

27 March 2015

Interdepartmental Committee on Science, Technology and Innovation.

**Consultation in preparation for the development of a Successor to the Strategy for Science,
Technology & Innovation**

Maynooth University Contribution.

A Chara,

Maynooth University welcomes the opportunity to respond to the interdepartmental committee on Science technology & Innovation to contribute to a new strategy for Science Technology & Innovation. The establishment of national research priorities under SSTI -1 has had positive impacts on the research sector. *In toto*, the effect has been transformative in that (at least in this University) there has been a realignment of our research structures, hiring policies, and internal priorities to align our publicly funded research as far as possible to national agendas- this process is ongoing. The challenge now is to refine our national strategy to meet future needs and challenges without returning to a research ground zero. In this context the other external influence shaping our institutional strategy is the EU Horizon 2020 framework and especially the societal challenge definitions unfortunately the previous national priorities (NRP) do not align well with H2020 challenges. The essence of the Maynooth University submission is therefore twofold: 1) Evolution: A proposition to move from the 14 “Priority areas” defined research system (picking winners) to a 7 “Priority challenges” approach directly aligned to the EU. The benefit being that the focus is tighter, but less prescriptive on how to solve the problems research can answer; 2) Recommendations to sustain those scientific and technological capacities which will deliver the above effectively and cost efficiently. The response is structured in line with the consultation Pillar questions.

Pillar 1 Investment in STI & Key Goals & Targets.

It could be interpreted from the consultation paper that Ireland is embarking upon development of an R&D policy but our innovation policy is much less developed. Ireland needs to be much more ambitious and holistic with regard to developing a coherent, integrated, effective and comprehensive STI policy. Whilst an advance from the lower technology “readiness” levels in the national system is a necessary component (well catered for in SSTI-1), the need to create the breadth of components to advance that system for the future needs greater consideration. The consultation document is also prescriptive with regard to the understanding of “priority areas” largely defined by existing sectors. The assumption is that tomorrow’s jobs will be provided by the employers and industries of yesteryear- however this is a high risk strategy. There is a need to prepare for technological disruption hence we propose moving to a challenge approach which allows multidisciplinary teams, SME s and emerging sectors greater research opportunity.

What should Ireland’s ambition be in STI? Ireland is currently an innovation follower and lags other small developed countries in R&D intensity. Should we have more ambitious

targets for investment? How can that level of ambition be justified? Where would we target increased funding and how could this be justified?

Ireland needs to be more ambitious with regard to developing a coherent, integrated, effective and comprehensive STI policy to develop an advanced research and innovation ecosystem. Such a system would require the evolution of research excellence, the development of advanced human capital and a widespread deepening of enterprise competitiveness (especially in regions) to go hand in hand. The Universities and IoTs are the hub of such a system. This ecosystem is in place but certain aspects need support and nurturing and provide an important opportunity for research to enhance regional job creation. For example, the UK has recently recognised the value of the “creative economy” to regional enterprise and job creation, Ireland has a very strong creative sector yet its potential to absorb research and innovation investment or ability to convert investment to economic output is less developed than in the UK. Ireland has an opportunity to address this in transformed and increased SSH (Social Science/Humanities/Arts) funding. This is certainly not “more of the same” or an adjunct to STEM, but an essential component to identifying future opportunity. The key requirement is to develop a resilient and creative system for industries and sectors that do not yet exist or which will change out of all recognition in the next decade. Thus the first ambition in our strategy must centre on the development of human capital and link our research and our education systems such that research excellence is a feature of all human capital development in the system. The Universities are central to such a role.

Maynooth Recommendations:

1. Develop human capital and knowledge transfer in all its dimensions. This will require additional investment and re-alignment of research areas in the Arts and Social Sciences. Furthermore, it will require support for building capacities for disruptive and blue skies research in STEM areas (eg Quantum technologies)- as ever built on excellence and impact. The IRC will have a key role in this regard and should be resourced accordingly.

How can research prioritisation better serve our national objectives of a strong sustainable economy and a better society? How best do we identify emerging areas of opportunity and challenge i.e. horizon scanning?

Ireland needs to preserve the disciplinary breadth of our research excellence- for example financial industries (banking/high volume financial transactions,/ computing etc) are likely to be transformed by quantum technologies in the coming decade yet our existing research strategy hardly mentions this. Major problems such as Climate change, food security, and ageing are only tangentially addressed by the current NRP strategy yet these issues will shape Ireland of 2030.

It is essential we have the breadth of expertise and response capacity to meet these challenges and indeed to create the new industries. We propose that existing priorities move from an existing industrial sector focus to align with an EU “challenge” focus:

Maynooth Recommendations:

2. Reframe the existing research priority areas to align better with EU societal challenges. We move the priority from supporting a defined sector to addressing a defined priority grand challenge (eg security, ageing, climate change etc). This will encourage system resilience and avoid the “Irish Elk” problem- the problem of focusing resources on increasing scale in attributes that are destined for redundancy.

