

Submission to the National Research and Innovation (R&I) Strategy

Part One

A strategic direction for research and innovation which places it at the centre of the national response to major economic, environmental, and societal challenges

Q1.1 How should the next Strategy articulate the role of research and innovation as a key enabler of addressing significant challenges (transition to a green, digital, and sustainable, knowledge-based economy)? What impact should research, and innovation have on addressing such challenges?

Sustainable growth is a key priority for Project Ireland 2040, which stresses the need for a transition to a green, low-carbon, resource-efficient economy. Innovation is essential to succeed in disassociating growth from natural capital utilisation and is therefore the key to enabling sustainable and smart growth to go hand in hand. Research and innovation strategies will need to foster green growth. Ensuring innovation for sustainable growth requires improving the support for new entrepreneurial firms that aim to deliver more radical eco-innovations and challenge existing firms and business models or deploy new environmental technologies. Improving access to finance, knowledge, and skills development in order for SMEs to boost their resource efficiency and develop new products and services that are more environmentally friendly. Enhancing international and interregional co-operation on innovation for sustainable growth.

Q1.2. How can the Strategy demonstrate the importance of research and innovation across higher education and industry for Ireland's economic recovery and sustainable growth? How can research and innovation be recognised as central to recovery and building resilience when faced with pressing sectoral challenges and financial constraints?

Research and innovation system plays a critical role in improving productivity levels, fostering competitiveness, and creating and attracting high value jobs to Galway and the region. An array of academic research confirms that high levels of investment in research and development can act as a critical factor in encouraging innovation, and in supporting sustainable economic development in the long term. As a result, the consensus among international bodies is that governments must support research and development activity because the costs and risks for enterprises – particularly for SMEs – are considerably high. Furthermore, the European Commission's "2020 Semester: Country Report – Ireland" noted that Ireland can improve the productivity of domestic enterprises – particularly SMEs – by using more direct funding instruments to stimulate research and innovation and that the lack of investment in research and innovation in domestic enterprises remains an underlying weakness in the Irish economy. On this basis, it is clear that research and innovation will be instrumental to achieving effective regional development in Ireland, allowing our regions to deliver on the vision and objectives of the NPF and the RSES of the Northern and Western Region.

Q1.3. How can the Strategy articulate the value of human capital from the research system in meeting high-end skills needs? What should the objective of the next Strategy be in relation to identifying human capital needs from the research system?

A region's research and innovation capabilities act as a significant component in attracting companies involved in Science, Technology and Engineering. As of 2020, 30.5 per cent of the Northern and Western Region's active population were working in Science and Technology, which was below the corresponding Irish average (35.4%) and the EU 27 average (34%). As of 2020, 9.7 per cent of the Northern and Western Region's active population were employed as scientists and engineering, which was below the corresponding Irish average (11.1%) but above the EU 27 average (7.6%).

The degree to which a region can attract high value-added jobs depends on a variety of factors – including but not limited – to the region's research and innovation capacity. In 2020, employment in "Knowledge Intensive Services" and "High / Medium-High Manufacturing" – sectors which consisted of high value-added jobs and would interact greatly with the research and innovation system – accounted for 44.5% of the total labour market in the Northern and Western Region, which was 1.9 percentage points below the EU 27 average and 6.7 percentage points below the State average. Enhancing the Northern and Western Region's research and innovation capacity should allow the region to improve its performance in terms of attracting high-valued jobs.

A significant step in enhancing Galway and the Northern and Western Region's capacity is the proposed STEM Building for GMIT. The proposed project is designed to provide GMIT with a new high-quality STEM Building at its Galway Campus, allowing GMIT to better accommodate existing STEM students and to increase student enrolment to meet demand in STEM-related courses, while also delivering a building which invites and creates a learning environment for our students. This project has been identified as the number one priority project in the GMIT Masterplan and Strategic Plan 2019-2023, reflecting the growth in STEM enrolments which has been achieved and which is projected to continue. As GMIT develops with its partners into a Technological University (TU), its focus will continue to be on the preparation of graduates for professional roles in a rapidly changing technological world and to have a positive impact on our region. It is critical that GMIT invests in new STEM laboratories to accommodate modern technologies which will enhance the learning environment for our students. This development will also facilitate GMIT to continue to build on our close partnership with our stakeholders in the areas of Medical Device Engineering through the Enterprise Ireland funded Technology Gateway and the Marine and Fresh-Water Research Centre which is in receipt of significant EU research funding under Innovation 2020 and Horizon 2020. Supporting this project to completion will further demonstrate a commitment to balanced regional development and the establishment of Technological Universities across Ireland.

