An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

The Department of Environment, Climate and Communications Research and Innovation Survey — Public Consultation

Fields marked with * are mandatory.

An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Department of the Environment, Climate and Communications Research and Innovation Strategy — Public Consultation

The Department of the Environment, Climate and Communications has set out a vision of a climate neutral, sustainable, and digitally connected Ireland. This will involve leading ambitious climate and environment action across Government and society together with a fundamental shift in sustainable resource use and a transformation of our energy system while at the same time delivering world-class connectivity and cyber security. The Department has identified research and innovation as important enablers of its goals, and is one of a group of five Government Departments which invest significantly in research and innovation. Impact 2030, the national research and innovation strategy, outlines a strong role for the Department in delivering on Strategic Objectives in Climate, Environment and Sustainability (including Energy), and in Digital Transformation (including cyber security). During 2023, the Department is now developing its inaugural Research and Innovation Strategy.

Please complete this survey by 5:30 pm on Friday 11th August.

Note 1: There are no mandatory consultation questions. Fields can be left blank if you do not wish to answer a particular question.

Note 2: Responses to each of the consultation questions is limited to 2000 characters.

Note 3: Copying and pasting text into the boxes directly from Microsoft Word may cause user experience issues. To avoid this, it is recommended to 'paste as plain text'.

Note 4: You can download a PDF copy of your completed survey after you have submitted it.

* Please enter your name

Text of 5 to 200 characters will be accepted

[redacted]

* Please enter your email address

[redacted]

* Please enter your occupation

[redacted]

If you are responding on behalf of an organisation, please enter the name of that organisation.

200 character(s) maximum

University College Cork (UCC)

Job Title (if applicable)

[redacted]

What gaps do you see in the Department's current research and innovation activities? How should we address those gaps in the Department Research and Innovation Strategy?

2000 character(s) maximum

Recent analysis by UCC has identified the following key research gaps that we feel should be prioritized in order for Ireland to effectively translate its climate ambitions into climate action:

1. Improving subnational analysis of GHG emissions and removals Research is needed to improve sub-national estimates of energy use and associated emissions as well as for emissions and removals from agriculture and land uses, and other emissions, potentially through the development of a distributed analysis system, dashboard or repository for sharing information. This should be linked with and support the official analysis provided by the National Inventory system.
2. Energy efficiency and demand-side management. Further research is required to understand the barriers and drivers of energy efficiency and demand-side management in Ireland. This would help in understanding the enablers required for policymakers and stakeholders to develop targeted strategies to promote sustainable energy practices.
3. Foresight into future technologies. More analysis is required to inform Future Energy Choices beyond 2030 relating to the scale and magnitude of technologies that will help get us to net zero emissions.
4. Quantifying Carbon dioxide removals to bridge evidence gap. There is a need to quantify the extent of carbon dioxide removals required to provide a clear pathway for climate neutrality which should take account to the climate impacts of emissions as well as risks associated with the permeance of removal solutions particularly nature based solutions.
5. Balancing agricultural emissions via management of terrestrial sinks. Despite the recognition of the importance of agricultural emissions and land-use removals, there is a critical research gap in determining the specific levels of emissions that can feasibly be balanced with land-use practice.

Continued in the next section/...

What actions can the Department take to identify future trends in the areas under our remit?

2000 character(s) maximum

Continuing from previous section/...

6. Expanding use of observational data. Continued enhancement and development of the national inventory within the LULUCF sector is very important. This can be enabled by increasing use of observational data from soil flux towers and atmospheric sites, as well as the use of remote sensing and enhance activity data derived from such observations.
7. Integrated assessments. Addressing the knowledge gaps including an integrated assessment of whole of economy transitions and transformation options. These would include agriculture, energy and land-use is .
8. Mobilizing Climate action. Research is needed to identify effective strategies and interventions to effectively engage with citizens and communities, build societal capacity, and mobilize society wide climate action.
9. Integrating Mitigation and Adaptation. There is a critical need for research to uncover the synergistic co-benefits that can be derived from implementing integrated mitigation and adaptation measures.
10. New economic paradigms implications of transition to low carbon future. Addressing the research gap in Ireland regarding the economic implications of energy and livestock reductions is essential, this will provide policymakers and stakeholders with insights necessary for evidence-based decision-making and the development of targeted policies.

In addition:
A. Research calls in the environmental arena can be rather siloed. There is a need to undertake more research that explores multiple sustainability objectives and synergies, particularly research that cuts across climate action, circular economy and biodiversity protection.
B. There is a lack of capacity for foresight analysis and futures thinking across all environmental areas. Investment in foresight would mean that research can be proactive and ahead of future environmental challenges rather than reactive.

Are there specific thematic areas relevant to the Department's remit which you would like to see more research and innovation activity in? How can this be achieved?

2000 character(s) maximum

See above.

Have you views on the impact of disruptive technologies such as AI, Quantum and 6G as part of the digital transformation agenda and the implications of these technologies for the Department?

2000 character(s) maximum

1. There is a particular opportunity with Artificial Intelligence and Machine Learning in the consolidation of siloed national data sets combined with earth observation data to support decision-making in environmental policy, energy management, and digital infrastructure planning. AI and ML can process vast datasets rapidly, providing key insights for environmental conservation, energy optimization, and policy decisions. They can greatly enhance energy storage and transmission systems by optimizing grid operations and predicting energy demand. Advanced analytics can process large volumes of data from various sources to provide valuable insights.