What actions needed to strengthen the number Innovation performers in MNC/broaden activity in indigenous sector?

Maynooth Recommendations:

3. In support of the above, use funding instruments to structure research and innovation ecosystem spanning the private and public sectors which delivers more startups, enhances sustainable competitive advantage at firm level and deepens and grows Ireland’s innovation performance and outputs.
4. Put in place stronger incentives for companies to conduct basic/advanced research, both in house and collaboratively with Universities; including modifying the R&D tax credit rules to support greater outsourcing of research to HEIs.

How can we further increase/strengthen the effectiveness of our international collaboration and engagement across all areas of STI investment in pursuit of economic and societal goals? What additional measures can be taken to maximise the engagement of industry as a partner in this regard? What additional measures could be taken to enhance Ireland’s participation in Horizon 2020 and other EU Programmes – industry, academia, SMEs and MNCs? Are there research policy or programme developments taking place at EU level where enhanced engagement by Ireland could provide opportunities for research collaboration and ultimate economic or societal benefit?

Maynooth Recommendations:

5. Interreg and similar non-Horizon 2020 programmes can impose severe burdens on Universities with regard to contract terms and conditions (hold harmless clauses), audit burden and low overheads. Increased engagement by DEJI and Irish agencies through lobbying could remove these bottlenecks to more effectively assist



HEI/PRO applications. In effect many of these schemes are unattractive, uninsurable, or even loss making for research organizations.

6. COST actions are essential gateway activities for Irish researchers to engage with the EU and must be sustained.
7. Specific bilateral co- funding research streams need developing with strategic partner nations. This builds on SFI ISCA awards to support Ireland's international /Foreign affairs strategies and support our work in key markets. Eg Brazil, China etc.
8. Specific ESA opportunities exist for Ireland which Maynooth University would welcome outlining in more detail in the context of the space/ and geotech industrial sectors.

How can Ireland harness the opportunities presented by the major developments [with regard to] Earth Observation?

Maynooth Recommendations:

9. Ireland has a lead in this regard hosting two of the world's leading academics in Geocomputation, with strong MSc programmes and an existing academic –industry hub in the National Centre for Geocomputation (NCG). The NCG and EPA should be empowered to build an EPA centre analogous to an SFI centre to deliver on this ambition.
10. Analogous to #8 An EPA climate change centre is urgently required. Again recent SFI support for climate change in Research professorship recruitment is appreciated. Again Maynooth University and partners in HEI and Industry would welcome outlining in more detail.

Pillar 8: Organisation & Developing Human Capital:

Maynooth Recommendations:

11. The new strategy should commit to increasing the overhead rate progressively over time to reflect the full economic cost of research. In effect research (and especially national priorities aligned research) are currently subsidized by the Universities.
12. In the absence of an overhead rate which properly reflects Full Economic Cost, put in place a dedicated equipment maintenance and renewal fund and include technical support as an eligible cost.
13. Establish a national facilities usage scheme accessible to researchers from the public research system and industry.
14. Put in place measures to support increased output of Masters and PhD level graduates with human and physical capital components. Continue to support the



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- introduction and implementation of structured PhDs in the context of the new framework for Postgraduate Education.
15. Subject to its further refinement, in consultation with funders and policy makers, the new researcher careers and employment framework should be adopted as a central part of the human capital component of the new strategy. In support of this a fund for Post Doctorate learning and development should be established.
 16. Mobility from industry into universities should be promoted including developing the “entrepreneur in residence concept” where experienced technologists help scout for IP and other exploitable ideas and concepts and promote their exploitation.
 17. Redundancy payments should be an eligible cost and be provided for in national research funding grants. An appropriate redundancy payments scheme should be put in place specifically for researchers.
 18. Gender equity. Maternity cover for researchers on funded programmes is not universal or harmonized. Maternity cover should be an eligible cost and be provided for in all national research funding grants for all staff levels.
 19. Establish a new Advisory Science and Innovation Council under the aegis of the Department of An Taoiseach.

This submission is aligned to a broader submission from the IUA. We endorse the comment from the committee that *“It is now timely to place Research Prioritisation and the focus on research relevance and impact within a broader context and to develop and articulate a vision for science policy across all disciplines (including STEM and AHSS) and in doing so incorporate policy around research to support the broader knowledge base and research to support the development of policy in key sectors of relevance to the economy and society (e.g. health, agriculture, marine, energy, environment, communications) and address key challenges”* We believe our suggestions support that ambition, and offer practical solutions that will enhance our national research and innovation system.

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