To identifying human capital needs from the research system greater collaboration between Galway and the region's enterprise base and our research assets / Higher Education Institutes needs to be facilitated. Greater networking opportunities – through regularly organised regional smart specialisation forums – could provide opportunities for enterprises and researchers to discuss potential areas of collaboration, which may lead to the development of future commercial opportunities or operational efficiencies in our region's enterprise base. Furthermore, additional resources should be provided for greater regional promotional activities of the research services offered by our region's research assets and Higher Education Institutes and the financial incentives and grant schemes that are available to enterprises undertaking research and development.

Q1.4. How do we frame our national policy to ensure that we have a well-balanced system of research to enable Ireland to be at the forefront of global research and innovation?

To ensure we have a well-balanced system of research to enable Ireland to be at the forefront of global research and innovation, there needs to be continuous and rigorous engagement with industry

on where the gaps exist and ongoing efforts to support collaboration. In the modern global economy, it can no longer be expected that single teams or even countries can provide the necessary scale and scope of resources required to conduct research and innovation. There needs to be an increase in transnational cooperation which can bring together resources, disciplines, and scientific excellence, thus achieving a critical mass, which could not be attained on a national level.

We need to strengthen and complement the national research infrastructure through linking the research system to centres of excellence internationally and foster partnerships through involvement of international research teams.

Q1.5. How should the role of research for policy be supported and positioned in the next Strategy?

Adopt a regional approach for Ireland's Research and Innovation Strategy. To achieve this, additional resources provided to enhance the region's research and innovation capacity should be delivered using a smart specialisation approach, allowing the research and innovation system of the Northern and Western Region to support the region's actual sectoral strengths, using regional and local knowledge. This will ensure that policy makers fully utilise funding resources in a far more efficient manner, while allowing regions to utilise self-identified competitive advantages for the economic benefit of their own geographical areas. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

Furthermore, in the context of the European Regional Development Fund (ERDF) Regional Programmes, it is important to note that a key enabling condition for funding interventions under "Policy Objective (PO) 1: Smarter Europe" is the development of and alignment with the Member State's S3. Funding interventions under "PO 1: Smarter Europe" – which will seek to promote innovative and smart economic transformation – will act as a key support mechanism in the implementation of the RSES. Therefore, bringing a regional dimension to the S3 process in Ireland will simultaneously satisfy a key enabling condition under the ERDF Regional Programmes – where the Northern and Western Regional Assembly acts as a Managing Authority – while supporting the implementation of the economic elements of the RSES.

Q1.6. What should the next Strategy's ambitions be in terms of research and innovation as an enabler of balanced regional growth?

Adopt a regional approach for Ireland's Research and Innovation Strategy. To achieve this, additional resources provided to enhance the region's research and innovation capacity should be delivered using a smart specialisation approach, allowing the research and innovation system of the Northern and Western Region to support the region's actual sectoral strengths, using regional and local knowledge. This will ensure that policy makers fully utilise funding resources in a far more efficient manner, while allowing regions to utilise self-identified competitive advantages for the economic benefit of their own geographical areas. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential.

There is evidence in the West already of the tremendous R&D capabilities. Mike Mahony, CEO and Chairman of Boston Scientific has congratulated their Galway facility as being a R&D global leader across all their international locations.

It is imperative that the Northern and Western Region's research and innovation capacity is enhanced, particularly considering the region's classification as a "Transition Region", "Lagging Region" and "Moderate Innovator". Greater investment should be allocated to the research facilities of individual Higher Education Institutes, research centres⁴¹ and technology gateways based in the Northern and Western Region.

Q1.7. How should the next Strategy articulate the role of our research and innovation system in driving connectivity and collaboration on an all-island, EU and international level? How should our national priorities draw upon and align with revised European Research Area priorities?

To drive connectivity and collaboration on an all-island, EU and international level, a priority of the strategy should be creating international and all-island collaboration and partnerships of different actors – from university and industry. By interacting and working together this would create mutual beneficial learning and synergies. International and all-island cooperation brings together resources, disciplines, and scientific excellence, thus achieving critical mass for tackling global challenges. Ireland needs to coordinate our activities to ensure that our national and EU policies are mutually consistent.

Q1.8. Are there any other strategic priorities not covered in Part One above?

Part Two

Delivering on the vision across six areas of strategic action

Q2.1 What could the role of a mission-based approach to solving grand challenges be within the national R&I ecosystem? What structures could be used to deliver on this? How do we reconcile a mission-based approach with Research Prioritisation?