2. Research & Innovation test beds are needed to develop and trial disruptive technologies including power conversion, energy storage, transmission, and integration to significantly improve the efficiency and resilience of our national grid and ensure optimal integration of renewables. In addition, experiential training programmes are needed to continuously upskill the Irish energy sector in these disruptive technology fields.

3. Digital twins (virtual replicas of physical systems) in combination with AI and analytics, through simulation and analysis of complex systems such as the national grid can optimize energy management, predict system failures, and plan infrastructure upgrades, leading to more resilient energy networks.

4. Development and deployment of future wireless technologies such as 6G to enable faster, more reliable data transmission which is key for real-time environmental and energy systems monitoring and for enhanced digital inclusivity, requires significant research funding and infrastructure investment as well as updated regulatory frameworks.

5. Where disruptive technologies can be integrated that is where the greatest impact will be. Very often we see development of AI for example with a tag-on application. What is needed is using AI as an enabler to help address research questions.

How can the Department better communicate its research and innovation needs?

2000 character(s) maximum

1. Identification of key stakeholders and communities of interest and characterize and analysis of the debates and discourses taking place in each of these groups. Once it has been identified how these groups conceive of and approach the challenges of climate change and biodiversity loss, these insights can be employed to create targeted engagement strategies.

2. It is evident that a significant communications campaign - aimed at informing the public of the changes necessary for a just transition to a zero-carbon society, and recruiting public support for such measures - will have to be undertaken by the Department. There is an extensive body of research in the field of climate and environmental communications which finds that a range of messages, framings, platforms, and channels must be mobilized to reach and engage fragmented audiences. The Department should consider a programme of establishing research aimed at identifying how different sectors, groups, and communities, such as farmers, coastal communities, the corporate sector, the transport sector, construct climate change in their separate discourses.

How can the Department work more effectively to source evidence from the national research and innovation community to support its work in policy development, policy implementation, and the uptake of new technologies?

2000 character(s) maximum

1. Active ongoing relationship-building and collaboration with HEIs, RPOs and with industry and community partners. The latter are particularly important in supporting the update of new technologies and behaviour change in relation to climate change, for example. This engagement process would need to be supported by capacity-building for all stakeholders to ensure it is effective and mutually beneficial.

2. Consideration could be given to introducing a structure within the Department for engaging with external experts.

3. Agencies like the EPA have an effective science to policy interface and their effort to track research outputs is a model that should be replicated to identify potential innovation.

How can the Department engage more effectively with all stakeholders in the national research and innovation system? If you are responding on behalf of an organisation, please state how the Department could more effectively engage with your organisation.

2000 character(s) maximum

1. For many sustainability challenges additional scientific knowledge about the underlying problem is not necessarily the limiting factor in the development of more sustainable outcomes.

2. Instead, a combination of social values, political and institutional contexts, and technological diffusion often impede effective action. While scientific knowledge may be required, an equally important task is to link the production of this knowledge with actions where it matters.

3. Research co-production and engaged research can be as an appropriate means to meet the requirements posed by real-world problems. These approaches bring actors from outside academia into the research process in order to integrate the best available knowledge, reconcile values and preferences as well as creating ownership of solution options.

Research co-production and engaged research could be better supported through more flexibility in how and to whom research funding is allocated.

Should the Department seek to grow its capacity to carry out in-house research? If yes, how can this be achieved?

2000 character(s) maximum

1. There is potential for the Department to play an important role in creating a two-way, reciprocal process of capacity building. For example, departmental officials could be seconded to work with university-based researchers on specific research projects. Likewise, university researchers could work in the department, in collaboration with the department's in-house research team. This sharing of expertise, methodological approaches, and research cultures could be of benefit to both parties.

Ireland also needs:

a. Demonstrator sites for research where the research pipeline can be facilitated from fundamental science to demonstration. For example: modular wastewater treatment infrastructure where new technologies can be tested for chemicals removal, solids removal; sludge characterisation and application.

b. Renewables test facilities.

c. Funding for scaling-up of research outputs to demonstrator – for example development of multiple units for test in different scenarios.

d. This demonstrator/test requires engineering capability; therefore, support for engineering research programmes is needed to retain engineers in research.

e. Support for hackathons to look at solving problems through research.

Are there examples internationally of Government strategies on research and innovation in climate, communications / digital, circular economy, cyber security, energy or environment that we should examine? If so, can you provide details?

2000 character(s) maximum

1. Denmark's Climate Act provides a robust roadmap for reducing greenhouse gas emissions significantly by 2030 and achieving climate neutrality by 2050, aligning with the department's climate goals.

2. New Zealand's Zero Carbon Act also places a strong emphasis on the role of research in climate change mitigation and adaptation.

3. The Netherlands' Government-wide Programme for a Circular Economy sets a leading example in aiming for a fully circular economy by 2050. This involves significant investment in research areas such as resource efficiency and sustainable product design, central to promoting a circular economy.

4. Regarding environmental conservation, the UK Government's 25 Year Environment Plan and New Zealand's Environment Aotearoa strategy both emphasise research and monitoring for the protection and enhancement of natural habitats. These could contribute to the sustainable management and development of inland fisheries and geological resources. The integrated approach of these countries underlines the significance of research and innovation in meeting environmental and conservation objectives.

Are there any other matters you wish to raise in relation to the development of the research and innovation strategy?

2000 character(s) maximum

Government should utilize an across departmental approach to strengthen business R&D investment through increased investment in mechanisms to support HEI-industry partnerships and collaboration in priority areas linked to Ireland's Climate Action Plan.

Contact

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