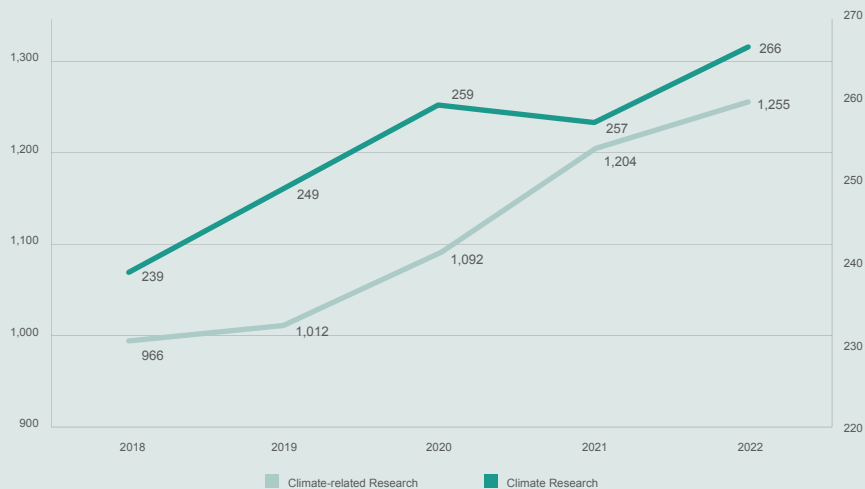


Figure 6 Number of climate and climate-related publications over preceding 5-year period that include authors in Ireland.

³Data was gathered from Incites (Clarivate Analytics) on 12 October 2023 and includes Articles and Reviews. The classifications used were based on the Australian and New Zealand Standard Research Classification, which is the basis for Research Classification Ireland. Climate-related Research includes all publications under the broad Level 1 Field of Research Classifications: Environmental Sciences (41) and Earth Sciences (37). Climate Research includes only publications under the more detailed Level 2 Field of Research Classifications: Climate change science (3702) and Climate change impacts and adaptation (4101).

Climate Research Funding in Ireland

Research publications

Climate and climate-related researchers in Ireland engage strongly in international collaboration, as shown in Table 1 by the high proportion of publications involving authors from multiple countries. Normalised Citiation Impact is a useful indicator of the impact of publications, with values greater than one indicating that climate and climate-related researchers in Ireland are performing above average for this metric.

Table 1: Numbers of research publications including authors in Ireland and associated bibliographic metrics in climate and climate-related research.

Publications in 2022	Number of Publications	Citations	% cited	Normalised citation impact	% international collaborations
Climate-related Research (Level 1 Classification: Environmental and Earth Sciences)	223	1,011	80%	1.38	84%
Climate Research (Level 2 Classification: Climate change science, and impacts and adaptation)	56	177	84%	1.16	85%

Climate Research Funding in Ireland

European research funding

In 2022, Ireland was successful in receiving a total of 62 grants under Horizon Europe calls in Clusters 5 and 6 of Pillar 2, which represent the subject areas of Climate, Energy, Mobility, Food, Bioeconomy, Natural Resources, Agriculture and the Environment (comparable to climate and climate-related research)⁴. These awards represent a total of almost €40m for Ireland and are part of international projects worth €381m (Table 2).

Table 2: Funding awarded to Irish researchers in climate and climate-related Horizon Europe funding calls in 2022.

	Signed Grants	Funding for Irish Partners	Total Project Funding
Climate	7	€3.57m	€102.8m
Climate, Energy and Mobility	25	€13.32m	€148.5m
Climate, Energy and Mobility; Food, Bioeconomy, Natural Resources, Agriculture and Environment	62	€39.56m	€381.2m

⁴The data shown was gathered from the [Horizon Europe Dashboard](#) on 29 September 2023. The data corresponds to grants issued through calls issued in 2022 (grants may have been signed in 2023) and only includes calls under Pillar 2 "Global Challenges and European Industrial Competitiveness". Climate refers to calls specific to climate science (HORIZON-CL5-2022-D1-01-two-stage, HORIZON-CL5-2022-D1-02, HORIZON-CL5-2022-D2-01, HORIZON-CL6-2022-CLIMATE-01); Climate, Energy and Mobility includes all calls in 2022 under Cluster 5; Climate, Energy and Mobility; Food, Bioeconomy, Natural Resources, Agriculture and Environment includes all calls under Clusters 5 and 6.

