INNOVATION

2020

Second Progress Report

July 2017

Innovation 2020
2017 Progress Report

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Introduction

Innovation 2020, Ireland's cross Government Strategy for Research and Development, Science and Technology, was launched in December 2015 and sets out Ireland's vision to become a Global Innovation Leader, driving a strong sustainable economy and a better society. Containing 139 actions for delivery by 2020, the strategy provides the roadmap to delivering on this ambition. Annual progress reports on the implementation of Innovation 2020 are developed by a cross Government Implementation Group comprising relevant Government Departments, research funding agencies and the Chief Scientific Adviser to the Government.

This second Innovation 2020 Progress Report outlines the advances made on strategic actions in the period between the publication of the last report in July 2016 and June 2017. In total, 45 new actions have been initiated, 12 actions have been completed and 72 actions are continuing to progress. In the year since the last Progress Report, there have been three meetings of the Innovation 2020 Implementation Group covering a variety of topics such as the impact of Brexit on the research community, gender equality, research prioritisation, Research, Development and Innovation (RDI) funding, societal impacts and open science.

The key Innovation 2020 commitment to increasing public and private investment in research is making progress. Since the publication of the strategy in 2015, direct Exchequer funding of RDI has increased from €736m in 2015 to an estimated €761m in 2016.

The vision in Innovation 2020 for Ireland to become a Global Innovation Leader remains a central goal. In the 2016 Global Innovation Index, Ireland is ranked 10th out of 128 countries and is first for knowledge diffusion, which indicates that Ireland is a global leader in its ability to commercialise research. The European Innovation Scoreboard also shows that Ireland is a strong innovator, leading Europe in terms of innovative SMEs and employment in knowledge-intensive activities. While not a leader in terms of the amount invested in RDI, Ireland is leading Europe in terms of the employment and innovation impacts achieved on this investment.

Since the publication of Innovation 2020 in 2015, there have been a number of changes in the socio-economic climate, foremost of which has been the UK decision to leave the European Union. Public investment in RDI has become all the more critical as a result of Brexit, particularly with regard to helping Irish SMEs enhance their innovative capacity and diversify into new markets. Innovation 2020 remains relevant in the face of the Brexit challenge; the actions to increase research funding, optimise the research infrastructure, develop and attract world-class research leaders, enhance cross-national research collaboration and leverage these actions to increase enterprise engagement in RDI, will all serve to add to the resilience of the enterprise base. In addition, the current refresh of research prioritisation and the review of State RDI supports will provide an opportunity to reassess the alignment of Irish research and research funding priorities.

This year's Progress Report highlights the significant work being done by all public research funders in the Irish innovation landscape, but it is only through sustained increases in public research investment that we can continue to build on this progress. Prioritising public RDI expenditure means that we can continue to support our researchers, further develop our research infrastructure, build on our innovation excellence, drive the export potential of Irish SMEs and help all our industries stay relevant in a changing socio-economic climate.

Innovation in Enterprise

Action No. 2.1	Research Prioritisation (RP) as basis for research investment in support of enterprise
Description	a. Continue to target competitively-awarded research investment in support of enterprise towards the priority areas. b. Building on the accomplishments to date under RP, the 14 priority areas will be positioned within six themes: ICT, Manufacturing & Materials, Health and Medical, Food, Energy, and Services & Business Processes.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	DBEI, EI, IDA, SFI, DAFM, MI, Teagasc, IRC, HRB, DCCAE, SEAI and other research funders
Progress Update	**IDA** continues to support companies via RD&I grants and Feasibility studies in Research Prioritisation themes that align with IDA sectoral strategies. The vast majority of **SFI** funding is aligned with the 14 priority areas. The four new SFI Research Centres announced by SFI are aligned with the Research Priority areas (see Actions 2.2 and 2.6). Practically all of the research invited in **DAFM**'s most recent Call under its three competitive research funding programmes (FIRM, Stimulus & CoFoRD) related to the areas prioritised under RP and much of the research arising from the 'regular' part of this Call will support enterprise albeit at arm's length. In addition, this Call also contained a new industry co-funded instrument (Innovation Platform) directed at two areas - Agri Data, ICT & Sensors and Biorefining – and a sizeable grant award stemming from this is now under active consideration. The **Marine Institute (MI)** have noted that RP was a significant input to marine R&I strategy, as was the societal focus area of marine in Innovation 2020. Research Prioritisation areas map to the following Marine R&I areas: Marine Energy (Marine Energy), Sustainable Food Production (Marine Bio-resources), Future Networks and Communications (Advanced Tech) and Data Analytics, Management, Security and Privacy (Information and Spatial Technologies, Analytics and Modelling). All **Teagasc** Walsh Fellowships funded in 2017 were in two of the RP areas (Food for Health; Sustainable Food Production and Processing). The **IRC** have completed Call process for the 2017 Employment Based Programme and the Enterprise Partnership 2017 Call is currently open. The programmes are open to researchers in all disciplines however the RP areas would feature prominently in the awards. The **HRB** currently has a portfolio of active awards worth approx. €220m. The primary focus of HRB's research funding is in the areas of Research for Policy and Practice (44%), Integrating Infrastructures (26%) and Platform Science and Technology (23%). The remaining 7% of investment is spread across the RP areas. Marine renewable energy is a priority area under RP and **SEAI** supports this sector through an Ocean Energy Prototype Development Fund. This fund stimulates the

