Submission to the Consultation on the National Smart Specialisation Strategy

JULY 2021

The Technological Higher Education Association (THEA)[1], representing the institutes of technology and emerging technological universities, welcomes the opportunity to make a submission to the consultation on the National Smart Specialisation Strategy (S3). The consultation paper is comprehensive, and THEA strongly endorses the strong drive towards regional specialisation articulated within it. Therefore our submission is limited to a small number of points, listed below.

General Points

- Ireland is a small country compared to other EU Member States, however it is THEA's position that it is entirely sensible and feasible to build R&I capacity and capability with consideration for thematic strengths in different regions.
- This need for a regional consideration in developing R&I is reinforced by the disparity in R&I capability between our NUTS 2 regions (as captured in the EU's Regional Innovation Scoreboard), with the North-West Region classified at a lower level compared to the other two regions.
- Technological universities (TUs) and institutes of technology (IOTs) are referenced in *Project Ireland 2040* and the *Programme for Government 2020: Our Shared Future* as drivers of regional development. Therefore, the future S3 must consider the role of TUs/IOTs as central to regional specialisation, delivering skills, talent, R&I know-how and support for entrepreneurs, spin-outs and start-ups, particularly in regions where they are the sole higher education provider. This would build on their key roles in delivery of New Frontiers, the Technology Gateway Programme, and multiple Regional Technology Clusters and Regional Enterprise Development Fund projects, and their increasing participation in SFI Centres and Technology Centres.

Innovation Diffusion

- THEA's member organisations have a strong role in innovation diffusion. For several years now, KTI's annual surveys have shown that the sector is responsible for over 50% (57% in 2019) of what

[1] www.thea.ie

they term 'Business Access to Research & Expertise', a measure of the number of research consultancy and collaborative research projects between industry and HE. Similarly, the sector was responsible for 24% of collaborative research and consultancy agreements with non-commercial entities in 2019, the second year that this data has been captured by KTI. Many of these projects with external partners are delivered via the Technology Gateway programme. As of June 2019, the 15 Technology Gateways had completed 3,227 projects with 1,935 companies across all 32 counties on the island. This external partnership focus in R&I complements the sector's activities in supporting entrepreneurs and new start-up/spin-in companies. The New Frontiers entrepreneurship development programme is run by the sector with EI; between 2012 and 2019, almost 3000 individuals completed Phase 1 of the programme. This track record places the TUs/IOTs in a strong position to contribute to enhanced innovation diffusion under a revised S3.

- KTI & TTSI have been transformative for knowledge transfer, but the TUs/IOTs have not benefitted from as much financial support from TTSI as the traditional universities. Despite this, for every €1 of research expenditure, TUs/IOTs are almost twice as likely to spin out a company or licence their technology than their comparators. Coupled with the growth trajectory in TU/IOT R&I activity, which already grew by over 30% between the 2016/2017 and 2018/2019 HERD surveys, this track record of knowledge transfer indicates a strong potential to deliver more in this area, and the TUs/IOTs are deserving of increased financial support through the TTSI3 successor, in support of enhanced regional diffusion of innovation. Funding for early-stage proof of concept to explore the commercial potential of innovative research needs particular attention.
- A common complaint by smaller companies is that it is difficult to navigate all the options for academic-industry engagement. Adding a cohort of "collaboration advisers" to KTI, who can discuss tailored options with companies (whether they are EI, IDA, Údarás or LEO clients) would help.
- In recent years there have been a number of new programmes launched to support regional development, by bringing regionally-based HEIs, companies and other societal actors together, with a strong element of R&I in the resulting projects. The connectivity between these programmes and projects, which include the Regional Technology Cluster Fund, and Regional/Border Enterprise Development Fund, should be optimised. For example, how do you ensure that Technology Gateway programme is serving the R&I needs of the members of the Regional Technology Clusters? The forthcoming National Clustering Policy and Enabling Framework, along with the revised S3, should provide the structure to connect the various elements mentioned above.

International Collaboration on RD&I:

- Targeting EU funding to support R&I is an important element of a national R&I strategy. However, EU funding is not a substitute for national investment, rather the former should build on the latter. While it may be important to set a target for financial drawdown from Horizon Europe, it is actually more important to ensure that the national funding structure is optimised to catalyse success in Europe. Adopting the Three-Pillar structure of Horizon Europe to structure the Irish research funding instruments would support this, providing funding for a balanced portfolio of R&I across all research disciplines and TRLs and involving all relevant actors.