Q2.2 How can we ensure that we support enterprises to engage in research, development and innovation or become more research, development, and innovation active? How can we encourage greater levels of industry and academic collaboration or collaboration between SMEs and multinational companies? How can we support innovation in and of itself within enterprise? How can we improve the knowledge transfer system?

Explore the possibility of enhancing grant relief rates on research and development funding schemes and incentives and providing more direct funding to enterprises undertaking research and development activities. The consensus among international bodies is that governments must support research and development activity because the costs and risks for business – particularly for SMEs – are notably high but the economic benefits for the economy are well documented⁴³. Furthermore, the European Commission's "2020 Semester: Country Report – Ireland" noted that Ireland can improve the productivity of Irish firms - particularly SMEs — by using more direct funding instruments to stimulate research and innovation and that the lack of investment in research and innovation in domestic enterprises remains an underlying weakness in the Irish economy. Within this context, it is imperative the policymakers explore the possibility of enhancing the grant relief rates associated with research and development incentives and

schemes for enterprises – particularly for SMEs – and in providing more direct funding sources to enterprises undertaking research and development activities.

Reinforce the importance of the ERDF and Horizon Europe in supporting research and innovation in Ireland. Through successful industry case studies in the Northern and Western Region, the new National Research and Innovation Strategy should highlight the benefits of enterprises that have successfully applied for funding under the ERDF and Horizon 2020 for research and development activities. These case studies should also highlight how such research activities enhanced the financial wellbeing of these enterprises or their contribution to the region's economy.

Q2.3 How do we deliver a pipeline of talent for academia, industry, and public service? How can we best support researchers on their career pathway?

Provide greater financial resources to support more research and PHD positions in the Northern and Western Region's Higher Education Institutes and research assets. Additional resources in this regard should aim to enhance the capacity of these organisations to undertake high quality and industry relevant research for our region's enterprise base, particularly for SMEs.

To support researchers on their career pathway, you showcase and highlight trailblazers in their areas of specialisation. What was their career pipeline? How did their successful journey come about? If we are to showcase those examples it gives people a template or a wireframe of how they can also progress in their fields. Academic Mentorships is also a great opportunity to benefit from the advice and support of a senior academic colleague. It can open doors of opportunities, direct resources, provide feedback on research and facilitate networking.

Q2.4.1 What are the key priorities in determining research infrastructure needs across the system, both for higher education and for industry? How can we ensure best value for money for investment in research infrastructure?

The European Commission's "Regional Innovation Scoreboard" which assesses the innovation performance of regions across Europe, providing a comparative assessment of the performance of innovation systems across 240 regions in the EU is a good indicator to determine research infrastructure needs across the system. As per the latest results, the Northern and Western Region is now the only region in Ireland to be considered a "Moderate Innovator" - which is a region to record an innovation index score between 70% and 100% of the EU average - whereas the Southern Region and Eastern and Midland Region are classified as being "Strong Innovators" i.e., regions with an innovation index score between 100% and 125% of the EU average. Although the region's overall innovation index score has improved since 2014, the Northern and Western Region continues to record notable weaknesses - relative to the EU average in 2021 - in terms of:

Research and development expenditure in the private sector

Research and development expenditure in the public sector

Employed ICT specialists

Employment in knowledge-intensive activities

Patent applications

Trademark applications

Design applications.

Q2.4.2 What support and structure needs to be provided to embed good research practices across the system? How can researchers be incentivised to engage with this agenda?

All research funded organisation must have policies, structures and training in place that enable researchers to understand and adopt good research practice. Training should be provided for researchers in good research practice. Researchers and organisations should encourage practises that promote a positive research environment so that research can flourish – Providing support for collaborations, undertaking, and recognising peer review and advisory board activities, ensuring a safe zone/ culture for researchers to collaborate with each other.

Q2.4.3 Do we need to review or reform public funding structures for research and innovation? What should public funding priorities be over the course of the next national Strategy?

Q2.5.1 How can the Strategy best ensure that it delivers on regional priorities and promotes regional balance while pursuing excellence and impact? How can the TU sector be supported to drive their research agenda?

With the European Commission downgrading the Northern and Western Region from its previous status as a “More Developed Region” to a “Transition Region” for the funding period of 2021 to 2027 and the European Parliament’s Committee on Regional Development also categorising the Northern and Western Region as a “Lagging Region” in their report titled “EU lagging regions: state of play and future challenges”, we are looking for positive discrimination for the region in terms of ceasing on the additional funding opportunities that we are eligible for as a result of being downgraded. This means that for €100 invested by the government in the North West Region the European Commission pledge to contribute €60.