Climate Research Funding in Ireland

European research funding

As shown in Figure 7, Ireland collaborated with a wide range of countries under Horizon Europe calls in 2022, with the highest levels of collaboration with France, the UK, Spain and Germany.

As well as Horizon Europe, CRCG members also secured €5.1m in EU LIFE funding in 2022.

CRCG members secured

€5m

in EU LIFE funding in 2022

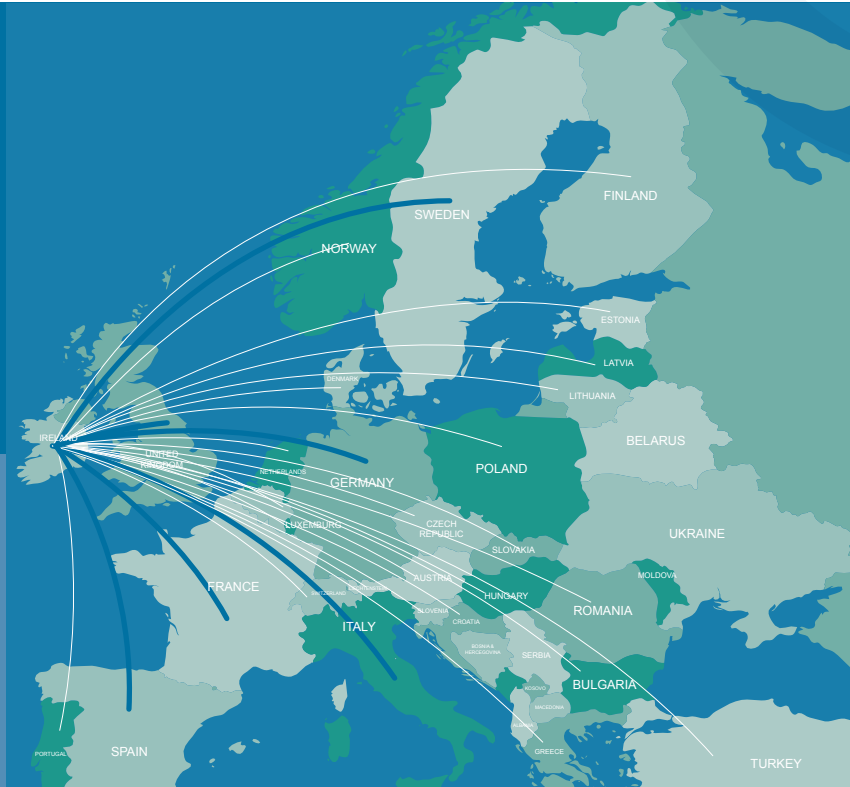


Figure 7 Irish collaboration with European partners in climate and climate-related research in 2022.

Selected Highlights for 2022

For full highlights provided by CRCG members, please see the Supplementary Information document available for download.

Climate Research Classification

In 2022, the CRCG convened a subgroup of its members to input to the development of Ireland's first National Research Classification System. The group identified appropriate classifications for climate and climate-related research in an Irish context. **Research Classification Ireland** was published by the Department of Further and Higher Education, Research, Innovation and Science in July 2023. The new classification system will enable reliable comparison of research statistics and data nationally, as well as help with the development of standardised reporting and benchmarking.

