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Policy Forum for Ireland: Next Steps for Research & Innovation Policy and Funding in Ireland

Assessing the current R&I landscape in Ireland – key priorities moving forward

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Over the latter decades of the twentieth century, the big story in Ireland was massification – widening access and participation. Quite simply, getting more people well-educated. Today, the focus has shifted outwards looking at Ireland's place in the intensely competitive global landscape. Globalisation's biggest effect has been to transform higher education and science – used here as knowledge not as disciplines) from a local concern into one of geopolitical significance.

Before 2000, Ireland had no national research policy, investment strategy or noteworthy international reputation in scientific research. Over recent decades, Ireland has been transformed, beginning with the launch of the PRTL, the formation of the IRCSET/IRSCHSS (predecessor to IRC) and SFI,¹ and the promotion of the Strategy for Science Technology and Innovation. Today, Ireland is a leading country in economic performance and innovation, a digital leader, on social inclusion indicators, PISA scores for reading and mathematics and higher education attainment.¹

Our research and innovation system has progressed from a very low base to where it is supporting and driving innovation with new knowledge and talented graduates to solve practical challenges and create new ways of doing things. The link between science and technology, innovation and job creation, and attractiveness to international mobile capital, has been a consistent policy theme.² Ireland has leading positions in immunology, agricultural science, neuroscience and behaviour, pharmacology and toxicology, and material sciences.³ Knowledge Transfer Ireland (KTI) reports strong activity for university-based research-industry collaboration.⁴ Public and private expenditure on R&I (i.e., Gross Expenditure on R&D or GERD) has increased from €2.6 billion in 2011 to an estimated €4.7 billion in 2021.⁵ Trust in science is high; higher than the UK, Italy, Germany, Norway, and Poland.⁶

While great progress has been made – a step change is now required. Ireland has a relatively weak national system of innovation at a time when global competition is accelerating.

¹ PRTL = Programme for Research in Third Level Institutions; IRCSET = Irish Council for Science, Engineering and Technology; IRCHSS = Irish Research Council for Humanities and Social Sciences; IRC = Irish Research Council; SFI = Science Foundation Ireland

Whereas Dublin, Cork and Galway have diversified into high-value-added areas, peripheral regions are dominated by an older manufacturing base with evidence of widening regional inequalities.⁷ Collaboration has been a growing feature of education and research but linkages between the R&I community, enterprise and indigenous firms remain weak.⁸ Public expenditure on R&I is increasing, but it remains comparatively low, just above Mexico.⁹

Research & Ireland (R&I) is understood as something undertaken by HE but there is insufficient recognition of innovation diffusion and the role of people, skills and social innovation.¹⁰ Whereas regionalism is increasingly part of the national policy discourse, place-based smart specialisation is not well understood or embedded in policy or practice, including by the R&I community.¹¹

I want to refer to three high-level ideas which should influence our approach to policy going forward.

1. Global Science System & Global Enablers
2. People/Talent
3. Regionalism & Innovation

1. Global Science System & Global Enablers

Before the internet, science was organised and produced solely in national science systems.¹² Today, doing fine is no longer sufficient. How well our system and institutions perform in a global context matter.

Two trends are emerging – and the message is consistent.

First, the centre of gravity is shifting eastward and southward as new players and new mega-regions emerge and wield more power and influence.¹³ Many more nations actively participate in an increasingly multipolar world rather than one dominated by a few big powers.¹⁴ More significantly, there is a significant pipeline of universities and countries engaged in global science.¹⁵ China-USA tensions in science and technology may be the focus of geo-political attention but 64 countries are now listed among the top 500 (ARWU²) for 2023 compared with only 39 in 2003.

Second, the global science system is more open but also more competitive. Countries and HEIs are competing with others which were little known several decades ago. Today, participation in global networks, open science systems and digital platforms are essential enablers.¹⁶ Internationally co-authored papers, as a percentage of all scientific papers, have more than doubled over the past 20 years, accounting for all the output growth by scientifically advanced countries.¹⁷ International collaboration accounts for increased numbers of patents, exceeding the performance of in-country patents.

The formation of European University consortia and the expansion of Horizon Europe – financially and geographically – signals the EU’s geopolitical ambitions.

However, it is not clear to what extent these factors influence Irish thinking. PRTLII changed the policy focus, but it has not evolved much since then. *Impact 2030* is inward-looking. EU membership and collaborations are vital, but our relationship is driven by transactional

² ARWU – Academic Ranking of World Class Universities otherwise referred to as the Shanghai Ranking

interests. We don't have a national R&I system and we have too many individual agencies (61?) pursuing their own strategies. The last (and only) survey of infrastructure was in 2007. DFHERIS³ and Research Ireland are timely, but they are just a start.

