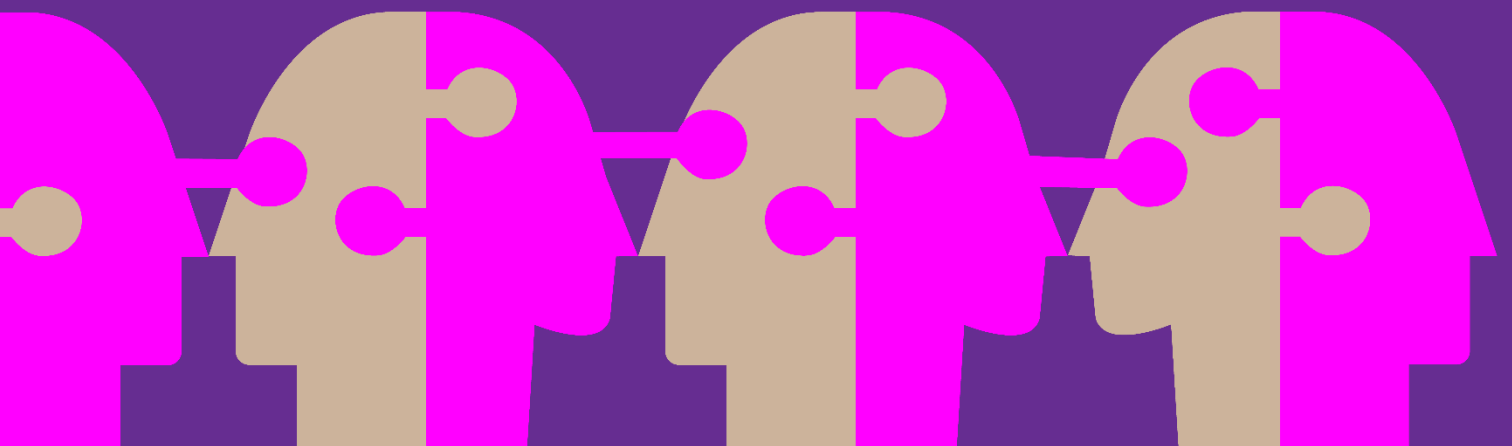


# Research for public policy and society: building a stronger architecture for Ireland

Mary Doyle



DISCUSSION PAPER

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## Abstract

The Royal Irish Academy and the Irish Research Council – building on the close links and shared agenda uniting the two organisations – have come together to jointly host a series of webinars on the topic of Research for Public Policy and Society. These webinars will take place in January-February 2021 and are designed to support and enrich the dialogue among key stakeholders about future developments. This paper has been prepared as a contribution to the discussion by Ms Mary Doyle, a former senior civil servant in the Departments of the Taoiseach, Health and Children, and Education and Skills and currently Visiting Research Fellow in Public Policy at the Trinity Long Room Hub.

The core theme of the paper is the importance of developing a framework of actions to support more aligned activity in the national research ecosystem. Specifically, it suggests that in order to make progress on this agenda action needs to be initiated, led, and managed in three distinct but overlapping spaces: in the research community itself and particularly in the higher education institutions; in our institutions of democracy, specifically the Oireachtas and Government departments; and in the combined efforts of the research funders. Then all three must design an architecture which enables them to engage positively with each other into the future. Finally, the paper suggests some practical steps in building the architecture for dialogue between the various stakeholders, drawing on both national and international experience and practice.

## Executive summary

As the Covid-19 pandemic has demonstrated, the need for reliable research, evidence and thinking that can inform public debate and policy has never been greater. Covid-19 is just one area of complex national policy which needs input from a range of disciplines and a wide range of perspectives. There are many others.

### **Underpinning principles for building a stronger science-policy architecture:**

- Ireland's research expertise represents a significant national strategic asset.
- Enhancing the modes of connectivity and dialogue across the research and policy communities will significantly strengthen the quality and depth of the knowledge and insights available to policymakers charged with responding to complex policy challenges.
- Strong and profitable research-policy networks require access to a broad base of expertise.
- The Public Service Reform and Civil Service Renewal frameworks, the higher education System Performance Framework, and the national research and innovation strategy are existing mechanisms through which research-policy engagement can be incentivised.
- A high-functioning, effective research-policy connect requires a strong architecture with a clarity of leadership, roles, objectives, and tools.

### **Developing the architecture for dialogue**

To make progress on this agenda, action needs to be initiated, led, and managed in three distinct but overlapping spaces: in the research community itself and particularly in the higher education institutions; in our institutions of democracy, specifically in the Oireachtas and in Government departments; and in the combined efforts of the research funders. All three actors must design an architecture which enables them to engage positively with each other. Suggested priorities within each are outlined below.

#### *(1) Research community and higher education institutions*

- Put a stronger spotlight on the relationship with policymaking as a core part of the mission of the higher education sector.
- Consider how the emerging Researcher Career Framework can include a specific focus on the policymaking relationships.
- Support academics across their career to engage with the policy making system through induction, coaching and mentoring by senior academics with a track record in this field.
- Consider the design of incentives and rewards for academics in the higher education system as part of the overall approach.
- Design specific training for academics on how to engage with Government.

Systemwide, there is a need for a more integrated approach with the objective of harnessing the collective research power and expertise of the sector to make it easier for policymakers to draw on it to support their deliberations. Perhaps a good starting point would be to think about how

best to design a collective interface for the various policy-facing institutes and centres of expertise which have been built in the Irish higher education system over the years. The Irish Universities Association (IUA), Technological Higher Education Association (THEA), technological universities, and the Royal Irish Academy (RIA) all have an important leadership role to play in this context.

## (2) *Government and the Oireachtas*

- Require all Government departments to identify and include within their published Statements of Strategy a short statement on Areas of Research Interest (ARIs) which would serve to tell the research community in an accessible way the pressing policy questions which are live in the system.
- Allied to this, there needs to be a focused investment in developing policy capacity in the system, particularly building on the work of the Irish Government Economic and Evaluation Services (IGEES) but broadened to include other disciplines. In this context, there is value in considering how to build two-way secondment pathways between policymaking and academia.
- The Oireachtas has developed several successful initiatives to build research-policy relationships, and these learnings can be drawn upon in the development of a whole-of-system approach. It would be very useful to have a dialogue about these various initiatives and to think how, taken together, they would support a more strategic national approach to building the relationships between research and policy.