development and deployment of ocean energy devices and systems with an emphasis on industry-led projects. Since 2009, SEAI has grant-aided in excess of €14m to over 80 projects. These range from early stage proof of concept tests of novel technologies in laboratory facilities to real sea deployments of pre-commercial devices. In addition, SEAI supports ocean energy test site infrastructure development in Cork, Galway Bay and Belmullet Co Mayo.

In relation to the RP area Smart Grid/ Smart Cities, **SEAI** supports the National Smart Metering programme and, in addition, funds research in relation to Smart Grid as part of its national RD&D programme.

The **HEA**'s foundation investment supports public research excellence across all disciplines by:
- Putting central research support infrastructure in place;
- Offering permanent tenure to key PIs;
- Facilitating academic staff engagement in research activities.

In order to develop research capability in Priority Areas, the institutions require this foundation HEA investment which can then be used to attract competitive funding for the 14 areas/ six themes.

Where appropriate, the **EPA** collaborates with Enterprise Agencies in identifying innovative environmental solutions that could support the growth of the circular and green economy. EPA-Research funding supports innovation in technology for environmental protection and industrial compliance, and also includes supports to SMEs in relation to resource efficiency innovations and advancing of sustainable competitiveness. In 2016, under its Green Enterprise Scheme, the EPA has awarded 10 new projects to SMEs. The 2017 Green Enterprise Scheme was launched on the 5th May 2017 with a closing date of 9th June 2017. Examples of relevant 2016 EPA Research awards include:
- **Manufacturing & Materials; Service & Business Processes; Energy RP themes**: EU ETS and Competitiveness of Irish Industry, Innovation Water Technologies, Novel Eco-sensitive Wastewater Treatment Recovering dairy Industry Effluent NuTrientS, Water Re-Use in the Context of the Circular Economy; Algeopolymers
- **Food (Sustainable Food Production & Processing) RP theme**: Review national emission factors for methane emissions from livestock; The role of incentivisation in the development of biomethane production, using anaerobic digestion (AD)
- **Health RP theme**: Impact of NO_2 on health with particular emphasis on vulnerable groups, Green and blue spaces and health: a health-led approach.

In addition to the 2017 EPA Green Enterprise Call, examples of relevant topics included in the 2017 EPA Research Calls include:
- **Health RP theme:** Development of an Irish pollen forecast prototype; Assessment of Odour Emissions; Health Impacts of PM10/ PM2.5 in the Irish context linking air quality data to health surveillance data; Mapping and harmonisation of data and prioritisation of substances for human biomonitoring in Ireland; Environmental Noise, Health and Wellbeing; Assessment of the relative contribution of various sectors to the impact and persistence of antimicrobial resistance (AMR) in the environment; Assessment of the environment and health impacts arising from mercury-free dental restorative materials.

	o **Food (Sustainable Food Production & Processing) RP theme:** Targeted approaches to effective catchment management and Water Framework Directive Implementation in rural areas.

Action No. 2.2 a **APJ 2017 No. 93**	**Within the current cycle of RP, stimulate public research on Services and Business Processes and Manufacturing Competitiveness**
Description	a. Increase capacity in the higher education sector by appointing a number of 'star' researchers with proven track records of solutions-driven research in Services and Business Processes and Manufacturing Competitiveness, in collaboration with global leaders in enterprise.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	a. HEIs, SFI

Progress Update	The **HEA**'s foundation investment supports public research excellence across all disciplines by:
	   o Putting central research support infrastructure in place;
	   o Offering permanent tenure to key PIs;
	   o Facilitating academic staff engagement in research activities.
	In order to develop research capability in key areas like Services & Business Processes and Manufacturing Competitiveness, the institutions require this foundation HEA investment which can then be used to attract competitive funding for prioritised areas.
	