Without an integrated national policy and research system, Ireland will continue to struggle. As the Taoiseach has said, "a deep knowledge base and a commitment to expanding knowledge is essential if Ireland is to thrive in a world which is constantly throwing up new challenges"¹.

Success starts with mapping our R&I system; who is doing what, what are our strengths, and how are we spending our money and on what?

2. People/Talent.

Educating and training, and recruiting, attracting, retaining and supporting talent is key to our continued success and future.

The financial crisis of 2008 forced us to focus on economic fields. The adoption of NRPE⁴ as **the** national research strategy coincided with the marginalisation of the HEA in research policy. The strategy for science, technology and innovation cemented the shift to techno-science.¹⁸

In its narrowest interpretation, people are seen primarily as economic entities;¹⁹ in contrast, a broader framework argues human capital has four aspects: cultural, social, economic and capital.²⁰ Over the decades, there has been a gradual shift from the broader concept to one in which HE is seen primarily as an arm of economic policy, often depicted as a tension between the knowledge society vs. knowledge economy.²¹

The formation of Research Ireland opens a new chapter.²² In thinking about an ambitious future strategy for Ireland, we must strike a better balance between high-risk/frontier science and supporting ECR⁵s, and between high-quality, world-competitive fundamental research and application-focused R&I – across all disciplines. Investment in new knowledge and young people is essential. Vital also is to remove actual/perceived conflicts of interest between the chief science advisor and head of Research Ireland.

As Maria Leptin, the current President of the ERC,⁶ has said:

...investing in research is not like investing in anything else. It is easy for citizens to see what you are getting if you build a new road or a hospital or raise pensions.... In reality what we are getting when we invest in frontier research is an increased understanding of the world, whether it be the physical world, the living world or the social world.²³

There are implications for doctoral education. It's important to ensure the IRC model is not lost. While we grow the knowledge/skills base we must grow the quality of R&I jobs. Ireland has too few PhD-graduates employed outside higher education; many employed in the enterprise sector are in non-research roles.²⁴

³ DFHERIS = Department of Further and Higher Education, Research, Innovation and Science

⁴ NRPE = National Research Prioritisation Exercise

⁵ ECR = Early career researchers

⁶ ERC = European Research Council

At the same time, it is important to acknowledge Ireland operates with constraints. As institutions and a country, we can't be comprehensively excellent.

3. Regionalism and Innovation

In 2022, the Irish government set out a progressive, even radical, vision of a unified tertiary system whereby, irrespective of where learners enter FET⁷, HE, or a research career, they are in a single system which responds to individual talents, ambitions, and motivations.²⁵

Process, product and social innovation can be equally, if not more, powerful than technological innovation. By linking skills with R&I and regional policy it is clear that innovation occurs across all social and economic activity. In the future, sustainable social and economic development will require human capital in the broadest sense: *graduates from all levels of education* who are capable of creativity and critical thinking, initiative, and independent action.

For small countries and regions – such as Ireland – it can be more difficult to build the required capacity to innovate. Regional ecosystems amplify the advantages of collaboration and proximity for innovation and knowledge flows. FET is a key contributor to the innovation system – but too often, it is an untapped resource.²⁶ This requires closer engagement between universities, other HEIs and FET, with other regional stakeholders, without which it will be impossible to unlock the potential of smart specialisation.²⁷

This means developing strategies which encourage and support the smart use of talent and resources to build up regional advantages and attributes, be it wind, marine, agriculture, culture, heritage, etc. – powered by digital and green technologies – and elevated to a higher level as national/global centres of innovation which can attract and retain mobile talent (students, researchers and professionals) and draw in mobile capital and businesses.

Ultimately, the objective is to reject petty rivalries in favour of “maximising capacity beyond individual capabilities.”²⁸ After all, it is people – all our graduates – who catalyse knowledge, contribute to a shared pool of ideas throughout society and drive and lead innovation, *not* the institutions.²⁹

To conclude, in summary, I offer the following as the key priorities moving forward for the R&I landscape in Ireland.

- Educating and training, and recruiting, attracting, retaining and supporting talent is key to our continued success and future.
- We should recognise and address the fact that Ireland has a relatively weak national system of innovation, with weak linkages between the R&I community, enterprise and indigenous firms.
- We need to invest more in R&I. While it is increasing, Ireland remains comparatively low, just above Mexico.

⁷ FET = further education and training

- We need a more comprehensive understanding of innovation diffusion and the role of people, skills and social innovation.
- Our policy focus needs to recognise that R&I operates in a global context that is now more open and competitive.
- We need a well-integrated national R&I system, moving away from having many individual agencies pursuing their own strategies.
- We should strike a better balance between high-risk/frontier science and supporting ECRs, and between high-quality, world-competitive fundamental research with application-focused R&I – across all disciplines.
- We can't be comprehensively excellent. We should identify specific fields of inquiry and investment.
- Unless we promote/ensure closer engagement between universities, other HEIs and FET, along with other regional stakeholders, it will be impossible to unlock the huge potential of smart specialisation.