## (3) *Public research funders*

- The Higher Education Authority (HEA) has an important role to play as it manages the core funding for the higher education system. The System Performance Framework should, on the next review, include specific material and objectives to support the connect between research and policy.
- The design and evaluation of public research funding calls, particularly those from the major public research funders, fundamentally influence the shape and nature of the overall national research effort. Complex societal, scientific, and environmental challenges require research and collaboration across a range of disciplines. Significant thought and cooperation will be necessary to ensure that not only strong discipline competence but also strong interdisciplinarity are supported by national funding mechanisms.
- When defining, designing and evaluating calls, research funders should adopt a collective approach to ensuring that a broad base of research and all research career stages are supported and that the timing of calls is aligned to make the system easier to navigate.

## **The wider landscape**

*Knowledge management:* Ireland urgently needs to adopt a more systematic approach to accessing knowledge – that is, knowing what, where, and to whom policymakers can turn to access the knowledge and expertise required to contribute to policy deliberations on any given issue. The development of an agreed national research classification scheme currently being undertaken in

the Department of Further and Higher Education, Research, Innovation and Science is an important initiative.

*Open research:* A full roll-out and adoption of open research practices across Ireland's research system will greatly increase access to, and visibility of, research publications and data for policymakers, researchers based outside HEIs and the public, thereby maximising the value and impact of publicly funded research. Ireland's National Framework on the Transition to an Open Research Environment (2019) sets out an important roadmap for action, and its implementation is will greatly support greater access to research.

*Knowledge brokers:* A systematic focus on the mechanism through which to forge links, relationships and connection points for the research and the policymaking communities is necessary. In Ireland, the work of Campus Engage and Knowledge Transfer Ireland is highly relevant and could be drawn on to advance this agenda.

*Widening the scope of our understanding of the pathways of knowledge in society:* Society's complex challenges require multiple sources of knowledge and input from the sciences, arts, humanities and social sciences. Multi-disciplinary inputs to policy discussions should be established as the norm.

*A focus on people as the pipeline for the future:* A much more strategic approach is required for the professional formation of researchers and of policymakers, to enable them to maximise their potential within their respective worlds and to engage more systematically and effectively between the two worlds to address pressing challenges together.

*Research impact and research careers:* Significant movement is required by Irish HEIs to evolve current researcher career frameworks and impact assessments to recognise the contributions and value of science policy work within promotional structures.

### **Implementation challenges: the vital role of leadership**

It is important to acknowledge that not only is this a complex agenda, it also sits in a complex landscape with many moving parts. Therefore, the initial first step of starting a conversation on the central importance for Ireland of building and supporting the relationships between the research and policymaking communities is a vital one. This dialogue will require strong and sustained leadership from a number of particularly important players: the Department of Higher and Further Education, Research, Innovation and Science, together with the HEA, IUA, THEA, RIA, the national research funders, and Government departments.

The prize for a small country like Ireland with big ambition is the ability to draw on diverse sources of expertise, mobilise concerted action, and focus on continuing to make the system better so that it can achieve its potential and support Ireland's future wellbeing.

## Section I. Introduction

*'For a national research endeavour to be successful there needs to be an effective dialogue and understanding between research scientists, politicians and the public, so that policies and strategies are in place to bring about research that benefits society, and that society will support ... This requires effective working between these organisations and sectors, and a compact that bonds science and society, which will both deliver excellent science and ensure that it is used for the public good.'*

Sir Paul Nurse, *Ensuring a Successful UK Research Endeavour: A Review of the UK Research Councils*, 2015, p. 8

In a recent webinar organised by the Irish Universities Association (IUA) and the Royal Irish Academy (RIA) on the subject of 'Evidence Informed Policy Making – the Role of Higher Education and Research', Professor Philip Nolan, President of Maynooth University and Chair of the National Public Health Emergency Team (NPHET) Irish Epidemiological Modelling Advisory Group, described a phone call he received from the Chief Medical Officer, Dr Tony Holohan, right at the very start of the Covid-19 pandemic in early 2020. In that phone call, Dr Holohan asked him what was available by way of research and expertise in Ireland to contribute to managing the pandemic. This was on a Sunday morning and by the following Wednesday a diverse team had been assembled, mobilising a wide range of expertise – no mean achievement for a small country with limited resources.

Making a number of observations based on that experience, Professor Nolan stressed the importance of maintaining a broad base of expertise in the country, ensuring that this expertise base is funded and rewarded for the engagement with policy and that people are supported and encouraged to engage in active dialogue with a diverse set of individuals and networks – both nationally and internationally. He noted that expert research capacity had been built by a focused and sustained investment over decades through the national funding structures. Importantly, the absorptive capacity of the public service to deal with complex issues is high since many policymakers are graduates of the higher education sector. Finally, he pointed to the need to mobilise the expertise of the humanities as core contributors to the conversation.

This story represents a powerful and immediate case study which shows what a small country like Ireland with big ambition can do when it draws on its diverse sources of expertise; the value of concerted action; the importance of getting it right for our society; and the need to continue to make the system better so that it can achieve its potential and support Ireland's future wellbeing.

As the Covid-19 pandemic has demonstrated, the need for reliable research, evidence and thinking that can inform public debate and policy has never been greater. Covid-19 is just one area of complex national policy which needs input from multiple disciplines and a wide range of perspectives. There are many others. In this age of social media, with the rapid emergence of

different forms of knowledge production and mass communication, this is an important issue which urgently requires attention.

## Section 2.

### Looking back: milestones in building the Irish research ecosystem

*‘How we respond to the grand challenges that we face will be the major determinant of economic and societal development in the years ahead. Challenge-led innovation is an increasingly important concept. Stimulating solutions-driven collaboration will foster interdisciplinary consortia of enterprises, higher education institutions and public service delivery bodies to address major societal challenges. Interdisciplinary research is key to addressing such challenges, and incorporating the “human factor” is also vital. Societal challenges are typically highly complex, and the engagement of researchers from both Arts, Humanities and Social Sciences, and Science, Technology, Engineering and Maths can often generate more innovative solutions and new ways of approaching and thinking about problems. Targeted initiatives of different scales are required to cultivate and grow quality interdisciplinary research that can deliver optimal impact.’*

*Innovation 2020: Ireland’s Strategy for Research and Development, Science and Technology, 2015, p. 44*

This is a complex topic, and it is useful to recall the original ambition for research investment in Ireland and trace its evolution over recent decades, in order to consider the next steps in its ongoing development.

#### 2.1 Policy evolution

Guiding the early development of building the Irish research ecosystem was a series of important policy documents, which included the Technology Foresight Ireland reports in 1999 and the Strategy for Science, Technology and Innovation published in 2006 by the Department of Enterprise, Trade and Employment when the current Taoiseach, Michael Martin TD, was Minister in that Department. This latter strategy was a landmark document, which devoted an entire chapter to research in the Public Sector. While not referencing policy as such, it stated, ‘Across the sphere of Government there are important areas of civil and sectoral research which have a great potential to contribute to economic and social progress’ (p. 56). Chapter 6 outlined strategies for Agriculture and Food, Health, Environment, Marine, and Energy, within the context of the overall strategy and the national system of innovation.