Policy & Strategic Studies Research Call

The Department of Agriculture, Food and the Marine established a new research initiative to address short- to medium-term policy and strategic needs in September 2022. **The Policy and Strategic Studies Research Call** aims to support research that expands the evidence base for the department, informing and supporting the development of policies across the agri-food, forest, and biobased sectors. Twenty topics were included in the first call, ranging from climate, pesticides and forestry to animal health and welfare, the bioeconomy, and women in farming. Some €4.2million for 19 new policy-focused research projects **was awarded through this call.**

National Challenge Fund

Science Foundation Ireland (SFI) continued to grow its Challenge funding portfolio in 2022, including prize awards in the SFI **Plastics** and **Food** Challenges, and a new **SDG Challenge** in partnership with the Department of Foreign Affairs to develop solutions in a variety of areas including addressing climate change. The **National Challenge Fund** was also launched, with €65m available to accelerate solutions for key challenges in the areas of Green transition and Digital transformation, to be awarded through eight competitive calls, with the first calls launched in 2022.



Selected Highlights for 2022

Co-Centres Call for Climate and Sustainable Food

A new **Co-Centres Programme** launched in October 2022 which aims to bring together leading academic and industrial researchers, across Ireland, Great Britain and Northern Ireland. The call represents an investment of €74 million to create two new collaborative research centres in the areas of climate and sustainable food systems. The call will be managed by SFI, Northern Ireland's Department of Agriculture, Environment and Rural Affairs (DAERA) and UK Research and Innovation (UKRI).

The Co-Centres call represents an investment of

€74m

to create two new collaborative research centres in the areas of climate and sustainable food systems.



Ireland's Climate Change Assessment

Commenced in 2021 and coordinated by the EPA, **Ireland's Climate Change Assessment (ICCA)** was progressed significantly in 2022. It will consist of four volumes:

Science: Ireland in a changing world.

Achieving climate neutrality by 2050.

Being prepared for Ireland's future climate.

Realising the benefits of transition and transformation.

The ICCA will update our national understanding of climate change, its impacts and response options and inform policy options in climate mitigation and adaptation, as well as identify associated evidence gaps and research priorities. CRCG member organisations participate on Steering Committees guiding all aspects of this initiative, and financial support for author teams is being provided by the EPA, SEAI, SFI and the Department of Transport. The ICCA will be published in early 2024.

Selected Highlights for 2022

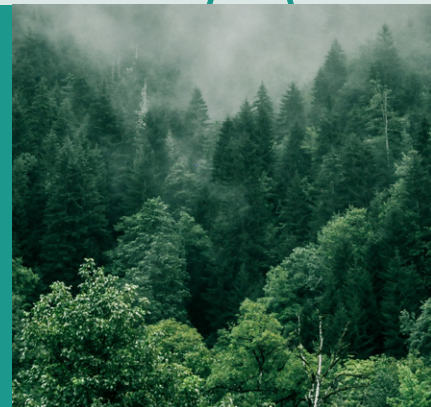
Environmental Science to Policy Seminar

The EPA organised an inaugural Environmental Science to Policy seminar in October 2022. The seminar's objective was to explore how best to improve the delivery of evidence and knowledge to the policymaking system. The event brought together policymakers, knowledge transfer practitioners and scientists from across government and academia to share experiences on the issues, constraints, good practices and ways forward. The **Seminar Reflections Paper** captures the key themes and recommendations that emerged during the seminar, to support and inform the national Science to Policy agenda.



Historical Climate Data Rescue Project

The CSO continued work on a **Climate Data Rescue** project, which involves rescuing detailed daily weather data for around seven weather stations across Ireland for the period 1870-1959. Data cover variables such as air and grass temperatures, air pressure, humidity, wind force and direction, cloud formation, rainfall and sunshine hours. In 2022, CSO completed work on quality checking the Blacksod Bay series starting in 1884 before moving on to the Roches Point series starting in 1873. Eventually, each weather station will have a longitudinal file of quality checked data made available to Met Éireann.