	SFI announced in May 2017 that it will invest €72 million over the next six years in four new world-class SFI Research Centres in Ireland. The following two Research Centres are directly applicable to this action:
	   o **Smart manufacturing IT and industrial automation systems**, led by Prof Conor McCarthy, University of Limerick;
	   o **Innovative techniques and processes in Additive Manufacturing**, led by Prof Denis Dowling, UCD.
	In addition, two new Research Professors in the field of Manufacturing Competitiveness relocated to Ireland in 2016.

Action No. 2.2 b **APJ 2017 No. 93**	**Within the current cycle of RP, stimulate public research on Services and Business Processes and Manufacturing Competitiveness**
Description	b. Incorporate enterprise-relevant services and business processes challenges in the proposed new challenge-based funding system (see Action 4.3).
Status	**Ongoing**
Implementation	2016-2020
Lead Responsibility	b. SFI, IRC
Progress Update	see Action 4.3

Action No. 2.3 APJ 2017 No. 92	**Put in place new cycle of Research Prioritisation**
Description	A market-led horizon-scanning exercise will be undertaken in order to identify strategic areas of commercial opportunity in global markets for Irish-based enterprises as the basis for the next cycle of RP, due in 2018. The exercise will take into consideration, inter alia, recent and likely future advances in science and technology, as well as the dynamics of international markets and global supply chains and policy developments.
Status	**Ongoing**
Implementation Date	2017
Lead Responsibility	**DBEI,** research funders, enterprise development agencies, key stakeholders
Progress Update	The development of a new cycle of Research Prioritisation is well underway and on target for delivery in Q4 2017. Consultants have been commissioned to produce reports on the evidence base which will feed into a refreshed cycle of RP. Work is underway, which involves members of the Innovation 2020 Implementation Group where appropriate, including membership of the advisory groups to support each strand of work. The three elements of the evidence base are: 1. A market-led horizon scanning exercise to identify strategic areas of commercial opportunity in global markets for Irish-based enterprises. 2. A technology futures exercise to present an informed assessment of technologies that are or will be critical to Ireland's economic and social development and how they will evolve over a 20 year timeframe. 3. An audit of progress on the current priority areas and new and emerging areas of national research strength and opportunity. Following the completion of the three strands of work outlined above, the evidence base will be evaluated. A Consultation Forum will take place in November 2017 with stakeholders, including the research community, to formulate policy recommendations appropriate to a refresh of Research Prioritisation. The Innovation 2020 Implementation Group will oversee the process with the final report being presented to Government for approval.

Action No. 2.4	**Optimising Enterprise RDI Supports**
Description	We will review the full range of State financial aid for RDI, both direct and indirect (tax credits, Knowledge Development Box), in terms of the level of support available and eligibility rules, to ensure that the needs of small and young firms are being catered for as well as those of larger, established firm. The review will also assess the incentives available internationally to ensure that Ireland's offering remains competitive.
Status	**Ongoing**
Implementation Date	2017
Lead Responsibility	**DBEI (SPD), EI, IDA Ireland and other relevant funders**

Progress Update	A **DBEI**-led 'Review of Innovation Supports for Enterprise' in ongoing and will be completed in 2017. The review will identify opportunities to increase the number of RDI performers and to intensify RDI activity. It will also assess the current range of supports to identify any overlaps or gaps.

Action No. 2.5	**Accessibility of enterprise research, development & innovation support**
Description	A comprehensive and enterprise-friendly directory of all enterprise supports and programmes will be developed and disseminated. Allied with this, national and regional events will be organised periodically to showcase and promote these supports to enterprise.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**DBEI,** EI/Knowledge Transfer Ireland, IDA, SFI, IRC, other stakeholders
Progress Update	**KTI** is working on a new web-based directory of innovation supports for companies interested in working with RPOs, with an aim to launch Sept 2017 at the KTI Summit. KTI also has plans for further website changes and is in discussion with EI IT.