In the chapter on implementation, great emphasis was placed on the structures for taking a whole of Government approach, and it added that ‘it is important to ensure that our investment in excellent research also has regard to economic and social needs and that these should play a guiding role in where investments are made’ (p. 83). A particular focus was placed on the regional approach, in which all higher education institutions (HEIs), and the technological sector in particular, were supported in their mission to contribute to local and regional development.



Looking at the key national strategies which have guided developments in this area since then – namely, the National Strategy for Higher Education to 2030, the associated Higher Education System Performance Framework, and Innovation 2020 – they all reference the policy connection. However, it is not articulated as a key component in the same way as, for example, the skills pipeline or building the research capacity with the enterprise sector has been – although one could argue that it is of similar importance. This may be changing, however, as the Midterm Review of Innovation 2020 noted that interdisciplinary research (IDR) could be encouraged further to deliver economic and/or societal impact and that coordination between research and innovation performers and policymakers could be explored further. This shift towards IDR and societal challenges is also seen in the evolution of the European framework programmes, with Horizon Europe due to start next month.

What all the strategy documents have in common is a conviction that better alignment and coordination across this complex landscape is key to addressing societal challenges.

## 2.2 Investment in research through the Core Higher Education Grant and the Programme for Research in Third Level Institutions (PRTL)

Underpinning as it does the overall research ecosystem in the higher education sector, it is important to acknowledge at the outset that in calculating the core grant allocation the Higher Education Authority (HEA) has always intended that a proportion of that funding be used to support basic research in HEIs. The scale of the investment in basic research from this source can sometimes be taken for granted, but it is the foundation on which initiatives like the Government Programme for Research in Third Level Institutions (PRTL) build.

The first major step change in the level of investment in research in Ireland can be traced back to the PRTL, which was launched in 1998. PRTL provided integrated financial support for institutional strategies, programmes and infrastructure to ensure that HEIs had the capacity and incentives to formulate and implement research strategies to give them critical mass and world-level capacity in key areas of research. The Programme supported research in Humanities, Science, Technology and Social Sciences. Importantly, it supported research right across the higher education landscape in both the University sector and the then Institute of Technology sector. Substantial philanthropic funding was also provided to support the strategic focus and competitive basis of the Programme. Four cycles of investment were made with the final cycle announced in August 2007. Thus, the period from 2001 to 2009 was one of major research investment, growth and development. However, the onset of the financial crisis in 2008/09 halted the momentum for development which had been built up, and the level of investment has not kept pace – with resultant implications for the level of growth and performance across the system.

## 2.3 Building the national architecture for research

To support this investment, much important research agency architecture has been built over the period, including the establishment of the Irish Research Council (IRC) – formed in 2012 following the merging of the Irish Research Council for the Humanities and Social Sciences (IRCHSS) and the Irish Research Council for Science, Engineering and Technology (IRCSET) – Science Foundation Ireland (SFI), and Knowledge Transfer Ireland (KTI). All these agencies, taken together, have played a vital role in building up the Irish research ecosystem through investments at both institutional and individual researcher level. A strong focus has been on supporting greater collaboration across the system, building on strengths and identifying opportunities. In other sectors, the work of Enterprise Ireland (EI), the Health Research Board (HRB), and Teagasc, among others, are also key contributors to the overall research ecosystem.

Conversely, since the Advisory Council on Science and Technology was wound down some years ago, Ireland has been in the minority globally in not having some sort of advisory research council.

In the higher education sector itself, there was continued growth in both the university sector and in the technological sector, including the development of strong new institutional models such as technological universities. This has resulted in a strong and engaged research system across the higher education sector and with examples of good policy connect, but these are not brought together in a way that makes them easily accessible to policymakers and other communities. The work of, for example, the Geary Institute in UCD, the Department of Government and Politics in UCC, and the All-Island Research Observatory (AIRO) in Maynooth University, as well as the pathfinding at the former Policy Institute in Trinity, illustrates the potential which exists to enrich the dialogue. Equally, the work of the Technological Universities and Institutes of Technology is an essential contribution to the policy landscape both nationally and regionally. These academic institutions have been enhanced and supported by initiatives such as Campus Engage and the National Forum for Teaching and Learning.

On the Government side, the work of the Irish Government Economic and Evaluation Service and the Library and Research Service of the Houses of the Oireachtas, among other innovations such as departmental Statements of Strategy and Research and Data Strategies, are important building blocks in this context also.

The challenge and opportunity now are to achieve better clarity of mission and greater alignment across the research system.<sup>1</sup>

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<sup>1</sup> The recently published [UK Research and Development Roadmap](#) addresses similar challenges.

## Section 3.

### Looking forward

*'The creation of a single department encompassing further and higher education, research, innovation and science has changed the policy landscape. Universities, with their role in transitions from further education, with their development of talented and rounded individuals that contribute to the knowledge economy and an inclusive society, with their strong research base, with their reach into knowledge transfer and innovation, are uniquely placed to shape and benefit strongly from this new integrated approach.'*

*Minister Simon Harris, Keynote speech at the IUA webinar 'The Future of Ireland', 23 October 2020*

#### 3.1 Creating a unified system

Although a very impressive higher education system has been built in Ireland over the past 30 years, it has tended to be discipline, academic, and institution oriented. It has been less focused on developing the sort of connective tissue in the system which would support a structural dialogue both within and between the research and policy communities. This is true of both the scientific advisory community and the Arts, Humanities and Social Sciences (AHSS) disciplines.

In a paper delivered at the Institute for European and International Affairs webinar on 9 July 2020 and entitled 'Covid19 and the Future of Higher Education', the Provost of Trinity College, Dr Patrick Prendergast, set out his analysis of two waves of activity which have advanced the Irish higher education system. He stated that 'The first wave was transformative for education' in Ireland and 'The second wave was transformative for research' and concluded that 'The time has come now for the third wave, which is uniting the two into a singular mission to create the most talented workforce in the world.' He welcomed the establishment of the Department of Further and Higher Education, Research, Innovation and Science as a unifying mechanism to support and develop this agenda and pointed out that a core question now is how to support the Irish research ecosystem to operate to its potential in the light of where we came from and where we want to go as a society and how the Irish research ecosystem can support the realisation of wider national objectives.