- Horizon 2020 (2014-2020) introduced the opportunity to use Structural Funds (including ERDF) in synergy with Horizon 2020, to co-finance initiatives using the two funds, or to use ERDF to fund high-quality proposals that Horizon 2020 had insufficient budget to support but were awarded a 'Seal of Excellence'. Ireland unfortunately did not take strategic advantage of these opportunities. There are three main areas where ERDF could be used in conjunction with Horizon Europe:
    1) Providing additional funding to match the Erasmus+ European Universities Initiative (EUI) funding received by the Irish HEIs who are participating in seven of the first 20 European Universities Alliances.[2] The EUI is a flagship EU programme to strengthen cooperation in teaching and research across networks of leading European universities. It is strategically important that this significant Irish participation be facilitated with adequate resourcing in order to play leading roles in these Alliances, building on the relative regulatory and reputational advantages which already exist. The Council of the EU (May 2021) recently invited national governments to co-fund their participating HEIs to enable their HEIs to strengthen and deepen this cooperation, leading to joint study programmes, greater cooperation in research and enhanced international competitiveness. Many competitor countries are already providing this funding. Approximately €3.5 million per annum will enable Irish HEIs to play leading roles in these flagship European alliances, paving the way for significant innovation in European higher education and raising Ireland's profile and attractiveness as a European leader in higher education, research and innovation. This could be provided from ERDF (or the European Social Fund).
    2) Providing the match funding required for HEIs and research funders to participate in the Horizon Europe MSCA Co-funding of regional, national and international programmes (COFUND) programme.[3] COFUND is a programme where an entity (typically a research funder or research provider) competes for match-funding from the EU for a doctoral scholarships or postdoctoral fellowships programme. Ireland has a strong track record in securing funding from this programme,[4] but one barrier to participation, particularly among research funders, is having the national funding to match the EU contribution. This could be remedied by earmarking some ERDF funds for this purpose (it is acknowledged that many of the SFI Centres who are COFUND beneficiaries are part-funded by ERDF, so there is some ERDF/Horizon synergy there, but this is "by accident rather than by design"). In this manner, ERDF spend could catalyse increased success in Horizon Europe.
    3) Creating a Seal of Excellence programme for the MSCA Postdoctoral Fellowships, the flagship EU fellowship programme. Approximately 200 applications a year by talented researchers seeking to work in Ireland are submitted to the annual PF Calls, of which only around 30 are funded (15% success rate), not due to poor quality applications but due to lack of budget. High-quality applications which are not funded due to budgetary constraints are awarded a Seal of Excellence (SoE) by the EU.[5] 11 Member

[2] https://ec.europa.eu/education/education-in-the-eu/european-education-area/european-universities-initiative_en
[3] https://ec.europa.eu/research/mariecurieactions/actions/cofund
[4] A list of 17 Irish COFUND programmes funded between 2014 and 2019 can be found at https://www.iua.ie/for-researchers/marie-sklodowska-curie-actions/funding-calls-and-deadlines/cofund/.
[5] See https://ec.europa.eu/info/news/commission-awards-seal-excellence-certificates-2885-researchers-2021-may-25_en

States have put in place national programmes to award funding to SoE holders. For example, Lithuania is using Structural Funds to finance SoE holders. A portion of ERDF funding could be earmarked to fund SoE holders, and could potentially be targeted towards fellowships in areas relevant to the regional R&I priorities set out in the new S3.

Actions to improve the national or regional enterprise research and innovation system

- The consultation paper clearly articulates the main challenge for Ireland, that is, the amount of public funding invested in R&D and the associated business investment in same. The TU Act 2018 foresees substantial growth in R&I in TUs, including associated metrics which candidate TUs must meet prior to being designated as a TU and within certain periods of time after establishment.[6] As IOTs prepare for TU designation, growth in R&I is already evident: between the 2016/2017 and 2018/2019 HERD surveys, direct research expenditure in TUs/IOTs grew by 30%. Supporting R&I in TUs/IOTs is one way of achieving a better regional spread of R&I activity. However, overall Government investment in R&I will have to increase in order to "make room" for the necessary growth in R&I capacity in TUs. It will not be sufficient for the current investment to be more equitably distributed between the traditional universities and TUs. It would not be appropriate, or well-received, to grow the latter at the expense of the former. Considering their track record in supporting business innovation, the TUs/IOTs are well placed to help translate that public investment into business investment in R&I.
- Overall, Ireland needs to seek to establish a well-balanced system of R&I, which provides for the opportunity to carry out research across all disciplines and a wide range of TRLs, harnessing opportunities to take low TRL research "to the user" and to explore low TRL ideas generated through mid-high TRL work. One idea to facilitate this is to adopt the Three-Pillar structure of Horizon Europe at national level, with one Pillar to support fundamental research across all disciplines (led by IRC and including doctoral training programmes similar to the Horizon Europe MSCA and Research Infrastructure), one Pillar to support innovation in enterprise and commercialisation (led by EI), and one Pillar directed at Cluster/Challenge areas (led by SFI and to include some challenge-based funding). Other national funders can align their existing programmes across these three pillars, and if appropriate, work in cooperation with the Pillar leads (IRC, SFI or EI). As an example of this type of cooperation, the EPA already fund postgraduate scholarships with the IRC, where the IRC is the Lead Agency and the funding is provided by the EPA. In using the Three-Pillar structure for maximum benefit, thought will need to be given about how the outcomes from one Pillar can "feed-into" others where appropriate, e.g., fundamental research work leading to a spin-out company or licensing arrangement. Additionally, mirroring the Three-Pillar structure of Horizon Europe should place our researchers in a much stronger position to compete in Horizon Europe, allowing for maximum leverage of the national investment at EU level.

[6] A) At least 4% of students registered on programmes of study from NFQ Level 8 (typically Honours Bachelor's degree) to Level 10 (doctoral degree) must be research students. This must rise to 7% within 10 years of TU designation. B) The applicant TU must have PhD programmes and staff/students conducting research in no less than three fields of education (ISCED narrow field). This must increase to five fields within five years of TU designation. C) At least 45% of academic staff within the applicant TU must have an L10 (or equivalent) qualification. This must rise to 65% within 10 years of designation.