Action No. 2.6 **APJ2017 No. 89/93** ACTION PLAN for JOBS	**Optimise network of technology and research centres**
Description	**a.** The network of *Technology Centres* will be strengthened by increasing their critical mass and affording them greater operational flexibility so that they can provide a broader range of research functions, while maintaining strong links to the HEIs and other Research Performing Organisations. **b.** The network of Technology Gateways will be strengthened to ensure good geographical and technological coverage and to maximise enterprise engagement. **c.** The network of Higher Education-based Research Centres will be developed to provide world-leading capacity in strategically important areas for the economy, while maintaining strong links to other RPOs. **d**. The identified enterprise need for RTO support, particularly in the areas of Advanced Manufacturing and Services & Business Processes, will be addressed, building on the existing network of centres. **e.** We will develop standardised key performance indicators and associated targets for measuring and enhancing the impact of the Technology Gateways, Technology Centres and Research Centres, including enterprise co-funding and movement of researchers into enterprise.
Status	**Ongoing / c. and d. Ongoing/ e. Complete**
Implementation Date	**a, b, c & d.** 2016-2020 **e.** 2016
Lead Responsibility	**a.** EI, IDA, DES, HEA, HEIs **b.** EI, DES/HEA **c.** SFI, DES/HEA **d.** IDA, EI, SFI, HEIs **e.** EI, IDA, SFI, HEIs
Progress Update	**(a)** From the ongoing evaluations of Technology Centres, review outcomes have resulted in the Learnovate Centre being approved for increased funding and

duration to support the companies involved in supplying and employing E-Learning technologies. The approval addresses aspects of increased scale and independence for the Centre which will advance over the coming years. A new Meat Technology Centre has been launched, focusing on the beef and sheepmeat sectors and involving companies representing the significant majority of exporters for that sector. The Irish Manufacturing Research Technology Centre continues to scale up and grow to critical mass and was formally launched in May 2017.

Following the review process a number of Technology Centres will be wound down in an orderly and effective manner, primarily as their target objectives and company base do not continue to match the Technology Centre model and requirements. This allows other Centres to scale subject to their funding proposals being of sufficient quality and robustly supported by industry. The reviews process is an ongoing one and further review outcomes of other Centres are expected over 2017.

(b) In 2016 three new Gateways were added to the Network based in Galway, Sligo and Carlow. The three new Gateways not only offer additional regional access points to the Network but they also add expertise in the areas of Medical Engineering Technologies (MET based in GMIT), Precision Engineering & Manufacturing (PEM based in IT Sligo) and Design Thinking (Design+ based in IT Carlow).

An Applied Internet of Things Cluster and an Engineering, Materials and Design Cluster were also established over the last 12 months to maximize the potential of the Technology Gateways working in these thematic areas and to ensure greater enterprise engagement by providing more geographical access points to relevant sectoral expertise.

The Applied IoT cluster is a consortium of five Gateways providing a single point of contact for companies looking to access technical capabilities for Internet of Things (IoT) research and development. The five Gateways are based in Tralee, Cork, Waterford, Athlone and Letterkenny while the Applied IoT cluster resource is based in Dublin. This geographic spread ensures local access for any interested companies while the presence of the cluster means industry can connect with over 300 research professionals in software, hardware, communications/networks, data analytics, control, UI/UX and trialling. The Applied IoT Cluster is open to all companies, of any size, nationally and internationally.

Similarly, the Engineering, Materials and Design Cluster brings together six Gateways based in Dublin, Waterford, Athlone, Galway, Sligo and Carlow and promotes them as a single entity to companies looking for technical solutions in the broad engineering and materials space. This cluster provides companies with access to over 300 industry researchers in areas such as precision engineering, biotechnology, polymers, protective coatings, prototype design, medical imaging technologies and 3D medal additive manufacturing. Both clusters also foster greater interaction and cooperation between the Gateways resulting in more collaborative projects between Gateways and a higher number of referrals between Gateways. All of which allows companies to maximize the benefits of working with the Technology Gateway Network.

(c) SFI has recently announced that it will invest €72 million over the next six years in four new SFI Research Centres. The Research Centres will be supported by 80 industry partners who will provide an additional €38 million to support cutting-edge

basic and applied research in the areas of digital and additive manufacturing, diagnosis and treatment of neurological disorders and the bio-based economy. SFI has a number of applications for new Spokes projects at various stages of review and anticipates making further significant investments through this programme in 2017.

[Four further SFI Research Centre proposals were approved in principle by the SFI Board following stringent assessment by international peer review. These proposed SFI Research Centres involve collaborative partnerships with over 100 companies who have committed €60 million funding to the centres.]

(d) A Business Plan to support the RTO concept, supported by **IDA**, EI, SFI and industry was submitted to DBEI for review in Q1 2015. The agencies and DBEI are currently discussing the proposal.

Enterprise Ireland is actively engaged with the IDA and with DBEI to further scale the existing Advanced Manufacturing supports provided through the Irish Manufacturing Research (IMR) and to secure additional funding for necessary capital investment in additive manufacturing equipment and pilot automation lines. The agencies will seek to ensure that IMR has the opportunity to work both with existing centres of manufacturing expertise and with the recently announced SFI centres Deantus and Confirm.