A vibrant connect to policy is key to this, so it is useful to look back to see how the relationship between the strategic direction and accompanying investments into higher education and the world of policy was articulated and whether it has changed over time. Somewhat surprisingly, the conclusion must be that this connect has neither been explicitly recognised nor articulated over a lengthy period. On the practical side, there are very few, if any, organised intermediate structures where expertise (particularly in the Arts and Humanities) has any systematic interaction with other disciplines in developing policy advice. Within the third level sector there are very few places where scholars develop *systematic* interactions with policy as an integral part of their personal and professional development or where subject specific research is combined with knowledge-intensive interdisciplinary cooperation.

The recent establishment of the Department, led by Minister Simon Harris TD, which brings together previously separate elements of the research ecosystem in Ireland, does indeed represent an important opportunity for greater alignment and investment focus in this sector. It provides the platform to build that ‘third wave’ which Dr Prendergast referenced.

This paper will return to develop these themes in Sections 4 and 5, but a useful step now is to look outside the Irish context and identify international models of best practice for connecting policy and research.

### 3.2 Selected examples of international best practice

In scanning the international literature, the following issues emerge.

First, it is clear that many countries consider their research ecosystem as an important national resource for society and have invested in building up that infrastructure and developing connections to policymaking. In this context, it is important to consider how ‘science’ is defined. In the EU context, a broad definition has been adopted, covering a wide range of disciplines which are then further defined as human sciences, social sciences, life, physical, health, computer sciences, etc. However, this is not a universally adopted approach and often a more narrow and focused definition of ‘science’ is used – with significant implications for how the national policy interaction is organised. In an Irish context, taking a broad view of ‘science’ seems to be a very appropriate approach, particularly as a diverse range of perspectives are key to tackling complex societal issues.

Second, there is growing global interest in developing and supporting the architecture of the research ecosystem with the establishment of dedicated structures and systems to deepen relationships between research and public policy.<sup>2</sup> For example, the Policy Impact Unit at University College London (UCL) provides professional policy engagement expertise and support to help feed research-based evidence into the UK policymaking process. The Cambridge Centre for Science and Policy is pioneering new ways of bringing academia and government together. In an EU context, the Scientific Advice Mechanism brings together Commission policymakers, a group of Chief Scientific Advisors and academic experts through Science Advice for Policy by European Academies (SAPEA), which has given a particular emphasis to the connect between science and policymaking at European level. The recent SAPEA publication [Making Sense of Science for Policy under Conditions of Complexity and Uncertainty](#) contains many useful insights and approaches which have a more general application.

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<sup>2</sup> There are quite a few examples of science policy institutions whose mandate includes a clearly articulated responsibility to engage with the policymaking community. For example, the Institute for Science, Society and Policy is a cross-faculty Institute at the University of Ottawa exploring the links between science, society and policy (<https://issp.uottawa.ca/>). The Rathenau Instituut in the Netherlands supports the formation of public and political opinion of socially relevant aspects of science and technology (<https://www.rathenau.nl/en>). There are far fewer examples of dedicated structures in the Arts, Humanities and Social Sciences, but there are some, including SKAPE, the Centre for Science, Knowledge and Policy at the University of Edinburgh (<http://www.skape.ed.ac.uk/>).

Finally, there is an important agenda emerging in relation to interdisciplinary and transdisciplinary research (IDR and TDR), which requires a particular focus and attention, and investment.<sup>3</sup> A recent paper from the OECD, [Addressing Societal Challenges Using Transdisciplinary Research](#), makes an important contribution to this debate. The OECD notes that there are a number of societal challenges, often involving complex human-environment systems, that are not fully understood and for which solutions are urgently required. The impacts of global warming, biodiversity loss, natural disasters, economic migration and health pandemics require both technological and social innovations. OECD concludes that ‘In order to achieve this, different scientific disciplines, including natural and social sciences and humanities (SSH) need to work together and to fully engage other public and private sector actors, including policy-makers.’ In its view solutions cannot to be generated based solely on disciplinary research but require a paradigm shift in research practice.

## Section 4.

### Building blocks for connecting policy and research in Ireland

Having identified these global trends, let us now turn to the question of what can be done in a structured and joined up way to move the agenda forward in the Irish context. Specifically, there is a need to identify those topics and actions which can support the necessary conversations and leverage change. The paper will now focus on the connect between academic research and policymaking and identify key levers for action in both the short and longer term. These are set out in the following paragraphs, together with some practical steps which would move the agenda forward.

#### 4.1 Knowledge management and knowledge brokering

##### 4.1.1 Knowledge management

One of the issues which has become clear in the Irish context is that there is a need for a more systematic approach to knowing what the activity in the research ecosystem is – in other words, we don’t know what we don’t know. Currently, it is difficult to get a line of sight on the research activity in the system – between different institutions, different disciplines, and different projects and programmes. It is not possible for Irish policymakers or indeed any other interested parties to discover what research is being undertaken in Ireland and where and how it is being undertaken. The potential for evidence-based policymaking and for the societal impact of Irish research is severely constrained when basic information about the existence of the research is not accessible.

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<sup>3</sup> The US National Academies have defined interdisciplinary research as ‘a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice’ (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, [Facilitating Interdisciplinary Research](#), 2005, p. 2). Transdisciplinary research, which involves the integration of knowledge from different disciplines and (non-academic) stakeholder communities, is required to help address complex societal challenges.

Addressing this question is fundamental to moving forward on this agenda and is ultimately a core issue in relation to considering the societal impact of Irish research. This issue was indeed identified and addressed in the past with the implementation of the Current Research Information Systems (CRIS) across HEIs to deliver institutionally validated information about their research: people, projects, research outputs, funders. The result at that time (2001-2009) was a searchable, publicly accessible research database that acted as national research showcase as well as an interface between researchers, enterprise and other stakeholders. However, due to the economic downturn, this national initiative was put on hold. The result is that information on the research effort is fragmented and much of what is being achieved is relatively unknown, particularly from the public perspective. A necessary step in this is the development of an agreed national research classification scheme. This was started under *Innovation 2020*, and an SFI Public Service Fellow is currently working in the Department of Further and Higher Education, Science, Research and Innovation on a project entitled Development of a Standardised Classification Scheme for Public Investment in Research.

#### 4.1.2 Open research

The global move towards what is variously called ‘open science’, ‘open scholarship’, and ‘open research’ has as one of its main drivers the aim of making science for policy more accessible and more useful in that a wider range of research outputs (datasets, protocols, software, etc., as well as traditional summary papers) can feed into the policy formation process. It is very important that such outputs should be FAIR, that is, Findable, Accessible, Interoperable and Reusable. It is of little use if research outputs are hidden and not discoverable by search engines and users; or, if discoverable, are inaccessible behind financial and institutional barriers; or encoded in non-standard formats, which makes it impossible to integrate them with other products; or described by limited metadata, which makes it hard to reuse them. So the aim of open research is two-fold: first to move publication upstream in the research process so that data, software tools, protocols, etc. are made publicly available and not only the final derived analyses; and second to use modern information technology to facilitate easy, inexpensive, and efficient access to these research outputs, for example through the use of sophisticated data mining techniques. Both these aspects clearly have the potential to significantly improve the usability of research for policy formation.