From the vantage point of 2000, it would be difficult to comprehend the scale, ambition and internationalised scope of Irish higher education and research. The underlying ambition of our science policy must be towards positioning Ireland as a European, even a global, leader. Our social, cultural, economic and ecological sustainability requires nothing less.

¹ Hugo Hollanders, Nordine Es-Sadki, Aishe Khalilova, & Stevenson, A. (2023). *European Innovation Scoreboard 2023. Country Profile Ireland*. <https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation->; Sprong, S., & Maître, B. (2023). *Thematic Report on Poverty and Social Inclusion Indicators*. <https://www.esri.ie/news/ireland-is-one-of-the-top-five-european-countries-on-some-social-inclusion-indicators-but-lags>; <https://www.asti.ie/news-campaigns/latest-news/irelands-15-year-olds-are-top-performers-in-international-study/>; <https://www.siliconrepublic.com/business/ireland-digital-leaders-study-bearingpoint>

² Department of Enterprise, Jobs and Innovation (2013) "Government continues to use research and innovation to drive job creation in Budget 2014", Accessed 30 November 2014, from <http://www.djei.ie/press/2013/20131015a.htm>.

³ IDA Ireland. (n.d.). *Facts about Ireland 2023*. [https://www.idaireland.com/getattachment/ebbe6731-4027-44a5-b7e1-f5ca4e1d6cb4/IDA-Facts-about-Ireland-2023-\(2\).pdf?lang=en-IE&ext=.pdf](https://www.idaireland.com/getattachment/ebbe6731-4027-44a5-b7e1-f5ca4e1d6cb4/IDA-Facts-about-Ireland-2023-(2).pdf?lang=en-IE&ext=.pdf); see also HERG Group. (2021). *Ireland's Higher Education Research System. A Review by the Higher Education Research Group*. P19-21. <https://www.knowledgetransferireland.com/Reports-Publications/Ireland-s-Higher-Education-System-2021-HERG-Report.pdf>

⁴ KTI. (2022). *Annual Knowledge Transfer Survey. 2022*. <https://www.knowledgetransferireland.com/Reports-Publications/Annual-Knowledge-Transfer-Survey-2022.pdf>

⁵ Harris, S. (2023, June 27). *Scientific Research. Written Answers*. Dáil Debates. <https://www.kildarestreet.com/wrans/?id=2023-06-27a.2244>; see also CSO. (2023). *Business Expenditure on Research and Development 2021-2022*. <https://data.cso.ie/table/BSA02>

⁶ Kearns, D. (2022, May 25). Nearly half of Irish public does not trust the Government to be honest or tell the truth, according. UCD University Relations. <https://www.ucd.ie/newsandopinion/news/2022/may/25/nearlyhalfofireishpublicdoesnottrustthegovern>

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⁷ European Commission. (2023). *2023 Country Report - Ireland* (SWD (2023) 607 final; Staff Working Document). https://economy-finance.ec.europa.eu/system/files/2023-05/IE_SWD_2023_607_en.pdf; Hugo Hollanders, Nordine Es-Sadki, Aishe Khalilova, & Stevenson, A. (2023). *European Innovation Scoreboard 2023. Country Profile Ireland*. <https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation->; OECD. (2023). *Regional Report - Ireland*. <https://www.oecd.org/regional/oecd-regional-outlook-2023-country-profiles-ireland.pdf>

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⁹ DFHERIS (2022) *The Research and Development Budget, 2021-2022*. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwj3hr7a9J6DaxXEUUEAHaATAIkQFnoECA0QAw&url=https%3A%2F%2Fassets.gov.ie%2F254856%2F0d22ff48-8df7-47c2-8213-48c8d549ca51.pdf&usq=AOvVaw3aefdP6GaOrzlpf1yPwjE9&opi=89978449>

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¹² Marginson, S. (2022). What drives global science? The four competing narratives. *Studies in Higher Education*, 47(8), 1566–1584. <https://doi.org/10.1080/03075079.2021.1942822>

¹³ Note actions by the European Commission to strengthen ties to Africa. https://ec.europa.eu/international-partnerships/africa-eu-partnership_en; MacGregor, K. (2022, February 20). Research at the heart of Europe, Africa’s new Innovation Agenda. *University World News*.

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¹⁵ Hazelkorn, E. (2020). Geopolitics of Higher Education. What do Global University Rankings Tell Us. In Lee, J. (Ed.). (Forthcoming). *U.S. Power in International Higher Education*. New Jersey: Rutgers University Press.

¹⁶ Marginson, S. (2022). What drives global science? The four competing narratives. *Studies in Higher Education*, 47(8), 1566–1584. <https://doi.org/10.1080/03075079.2021.1942822>

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