(e) Enterprise Ireland has robust economic impact type metrics with regards to Technology Gateways and Technology Centres including enterprise co-funding and movement of researchers into enterprise

Action No. 2.8	**Promote inter-disciplinary research**
Description	Research funders will review their programmes to ensure that they incentivise and reward interdisciplinary collaboration.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**Research funders**
Progress Update	**DAFM**'s most recent Research Call included a Conceptual Framework which continued to emphasise the need for a multi-actor approach and the use of consortia comprising a variety of scientific and other disciplines in order to ensure an integrated holistic research effort that adds value along the entire chain from farm to fork. **DCCAE** have indicated this is part of the EU SET Plan, which makes this a requirement for Member State programmes. The **EPA** primarily funds research projects following an open and competitive call and, where relevant, inter-disciplinarily research is encouraged. Reflecting its support of IDR - as part of its 2016/2017 research funding, the EPA is cofunding research with the Marine Institute, Met Éireann, DAFM, GSI and the HSE. In 2017, the EPA has reviewed and revised its Application Form including a requirement to demonstrate (where applicable) the inter-disciplinarity of the research. This will allow the EPA to provide an indicator for this Action.

The **HEA** supports interdisciplinary collaboration through its core grant model. This helps researchers across disciplines and across institutions to collaborate with each other by providing platform support for research activity across the full spectrum of disciplines and TRL levels.

Health research involves a very wide range of scientific, academic and clinical disciplines, from biology to mathematics, from chemistry to population studies, from physics to statistics, from psychology to engineering, and from management to computing. It includes academic researchers, healthcare professionals, the education sector, the life sciences industry, and numerous charitable groups. Therefore, the **HRB** strategic approach to research investment has a strong focus on developing, incentivising and supporting inter- and multi-disciplinary research. Through its funding schemes the **HRB** is supporting interdisciplinary research and the development and enhancement of capacity in this area. For example:

- Ongoing support for the HRB Interdisciplinary Capacity Enhancement Awards (ICE) scheme for postdoctoral researchers in population health and health services research (commitment of almost €7M).
- Under the HRB Strategy 2016-2020 *Research Evidence Action*, the HRB will expand the ICE scheme (or develop a similar instrument) to include patient-oriented research and/or translational medicine.
- The SPHeRE PhD Programme places a strong emphasis on inter- and multi-disciplinarily in the training of future researchers in population health science and health services research.
- The HRB Collaborative Applied Research Grants (CARG) have a strong inter- and multi-disciplinarily focus (commitment of almost €4.8M).
- The HRB Applied Partnership Programme requires co-management of research projects by an academic and policy/health system PI to address research questions that are relevant and translatable in the policy/health system. Not only will this initiative ensure that research evidence can be translated into policy and clinical practice, but it creates opportunities for health and policy professionals to engage in research as part of their everyday work.

The **IRC** announced in Q2 2017 12 project awards under the New Horizons Interdisciplinary Research (IDR) programme with a total value of €2.5m. A draft outcomes report of the Creative Connections IDR Workshops programme is completed and planning is underway for new Call in 2017.

The recently completed Marine R&I strategy promotes Marine as a theme that spans verticals such as food, energy, transport, and current and future **MI** programmes will promote research that addresses multiple verticals where possible.

SEAI encourages and supports interdisciplinary research which is critically important to bringing forward energy solutions to a low-carbon economy. Many of these solutions will require a cross-disciplinary approach from, for example, science, engineering, social science and economics. In particular, SEAI's national RD&D programme highlights specific areas of priority for funding which requires multidisciplinary research.

SFI's partnerships programmes incentivise interdisciplinary collaboration. The SFI Investigator Programme 2016 partnered with Marine Institute, Teagasc, GSI, and the EPA to stimulate interdisciplinary research proposals. Under this call approximately 42 applications involve co-funding partners. The outcome of the call will be reached

in Q3 2017.

Teagasc hosts regular interdisciplinary workshops to encourage collaboration between the different disciplines in Teagasc. Research proposals arising from these workshops are then submitted to the Teagasc Internal Funding call. Teagasc was a co-funder on the SFI Investigators Programme 2016 (IvP 2016). To be eligible to apply under the Teagasc section of IvP 2016, proposals had to involve collaboration between scientists from the agriculture and food disciplines and scientists from other STEM disciplines.