Ireland has a National Open Research Forum (NORF), which is charged with the development of a national strategy for open research. This function is due to move to the new Department of Higher and Further Education, Research, Innovation and Science in the near future. Ireland’s National Framework on the Transition to an Open Research Environment, developed by NORF and launched in July 2019, sets out the aims and intent of the research community across five key areas of open research: open access to research publications; enabling FAIR research data; infrastructures for access to and preservation of research; skills and competencies; and incentives and rewards. NORF is currently developing a National Action Plan which will define nationally coordinated actions required to implement the national framework and improve the uptake of open research practices. To date, while quite a bit of policy work has been done, implementation is lagging and will require significant investment. Data storage in particular will require investment

in infrastructure and dedicated staff to curate and manage it in accordance with best practices for data stewardship and digital preservation. There is also more work to do to enhance active researchers' understanding of the importance of open research practices. A significant factor here is that all future EU-supported research projects will have to have data management plans submitted as part of the proposal and will be required to conform to open science principles.

Fully embedding open research practices would greatly increase access to research publications and data for policymakers, researchers based outside HEIs, and the public and thus maximise the value and impact of publicly funded research. Supporting the free availability and exchange of high quality research information by implementing the NORF strategy will allow policymakers ready access to the latest research relevant to their areas of responsibility; speed up certain aspects of the research process, allowing faster implementation of findings; and also contribute to a more egalitarian knowledge society, where research data and informed analysis are freely available to those outside HEIs.

#### 4.1.3 Knowledge brokering

Another important aspect of this issue is the question of knowledge brokering. It is one thing to know what and where research is being undertaken. It is quite another to be able to forge links and relationships to join the research and the policy making worlds. A systematic focus on building the architecture to do this is vital. In Ireland, Campus Engage has been an important resource in this arena, having published a very helpful series of policy briefings for civil servants and policymakers, HEIs, and funding agencies on Engaged Research for Impact. Also, the success of KTI in driving economic impact of research may be a useful pathfinder. KTI adopted a systematic and strategic approach and, critically, had national support from the top. People were placed on the ground in the HEI Technology Transfer Offices (TTOs) to broker connections between the research community and the enterprise base, and they entered into contracts with the HEIs for delivery of targets. There could be lessons from this initiative perhaps in relation to the policy arena.

There are other useful innovations which could be helpful in the Irish context. By way of example, there are a number of important initiatives underway in the UK. Most recently, UCL has been awarded almost £4m by Research England to explore ways of improving academic-policy engagement, in partnership with the universities of Cambridge, Manchester, Nottingham and Northumbria, as well as Parliament, Government and policy organisations. The project, called CAPE: Capabilities in Academic-Policy Engagement, will 'pilot a range of interventions to improve the quality of academic input into public policy, enabling universities to respond to emerging and pressing questions in an agile, targeted way. By working in partnership, it is hoped that both researchers and policy professionals will be able to connect experts in their field more quickly, and co-develop effective interventions based on reliable evidence. The project will develop a range of evidence-based tools and resources to support academic-policy engagement and establish a virtual



Centre for Universities and Public Policy to provide a collaborative platform for networking and sharing knowledge.<sup>4</sup>

There certainly seems to be potential in the Irish context to consider how best to design a collective interface on the lines of the above, starting perhaps with those policy-facing parts of the Irish HEI landscape, such as those mentioned in Section 2.3.

## 4.2 Widening our understanding of the pathways of knowledge in society: the contribution of the Arts and Humanities and of Interdisciplinary and Transdisciplinary Research

As stated in Section 3.2, IDR and TDR have been identified as important factors by the global research community. Likewise, the contribution that AHSS disciplines make is also coming firmly into focus at this time, particularly in the light of the Covid-19 challenges which will continue to profoundly change how we live. A recent blog on the Irish Humanities Alliance website by Professor Daniel Carey, Director of the Moore Institute for Research in the Humanities and Social Studies at NUI Galway, titled '[The Humanities and Covid-19 Research](#)', makes a compelling case and sets out a rich tapestry of possibilities for contributions from across the AHSS landscape. In Denmark, a research programme is in train in the Humanomics Research Centre at Aalborg University Copenhagen with the aim of widening the current scope of understanding of the pathways of humanistic knowledge and how deeply they are integrated in the functioning of societies.

Likewise, the Horizon 2020 funded SHAPE-ID project, led by Professor Jane Ohlmeyer (TCD), designed to positively influence the shaping of IDR and TDR practices in Europe with a particular focus on the Arts and Humanities. A key element of the project has been to rigorously consider the factors which support or hinder IDR and TDR. The final results of this project, when available, will help to inform further action in this area.

Another relevant contribution to this discussion is contained in the British Academy's 2016 publication [Crossing Paths: Interdisciplinary Institutions, Careers, Education and Applications](#), which focuses on the mechanisms for advancing IDR and TDR across the higher education sector. It considers this important as most of the major challenges facing society require IDR and cooperation.

Clearly, integrating the AHSS community and IDR/TDR perspectives as important resources into the research and policy conversation at an early point, and keeping them there, is crucial to making progress in better addressing our societal challenges. The challenge now is to think about how to go about designing and putting into action the practical steps needed to develop and deepen this interaction. A good starting point is in the arrangements for the design, award and evaluation of research funding.

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<sup>4</sup> [£3.9m awarded to national collaboration to support academic engagement with public policy](#) (CAPE launch announcement), 15 June 2020.



### 4.3 The importance of thinking about policy relevance in the mechanisms of research funding

How we design the programmes, calls and evaluations from the various funding streams at the national level plays a central role in deciding on what research gets prioritised and funded. It is worth giving some specific consideration to the issues that arise in this context.

There are a number of streams of funding into the research ecosystem, but they can be broadly categorised as institution-specific funding, national research funding (IRC, SFI, HRB, EI, etc. in the Irish context), European Union funding, and philanthropic funding. From the outside looking in, there appears to be a multiplicity of funding programmes aimed at different disciplines and different times of the research career lifecycle. In a small country, it should be possible to think about a much better alignment of the funding on a strategic basis to support researchers at all stages of their careers, to support a broad base of research in the country, to better align the programmes (and perhaps simplify them), to align the timing of calls and all round to make the system easier to understand and navigate. Again, this is an area where the new Department could take an important initiative.