Adopt a regional approach for Ireland’s Research and Innovation Strategy. To achieve this, additional resources provided to enhance the region’s research and innovation capacity should be delivered using a smart specialisation approach, allowing the research and innovation system of the Northern and Western Region to support the region’s actual sectoral strengths, using regional and local knowledge. This will ensure that policy makers fully utilise funding resources in a far more efficient manner, while allowing regions to utilise self-identified competitive advantages for the economic benefit of their own geographical areas. This would enable using a sector or cluster-like policy concept not only to reinforce regions in their most advanced industrial sectors, but also to diversify their economic bases in a smart way, in the most promising areas with the most socio-economic potential. Furthermore, in the context of the European Regional Development Fund (ERDF) Regional Programmes, it is important to note that a key enabling condition for funding interventions under “Policy Objective (PO) 1: Smarter Europe” is the development of and alignment with the Member State’s S3. Funding interventions under “PO 1: Smarter Europe” – which will seek to promote innovative and smart economic transformation – will act as a key support mechanism in the implementation of the RSES. Therefore, bringing a regional dimension to the S3 process in Ireland will simultaneously satisfy a key enabling condition under the ERDF Regional Programmes – where the Northern and Western Regional Assembly acts as a Managing Authority – while supporting the implementation of the economic elements of the RSES.

Regarding the TU sector, Galway Chamber is calling for accelerated support for the amalgamation of GMIT, LYIT and IT Sligo into the Connacht-Ulster University to achieve Technological University (TU) status.

Q2.5.2 How can we best support the development of all island collaboration on research and innovation?

Strategic partnerships, like the Connacht-Ulster Alliance, which is aimed at achieving TU status, is a great example of collaboration. As one entity, the new distinctive TU will act in a coherent manner

supporting the needs of enterprises, especially SMEs, across the region through collaborative research and enabling technology transfer to support economic and social prosperity. It will provide research-informed teaching and access to emerging technologies for all learners.

The TU will have the critical mass and academic depth to attract, educate, nurture, and retain talent in the West, North-West and cross-border region and will strengthen and benefit our region socially, economically, and culturally. As a TU of scale, quality, and impact we will have greater capacity for collaboration with international partners and our graduates will have excellent employment potential nationally and internationally.

Q2.6.1 How can we effectively ensure that knowledge is transferred as widely as possible to ensure greater impact of research?

Research institutions need to play a more active role in their relationship with industry in order to maximize the use of the research results. This new role⁹ requires specialist staff to identify and manage knowledge resources with business potential, i.e., how best to take a new idea to market, ensure appropriate resources (funding, support services, etc.) to make it happen, and to obtain adequate buy-in by all stakeholders.

We need to effectively utilise knowledge transfer offices in these research institutions, improving collaboration and exploitation of research results and their uptake by business. There also should be a pooling of resources among research institutions, not only at regional and national level but also internationally also to ensure the greatest impact of research.

There needs to be the absolute immersion of academia with industry with real time collaboration.

Q2.6.2 What structures are needed at national/government level to support the research and innovation system? How can collaboration, coordination and engagement be strengthened? What should be the specific role of the new Department for Further and Higher Education, Research, Innovation and Science vis-à-vis other Government Departments?

We need:

- 1. To Showcase successes. There is a lot of really good stuff happening so from a government's point of view we need to talk about what is going well.*
- 2. Embedment of both industry and academia influencing at civil service level. There needs to be a robust system of real time engagement*

Q2.6.3 How do we ensure that we engage with multiple communities and stakeholders to both inform policy development and communicate the impact and relevance of R&I to citizens, communities, regions, and our national and EU partners?

How does your organisation engage on R&I issues with citizens and community organisations? What is your experience of engagement with national R&I organisations?

The citizens assembly model could also be used for research and innovation. This would ensure the right grouping of interested parties that would come together in a structured way, be it quarterly, meeting with Government. This would ensure that civil servants are fully informed about what's happening across all sectors of research and innovation. So, creating a forum of quarterly meetings, representative of a broad community.

Galway Chamber plays an active role in contributing to key policy and stakeholder bodies in the region, participating in numerous committees, steering groups, and boards.

These include Galway Technology Centre, Galway City Innovation District, Chambers Ireland Board, Western Development Commission (WDC) Policy Forum, Strategic Policy Committees, Local Community Development Committees, GRETB, GMIT Governing Body, Western Regional Enterprise Plan, Regional Skills Forum.

Galway Chamber's Board of Director also includes representatives from both NUI Galway and GMIT.

Q2.8 Are there other areas that require action that you would like to include in your submission?