Action No. 2.9 APJ 2017 No. 45	Promote entrepreneurship
Description	Progress the implementation of the actions in the *National Policy Statement on Entrepreneurship in Ireland.*
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	**DBEI,** DES, HEA
Progress Update	The 2016 Annual progress report for the *National Policy Statement on Entrepreneurship in Ireland* (NPSE) was completed in Q1 2017. 2017 sees the NPSE Mid Term Review take place which will include stakeholder meetings and feedback in order to assess and assist the direction on the 2nd half of the Policy Statement. It will also specifically focus on underrepresented cohorts of entrepreneurs. The **HEA** has supported DES in the OECD HEInnovate Review of entrepreneurship education in Irish higher education. The Review will be published shortly and will highlight good practice underway across the sector that has the potential to be mainstreamed. The Springboard 2017 Initiative operated by the HEA offers entrepreneurship upskilling courses across several locations. The HEA is also providing support in 2017 for entrepreneurship summer camps for second level students. The new HEA System Performance Framework 2017-2021 will include an entrepreneurship indicator.

Action No. 2.10	Access to finance
Description	Implement the 'Finance for Growth' actions in Enterprise 2025 to ensure the availability of a comprehensive and competitive range of financial services to meet the needs of innovative enterprises.
Status	Ongoing
Implementation Date	2016-2020
Lead Responsibility	**DBEI,** DPER, DOF, EI
Progress Update	The Credit Guarantee Scheme 2017 is now in place. The new scheme amends the previous scheme by increasing the level of risk that the State may take (up to 80% of individual loans), extending the scope to cover other financial product providers, and extending the definition of loan agreements to include other financial products. Performance under the Credit Guarantee Scheme (until end Q1 2017) shows that

437 facilities with €69.8m in lending have been sanctioned, supporting the creation of 1,732 new jobs and 1,098 jobs being sustained. A Counter Guarantee Scheme will be in place shortly which will allow the Minister to share risk with the Strategic Banking Corporation of Ireland (SBCI) to enable SBCI to access and drawdown EU funding for Irish SMEs.

Microfinance Ireland recently published its latest Quarterly Report (Q1 2017) showing that since its inception Microfinance Ireland has approved 1,249 loans and provided €18.2m in loan approvals, which supported 2,948 jobs. There was a strong regional spread with loans granted in all 26 counties with 79% of the loans provided to microenterprises outside Dublin.

In relation to the Enterprise Ireland Seed and Venture Capital Scheme, the Department of Business, Enterprise & Innovation is commissioning an economic evaluation with the aim of determining if the intervention by the State in the Scheme has contributed to the required critical mass of activity in the wider Seed and Venture Capital market, and to ascertain what (if any) form the next stage of intervention should take. The Evaluation is expected to be completed in Q4 of 2017. A procurement exercise is currently underway.

The 'Supporting SMEs' online tool provides access to information on over 170 Government business supports across over 27 Departments, Agencies and initiatives.

Action No. 2.11 a	Increase collaboration within the public research system
Description	a. Research funders will review their programmes to ensure that they incentivise and reward collaboration between researchers, institutions and centres.
Status	**Ongoing**
Implementation Date	2016 – 2020
Lead Responsibility	a. Implementation Group
Progress Update	**DAFM**'s most recent Call (in line with previous Calls) strongly encouraged applications with inter-institutional collaboration and contained an explicit requirement that applications in the budget range €600,000 to €3m must comprise a minimum of between 2 and 4 RPOs on a sliding scale with each accounting for at least 10% of the grant requested. A similar requirement will set out in any new Calls planned.

EI Innovation Partnerships, Technology Centres and Technology Gateways specifically target collaboration between industry and third level institutes.

The **EPA** primarily funds research projects following an open and competitive call and, where relevant, collaboration between researchers, institutions and centres is encouraged. This is the case for Medium-Scale and Large-Scale projects funded by the EPA. Such collaboration is reviewed during the 2nd step of the Evaluation Process (National Overview) under the *Capacity Development of Irish research community* criteria. During the reporting period, 58% of the Medium- and Large-Scale projects awarded in 2016 are collaborative projects across several organisations.

The **HEA** supports collaboration through its core grant model. This helps researchers across institutions and their respective centres to collaborate with each other by |

providing platform support for research activity across the full spectrum of research disciplines and TRL levels. Collaboration underpins the System Performance framework and the HEA's Strategic Dialogue process. All HEIs are part of regional initiatives and compact agreements contain joint objectives and associated KPIs for region-based collaboration.