Equally, thought could usefully be given to the need for new research management approaches, including innovative peer review and evaluation processes. It is essential to think through in advance the details of how programmes and calls are designed in terms of their aims and objectives, the core elements to be included, and the evaluation process to be used. Making room in a structured way to include a variety of voices in these conversations early in the design stage requires a major shift in thinking in a discipline-driven system.<sup>5</sup> This is another important part of the overall process of change.

### 4.4 A focus on People – the pipeline for the future

In the wider debate on these issues, it is clear that what is now required is a focus on people. There is much to be said on this subject, but clearly nothing will happen to advance this important work without a much more strategic focus on the people within the research and policymaking systems and how they interact, both in their own worlds and when the two worlds connect. In the academic sphere, there is a need to include reference to both established researchers and early career researchers as they have different roles and realities to address. Action is required at both national and institutional levels. Some starting points to guide action are set out below:

- Put a stronger spotlight on the relationship with policymaking as a core part of the mission of the higher education sector.
- Consider how the emerging Researcher Career Framework can include a specific focus on the policymaking relationships.

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<sup>5</sup> A recent SHAPE-ID webinar on '[Funding Interdisciplinary Research with the Arts, Humanities & Social Sciences](#)' provides a useful discussion of these issues.

- Support academics across their career to engage with the policy making system through induction, coaching and mentoring.
- Consider the design of incentives and rewards for academics in the higher education system as part of the overall approach.
- Design specific training for academics on how to engage with Government.
- Consider how to enable people to move between research and policy work during their careers. For example, existing arrangements such as the Public Appointments Service graduate recruitment process and the civil service secondment policy could be further developed to support the policy-research interaction.
- Consider how best to leverage EU programmes on an integrated basis to support the development of the academic-policymaking infrastructure. This is an opportune moment to do so, as Horizon Europe funding arrangements are put in place.

## 4.5 Research impact

‘Research impact’ means different things to different people, but all agree on the underlying principle that excellent research should benefit society – whether by advancing scientific knowledge, cultural understanding, the economy, health and wellbeing, the enhancement of civil society, environmental stewardship, or developing innovative solutions to other pressing challenges. How to harness research for maximum benefit is an important issue for policy and society.

The HEA is currently funding an Impact Toolkit project which is being led by UCD and based jointly on the UKRI, SFI, and European Science Foundation’s definitions of many types of impact, including academic impact.<sup>6</sup> The University of Limerick has similarly developed a series of Impact Case Studies and tools to encourage UL researchers to plan their projects with a range of pre-defined benefits in mind.<sup>7</sup> Relevant to these developments in Ireland was the UK’s inaugural Research Excellence Framework (REF) in 2014, which defined impact as ‘an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, *beyond academia*’ (italics added). In New Zealand, a 2019 position paper on The Impact of Research proposes moving the agenda forward with the same purpose, defining research impact as ‘a change to the economy, society or environment, *beyond contribution to knowledge and skills in research organisations*’ (italics added). By contrast, in 2018 the then President of the European Research Council (ERC), Professor Jean-Pierre Bourguignon, defined research impact as ground-breaking contributions to knowledge within and across the disciplines, which may or may not be subsequently exploited in unpredictable ways, and warned against being overly

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<sup>6</sup> See UCD Research and Innovation, ‘Impact – Plan, Capture, Communicate’, <https://www.ucd.ie/research/portal/outcomesandimpacts/impactplancapturecommunicate/> and ‘Types of Impact’, <https://www.ucd.ie/research/portal/typesofimpact/>.

<sup>7</sup> University of Limerick, ‘Research Impact’, <https://www.ul.ie/research/research-impact>.

prescriptive.<sup>8</sup> These varying perspectives illustrate the complexity of the issues involved, which need further discussion and resolution.

Relevant to the connection between research and policy, the impact agenda has positively been associated with the engagement agenda. Indeed, in the UK, there are calls for an alternative approach that focuses on engagement rather than impact.<sup>9</sup> In Australia, a national assessment of the engagement and impact of university research effort has been underway since 2015, and an Engagement and Impact Assessment pilot was conducted in 2018 as a companion exercise to Excellence in Research for Australia (ERA). From the universities' perspective, it is worth noting Research Impact Canada (RIC), a pan-Canadian network of universities committed to maximising the impact of academic research for the public good in local and global communities. In Ireland, Campus Engage (based within the IUA) has led the way in developing strategy and producing resources to support Irish HEIs to embed, scale, and promote civic and community engagement. They define 'Engaged Research and Innovation for Societal Impact' as 'research that aims to improve, understand or investigate an issue of public interest or concern, advanced *with* community partners rather than *for* them.' Useful publications include the Framework for Engaged Research and Planning for Impact guidelines.

This is an opportune moment to have a full, nationally coordinated discussion on what research impact is, how it is conceptualised, who drives it, and whether or not a 'one size fits all' for all disciplines is the most useful approach. This is a very important national discussion as it directly impacts on investment decisions. It is particularly timely for dialogue to take place between the higher education system and the Government in advance of Ireland's next strategy for research and development.

## Section 5.

### Next steps: developing the architecture for dialogue

What to do with this complex agenda in a complex landscape? It is clear that making progress requires concerted action on the part of a number of actors – specifically, academics, policymakers and funders. As these worlds intersect, each group needs to better understand the world of the other.

The starting point is that there is still little structural dialogue between the academic community and policymakers. To make progress on this agenda, action needs to be initiated, led and managed in three distinct but overlapping spaces: in the research community itself and particularly in the HEIs; in our institutions of democracy, specifically the Oireachtas and Government departments; and in the combined efforts of the research funders. Then all three must design an architecture which enables them to engage positively with each other into the future.

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<sup>8</sup> Speech to Coimbra Group of Universities Meeting, Venice, Italy, 6 December 2018, 'How to Define Research Impact'.

<sup>9</sup> Kat Smith et al., 'The UK Needs a New Impact Agenda', Transforming Society blog, 6 May 2020.

## 5.1 Research community

There are important actions to be taken at the HEI level in order to support these relationships, which have implications for the professional formation of academics. A clear articulation of the importance of the policy connect is an essential starting point, and creating a specific space within the emerging Researcher Career Framework would be extremely helpful. Combining this with support on an ongoing basis through induction, coaching and mentoring supports offered to academics would help to deepen and develop the relevant skills for engaging with Government.<sup>10</sup> A menu of actions and supports is set out at Section 4.4 above, which could act as a useful resource for institutional consideration of this issue.