Selected Highlights for 2022

Core Research

As well as awarding funding through competitive calls and partnerships, a number of state bodies conduct essential in-house research related to climate. For example, Met Éireann has ongoing research activities in areas including climate modelling, climate services development and coordination, production of climate monitoring indices and products, flood forecasting capability building, national climate and environmental monitoring, and management of the National Destination Earth Coordination Group. Similarly, GSI conducts internal research activities that continue to provide key national datasets and products to support climate-related research, as well as participating in international and national projects that improve our understanding of Earth systems and the impact of climate change.

€4.3m

spent on core
research in 2022



Planning and Climate Change Study

In March 2022, the Office of the Planning Regulation (OPR) published a Case Study Paper on **Climate Action and the Local Authority Development Plan**. The paper examines the influence that climate change is having on planning policy in Ireland and offers insights into the challenges local authorities experience when incorporating climate mitigation and, particularly more recently, climate adaptation measures into the planning process.



Selected Highlights for 2022

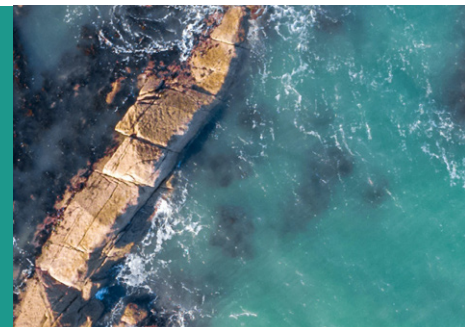
Horizon Europe Missions

Under Horizon Europe, EU Missions are a new way to bring concrete solutions to key global challenges. Four of the five Horizon Europe Missions are of direct relevance to climate change and there was considerable activity in these novel initiatives in 2022.

The 15-person Mission Boards were announced and included **Prof. Shane Ward (UCD) being selected for the Adaptation to Climate Change Mission Board** and **Dr. Peter Heffernan on the Mission Board for Healthy Oceans, Seas, Coastal and Inland Waters**. Ireland also hosted the launch event for the Atlantic and Arctic Lighthouse for this Mission in Cork in November 2022 which was attended by President Michael D. Higgins.

Dublin and Cork were selected to become part of a network of 100 cities across Europe in the Climate-Neutral Smart Cities Mission. In 2022, **a national mirror group was established** to maximise Ireland's participation in the 'A Soil Deal for Europe' Mission.

Funding has also been secured through the initial Horizon Europe Mission Funding Calls, for example, by the Marine Institute in the **BlueMissionAA project**, which will Build a Coordination Hub to Support the Mission Implementation in the Atlantic and Arctic Basin.



Four of the five Horizon Europe Missions are of direct relevance to climate change, and there was considerable activity in these novel initiatives in 2022.

Appendix

Members of the Climate Research Coordination Group

Central Statistics Office

County and City Management Association

Climate Change Advisory Council

Department of Agriculture, Food and the Marine

Department of Enterprise, Trade and Employment

Department of the Environment, Climate and
Communications

Department of Foreign Affairs

Department of the Taoiseach

Department of Tourism, Culture, Arts, Gaeltacht,
Sport and Media

Department of Transport

Enterprise Ireland

Environmental Protection Agency

Health Service Executive

Irish Environmental Network

Irish Research Council

Uisce Éireann (formerly Irish Water)

Marine Institute

Met Éireann

National Parks and Wildlife Service

National Transport Authority

National Treasury Management Agency

National Economic and Social Council

Northern Ireland Environment Agency

Office of the Planning Regulator

Office of Public Works

Science Foundation Ireland

Sustainable Energy Authority of Ireland

Sustainable Northern Ireland

Teagasc

Geological Survey Ireland

Acknowledgements

The EPA would like to acknowledge the contributions of the Climate Research Coordination Group members in the preparation of this annual report for 2022 and thank all organisations who provided the data included in this report.

Disclaimer

Although every effort has been made to ensure the accuracy of the material contained in this report, complete accuracy cannot be guaranteed. The EPA, the Climate Research Coordination Group and the authors do not accept any responsibility whatsoever for loss or damage occasioned, or claimed to have been occasioned, in part or in full, as a consequence of any person acting, or refraining from acting, as a result of a matter contained in this report.