The **HRB** has a long history of collaboration with other agencies and organisations within the health research system, where this enhances and adds value to their strategic objectives. In its Strategy 2016-2020 *Research Evidence Action* the HRB has reiterated its commitment to engage with other funding partners both nationally and internationally and in the coming years will pay particular attention to developing new and innovative partnerships and collaborations in areas such as patient safety and quality, chronic disease management, quality improvement, health and wellbeing, data infrastructure and evidence synthesis and guideline development. HRB continues to sustain existing and develop new co-funding initiatives where appropriate. Recent examples include:

- A joint funding programme with the HSE to support research collaborations in quality and patient safety which now supports seven projects in priority topics for the HSE.
- Funding for the Ireland-NI-US partnership and for the SFI-HRB-Wellcome Trust Biomedical Research collaboration.
- A joint-funding initiative on dementia with Atlantic Philanthropies.
- A joint funding initiative with the Fulbright Foundation to encourage health professionals and health policy practitioners to avail of travel bursaries to relevant US institutions.
- The joint-funding initiative with Irish Medical Research Charities (MRCG Co-fund Scheme) is currently in its 8th round, having funded 95 projects with up the €300,000 each previously. In 2016 this scheme was reviewed to facilitate the participation of smaller charities and 13 additional awards were made. The HRB also provided core funding to the MRCG to provide strategic coordination among medical charities in Ireland.
- The Applied Research Partnership programme links academic and clinical researchers with decision makers/ health managers/ practitioners/ NGOs and the business sector by requiring a co-funding element with policy and practice partners.
- A critical mass of clinical researchers in five specific thematic areas has been brought together in HRB Clinical Trial Networks to foster collaborative multi-site clinical trials. HRB-Clinical Research Coordination Ireland coordinates the clinical research infrastructure in Ireland for the purpose of facilitating multi-site clinical trials.
- The HRB-Trials Methodology Research Network brings together Irish and international higher education institutes and methodology centres. The HRB-TMRN database of clinical trials expertise provides access to 130 experts.
- The SPHeRE Network trains PhD students in health services and population health research, bringing together all Irish universities and RCSI.

IDA continues to market Irish researchers to both existing and new name target clients, nationally and internationally and encourages collaborations. IDA in principle will provide a higher percentage grant to companies who engage the academic community in strategic projects as part of their larger in house RD&I proposals. IDA have supported a number of Innovation Partnerships between IDA clients and the Irish academic research community.

The **IRC**'s New Horizons scheme rewards interdisciplinary collaboration between STEM and HSS. 12 awards (total value €2.5m) announced in Q2.Draft outcomes report of Creative Connections 2016 IDR Workshops programme completed and planning underway for new Workshops Call in 2017.

MI is currently engaged in Co-Funding with SFI, EPA and is actively in collaboration with other state agencies such as SEAI, & Met Eireann. The recently completed marine R&I strategy rates collaboration as a key indicator of maturity, and as such is an integral factor driving research investment.

SEAI encourages and supports collaboration between researchers, institutions and/ or centres in energy-related research. In particular, this is promoted through its national RD&D programme which includes a collaborative aspect in the proposed project scope. SEAI also co-funds research with other agencies, specifically Geological Survey of Ireland through the IRC Society and Policy Call.

SFI's programmes incentivise and reward collaboration. These programmes include Research Centres, Investigators Programme, Spokes, and Strategic Partnerships. In particular, SFI Research Centres are multi-institutional and multi-researcher collaborations. SFI's Investigator Programme 2016 partnered with MI, Teagasc, GSI, and the EPA to stimulate interdisciplinary research proposals. Under this call approximately 42 applications involve co-funding partners. The outcome of the call will be reached in Q3 2017.

All **Teagasc** competitive funding requires collaboration between researchers, institutions and centres. The Walsh Fellowship Programme requires co-supervision of students between a University supervisor and a Teagasc supervisor. The Teagasc co-funded part of IvP 2016 required a collaboration between a Teagasc staff member and a non-Teagasc staff member (i.e., from another SFI-eligible institution). The ERA-NETs which are funded by Teagasc and DAFM (e.g., SusAn and ERA-GAS) require at least two Irish research performing organisations to be involved in the application. Teagasc has funded two clusters of Walsh Fellowship PhD studentships to align and support the work of the APC and the DPTC.