There is a need for a more integrated approach in the Irish system. More connective tissue is required. The IUA and the Technological Higher Education Association (THEA) have an important leadership role to play in ensuring that Irish research achieves its full impact. The work of KTI in relation to the economic aspects of research impact demonstrates that an intentional approach yields measurable results. This level of intentionality should be extended to all types of research impact and all relevant policy areas. Further afield, we see the establishment of the Universities Policy Engagement Network (UPEN) in the UK to harness the collective research power and expertise of the 60 member universities and to make it easier for policymakers to draw on it to improve policy. The Alliance for Useful Evidence, hosted by Nesta with additional support from the UKRI Economic and Social Research Council (ESRC) and National Lottery Community Fund, champions the smarter use of evidence in social policy and practice. At individual university level, Policy@Manchester and the Institute for Policy Research at the University of Bath are good examples of an architecture to enable effective research collaborations right across their respective academic communities to contribute to tackling public policy challenges in the UK and beyond.

As interconnected networks of outstanding and independent scientists, Academies are particularly well placed to engage in horizon scanning activities, picking up from the cutting-edge science activities conducted by members those issues which are likely to be of relevance to society and therefore to policymakers. The all-island nature of the Royal Irish Academy places it in a particularly valuable leadership position in this regard on the island of Ireland. At a European level, the European Academies Science Advisory Council (EASAC) released a guide to Good Practice in the Dialogue between Science Academies and Policy Communities in 2012.

## 5.2 Government departments and the Oireachtas

The second pillar focuses on the institutions of government – in this context, the Oireachtas and Government departments. Many Irish Government departments have published data and research

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<sup>10</sup> The UKRI Arts and Humanities Research Council's 'Engaging with Government' training course is an interesting model of a focused approach. This course aims to encourage academics to see opportunities where their research could make a valuable contribution in a public policy context; challenge researchers to think in more depth about the policy process and the role of research within it; and increase the influencing and communication skills needed to achieve this. They have also published How to Engage with Policy Makers: A Guide for Academics in the Arts and Humanities.

strategies, so it would be relatively easy to augment these on the lines of the UK model whereby Government departments publish short Areas of Research Interest (ARIs) that inform the research community in an accessible way about which pressing policy questions are live in the system. A helpful example is the Data and Research Strategy published by the Department of Justice.

Allied to this, there needs to be a focused investment in developing policy capacity in the system, particularly building on the work of the Irish Government Economic and Evaluation Service but broadened to include other disciplines. In this context, there is value in considering how a secondment of policymakers into academia could work. This is because an equally important element of relationship building is to allow policymakers an opportunity to step outside of their daily role through secondment to an academic institution to undertake a specific piece of policy analysis informed by their professional expertise. No funding stream exists to support this, so this could be part of the overall strategic framework to be developed.

In the broader parliamentary arena, the work of the Oireachtas Library and Research Service is also an important piece of the architecture with significant potential to contribute to building relationships between policymakers and active researchers.

There is in fact quite a lot of activity connecting the research system to the work of the Oireachtas. The IRC runs an Oireachtas shadowing scheme in which funded researchers at any career stage may shadow for one or two days a TD or Senator with responsibilities in an area related to their research. It has been working well and certainly raises awareness at both ends. The SFI Public Service Fellowship is a pilot initiative which offers researchers an opportunity to be temporarily seconded to Government departments, agencies and the Library and Research Service of the Oireachtas, to work on specific projects where they can add value, resulting in mutually beneficial outcomes. As part of its mission to inform public policy and to strengthen the link between research and policy, the Royal Irish Academy supports parliamentary pairings between Members of the Academy and elected politicians in the Oireachtas and in the Northern Ireland Assembly. The previous scheme with the NI Assembly involved Members of the Legislative Assembly being paired with scientists and researchers working on issues of relevance in their constituency or committee work, such as fracking, flooding and mining.

It would be very useful to have a dialogue about these various initiatives and to think how, taken together, they would support a more strategic national approach to building long-term relationships between research and policy.

In another useful model, the ESRC and the Government Office for Science in the UK have jointly funded two Areas of Research Interest (ARI) Fellowships designed 'to enable genuine co-creation (of projects, analysis and programmes of work) between researchers and those making and informing policy.'

### 5.3 Research funders

Finally, we should consider the role of funders. The HEA has an important role to play here as it manages the core funding for the higher education system based on the System Performance Framework, which Government has approved as setting out key objectives for the system. The System Performance Framework could, on the next review, include specific material and objectives to support the connect between research and policy in a more direct way. Another important benefit in this approach would be the ability to bring the support for research through the HEA core grant into sharper focus as the crucial role which it plays in supporting the overall research ecosystem is not always as visible as it might be.

In relation to funding councils, how programmes and calls are defined, designed and evaluated fundamentally influences the shape and nature of the overall national research effort. Moving away from a primarily discipline-led approach, as is being advocated in much of the literature in order to support the inclusion of a wider variety of knowledge and perspectives, will require significant thought and cooperation. Strong discipline competence is an essential prerequisite for strong interdisciplinarity. Both require support mechanisms. Some of the areas which could usefully be considered from a whole of system perspective include:

- The need to ensure that funders and policymakers can engage across the spectrum of disciplines and with IDR/TDR experts when defining, designing and evaluating calls;
- What support and incentives can help HEIs to build capacity overall by investing in all stages of researchers' careers;
- Specifically, in relation to IDR and TDR, how to integrate them into education and training at an early stage and how to de-risk career paths by providing appropriate employment opportunities;
- How funding programmes can allow for additional resources to support IDR/TDR development as a strategic part of overall capacity building in the sector;
- How best to mobilise the data and knowledge of the overall system and to work collectively to better support Irish researchers in their applications for funding, including EU funding.

European funding provides great opportunities for Ireland. Gaining substantial funding, through the European Commission's highly competitive programmes, for world-class research projects based in or led from Irish HEIs enhances the capacity and reputation of the Irish system. It attracts international talent, economic and additional benefits to Ireland, while such projects make valuable contributions to solving European and global challenges and to expanding human knowledge across all disciplines. Accordingly, a range of supports have been developed by Ireland's public research funders, coordinated and led by EI, to maximise the success of Ireland-based applicants in obtaining European funding through successive Framework Programmes, most notably Horizon 2020 (2014-2020), which is soon to be followed by Horizon Europe (2021-2027). Resources to assist Ireland-based applicants include financial supports, ERC proposal support, and a network of National

Contact Points (NCPs) – based in EI, SFI, IRC, IUA, HRB, the Environmental Protection Agency, the Marine Institute, and the Department of Agriculture, Food and the Marine – who provide guidance, practical information and assistance on all aspects of participation in Horizon 2020. Furthermore, the [Irish Marie Skłodowska-Curie Office](#) provides advice and support on preparing applications for funding through the Marie Skłodowska-Curie Actions (MSCA) and the management of MSCA awards, which include individual fellowships and consortium grants and involve the cross-border and cross-sector mobility of researchers. Success in national funding calls can offer a springboard to success at an EU level. Through the course of Horizon 2020, domestic funding agencies have sought to provide strategic opportunities through their funding calls for researchers in Ireland to build capacity, networks, and expertise and thus better position themselves to compete in Horizon 2020. For example, the IRC Laureate Awards are designed to align with ERC Starting, Consolidator, and Advanced Grants; since the programme launched in 2017, Laureate award holders have gone on to win ERC grants worth c. €19 million in total.

The combined results of these strategic efforts and investments are impressive. Ireland set a total national target of €100 million over the seven years of the Horizon 2020 Framework Programme with an aspirational target of €125 million. To date, Ireland has won nearly €140 million in ERC funding under Horizon 2020 – well beyond the indicative ambitious national target.<sup>11</sup> In the post-Brexit world, Ireland has the potential to be even more successful in the European research area.

Finally, there is an important role for philanthropic research funding as an integral part of the Irish system, which also needs to be considered in this context.

## Section 6.

### Implementation challenges: the vital role of leadership

In this final section, I want to say a word about implementation. A former colleague of mine famously coined the acronym IDD – Implementation Deficit Disorder. Her point was to highlight that when a strategy was written or a decision was taken to proceed in a certain way, insufficient attention was paid over the longer term to see that the actions which had been committed to had indeed been taken. This is particularly difficult when the ownership for achieving the various objectives become more and more distributed. That is why putting in place a strong focus on implementation over a sustained period is both so important and so challenging in the policy context.

Ireland's ambition in establishing a high-performing research ecosystem that delivers advice for policy can be scaled up in accordance with our geopolitical position in the world. First, there is a clear domestic agenda for change based on stronger alignment right across the Irish research ecosystem. Second, there are potential benefits to an all-island approach to building relationships, working together to strengthen the overall research base and to identify and address shared policy

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<sup>11</sup> IRC, ['Supporting Ireland's Continued Success into Horizon Europe'](#).

issues. Finally, our goal should be to maximise the impact of Irish research in a wider European and global setting. The need – and, indeed, the opportunity – to do so has become more urgent in the post-Brexit world when valuable UK contributions to formulating policy positions will no longer be available. We need a more robust, integrated, and self-reliant system to accomplish this aim.

Therefore, the initial first step of starting a conversation on the central importance for Ireland of building and supporting the relationships between the research and policymaking communities is a vital one. This dialogue will require strong and sustained leadership from a number of particularly important players: the Department of Higher and Further Education, Research, Innovation and Science, together with the HEA, IUA, THEA, RIA, the national research funders and NCPs, and Government departments. The establishment of the Department of Further and Higher Education, Research and Innovation provides a vital foundation for this strong and sustained leadership.

The prize of a strong national research infrastructure which is well connected to the world of policymaking is an important one for Ireland and one which should be within our grasp if we can begin to reimagine and weave together the important pieces which Ireland has built over a long period into a stronger whole.

Mary Doyle  
December 2020



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## Policy-facing research institutes and initiatives

### Based in Ireland

All-Island Research Observatory (AIRO), Maynooth University: <https://airo.maynoothuniversity.ie/>

Campus Engage: <http://www.campusengage.ie/>

Department of Government and Politics, UCC: <https://www.ucc.ie/en/government-and-politics/>

Geary Institute for Public Policy, UCD: <https://www.ucd.ie/geary/>

IRC Oireachtas Shadowing Scheme: <http://research.ie/2018/07/11/researchers-to-shadow-oireachtas-members-under-new-irish-research-council-initiative/>

Knowledge Transfer Ireland: <https://www.knowledgetransferireland.com/>

RIA MLA Scientist Pairing Scheme:  
<https://www.belfasttelegraph.co.uk/opinion/columnists/archive/press-feed/foster-launches-mlascientist-pairing-scheme-29666183.html>

RIA Oireachtas Science Pairing Scheme: <https://www.ria.ie/oireachtas-science-pairing-scheme>

SFI Public Service Fellowships: <https://www.sfi.ie/funding/funding-calls/public-service-fellowship/>

### Based outside Ireland

Alliance for Useful Evidence: <https://www.alliance4usefulevidence.org/>

CAPE: Capabilities in Academic-Policy Engagement project, involving University College London, University of Cambridge, University of Manchester, University of Nottingham, University of Northumbria, UK Parliamentary Office for Science & Technology, UK Government Office for Science, the Alliance for Useful Evidence, and the Transforming Evidence hub:  
<https://www.cape.ac.uk/>

Centre for Science and Policy, University of Cambridge: <http://www.csap.cam.ac.uk/>

European Academies Science Advisory Council (EASAC): <https://easac.eu/>

Humanomics Research Centre, Aalborg University Copenhagen: <http://mapping-humanities.dk/programme.html>

Institute for Policy Research, University of Bath: <https://www.bath.ac.uk/research-institutes/institute-for-policy-research/>

Institute for Science, Society and Policy, University of Ottawa: <https://issp.uottawa.ca/>

Knowledge Exchange Unit, UK Parliament: <https://www.parliament.uk/get-involved/research-impact-at-the-uk-parliament/knowledge-exchange-at-uk-parliament/>

Policy@Manchester, University of Manchester: <https://www.policy.manchester.ac.uk/>

Policy Impact Unit, University College London: <https://www.ucl.ac.uk/steapp/collaborate/policy-impact-unit-1>

Rathenau Instituut: <https://www.rathenau.nl/en>

Science Advice for Policy by European Academies (SAPEA), part of the European Commission's Scientific Advice Mechanism: <https://www.sapea.info/>

Scientific Advice Mechanism, European Commission: [https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors\\_en](https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors_en)

SKAPE Centre for Science, Knowledge and Policy, University of Edinburgh: <http://www.skape.ed.ac.uk/>

Universities Policy Engagement Network (UPEN): <https://www.upen.ac.uk/>

UK Department for Business, Energy and Industrial Strategy. *UK Research and Development Roadmap*. 1 July 2020. <https://www.gov.uk/government/publications/uk-research-and-development-roadmap/uk-research-and-development-roadmap>

UK Parliamentary Office of Science and Technology (POST): <https://post.parliament.uk/>

UKRI Arts and Humanities Research Council and Institute for Government 'Engaging with Government' training course for academics: <https://www.ukri.org/opportunity/engaging-with-government-2021/>

UKRI Economic and Social Research Council and Government Office for Science Areas of Research Interest (ARI) Fellowships: <https://esrc.ukri.org/files/funding/funding-opportunities/esrc-go-science-areas-of-research-interest-ari-fellowships/>