Action No. 2.12 APJ 2017 No. 88	Increase collaboration between firms and the public research system
Description	a. Establish new enterprise liaison positions to promote collaboration between the enterprise sector and the public research system. b. Expand the SFI Strategic Partnership and SFI Centres Spokes programme for adding new industrial and academic partners to the SFI Research Centres. c. Increase the use of the EI Innovation Partnership scheme to drive market-

	led collaboration between firms and the public research system.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	EI/Knowledge Transfer Ireland SFI, HEIs
Progress Update	**a.** The **KTI** strategic plan was presented to EI's Executive in May. This will progress to EI Board for approval in June. **b. SFI** continues to make progress with the Strategic Partnership Programme, with a total investment to date of €28m in 13 unique partnerships which have leveraged €21m from industry and philanthropic organisations. A notable achievement of the programme in 2016 is the joint funding of a new Fraunhofer Project Centre at DCU which will focus on contract and collaborative research as well as technology development projects addressing cost-efficient design, development and manufacture of microfluidic "lab-on-a-chip" technologies in support of the MedTech industry. This Centre represents the first Fraunhofer Centre in Ireland. SFI has a number of applications for new Spokes projects at various stages of review and anticipates making further significant investments through this programme in 2017. **c. Enterprise Ireland** will continue to actively promote the Innovation Partnership Programme by way of including it in presentations to external audiences, stands at events etc. in order to increase market-led collaboration between firms and the public research system and annual targets will continue to be set for this programme to help achieve this. In other industry/public collaborations, marine renewable energy is a priority area under RP and SEAI supports this sector through an Ocean Energy Prototype Development Fund. This fund stimulates the development and deployment of ocean energy devices and systems, with an emphasis on industry-led projects.

Education for Innovation

Action No. 3.1 APJ 2017 No. 77	**Strengthen STEM teaching and learning at primary and post-primary levels**
Description	Provide students with a wide range of STEM and related skills, supported by a programme of continuing professional development for science teachers at first and second level
Status	**Initiated**
Implementation Date	2016 – 2020
Lead Responsibility	**DES**
Progress Update	Increasing subject choice is important for student motivation and engagement and for ensuring curriculum development continues to respond to the changing needs of learners, society and the economy. **DES** is developing new specifications for a range of subjects in order to enhance competencies developed and assessed including in STEM subjects, and to increase student take-up of these critical subjects. The National Council for Curriculum and Assessment (NCCA) are in the process of developing a new primary Mathematics curriculum. The NCCA is due to commence consultation on the new primary maths curriculum, including computational thinking, creative thinking skills and coding by the end of 2017. Three new Leaving Certificate specifications for Biology, Chemistry, and Physics have been approved on a provisional basis pending the implementation of a trial of the assessment arrangements outlined in the specifications. The trial will take place later in 2017. Another significant development will be the work on developing a subject specification for Leaving Certificate computer science which will help to harness and develop student interest in this strategically important discipline. In accordance with the Action Plan for Education 2017, the NCCA is developing a Leaving Certificate Computer Science draft subject specification, for completion in 2017. Work is also underway on the preparation of a STEM Education Policy Statement and implementation plan. The STEM Education policy statement and implementation plan is due to be produced in Q2 2017.

Action No. 3.2 APJ 2017 No. 77	**Further scale initiatives to encourage young people and the wider population to participate in STEM disciplines and engage the broader Irish public in STEM.**
Description	a. Increase support for the Smart Futures and SFI Discover programmes and build on success of initiatives including Student Enterprise Awards, CoderDojo, Science Week Ireland, BT Young Scientist. b. Increase Irish public awareness of STEM from 49% to 60% of the population (350,000 additional people) c. Increase the level of uptake of STEM subjects at second level by 2020
Status	**Initiated**

Implementation Date	2016 – 2020 Q4 2016
Lead Responsibility	**SFI,** DES, HEA, with other funders, stakeholders and co-sponsors
Progress Update	**a.** Under the **SFI** Discover programme a total of €2.8m was awarded across 44 projects to support projects engaging the Irish public with STEM. Under the Smart Futures programme (academic year 2015/16) 215 school visits were delivered (2/3 of which were to girl's or mixed schools) and over 80 career events were attended. These actions combined to deliver direct engagement with over 29,000 students. Additionally, cinema and TV advertising took place which increased traffic to the Smart Futures.ie website. As part of the ICT Skills Initiative announced in March 2017, the **HEA** will support additional summer computing camps for second level students; an additional €0.25m has been ringfenced by the Minister for this, making places available to approximately 2,000 students. The HEA will also again support College Awareness Week (to run in November 2017) to encourage young people to consider the benefits of going onto third level, including what STEM courses have to offer. The **HRB** sponsors an award for a health-relevant project in the BT Young scientist exhibit The **EPA** has developed several education resources, including games and teaching resource packs. The materials are being used by teachers at primary and second level to teach specific areas of the curriculum and raise environmental awareness generally. During the reporting period: o The EPA encouraged staff to visit schools presenting on the work of the EPA, and current information on their local environment. o The EPA regularly hosted stands at environmental conferences; educational events and workplace environmental awareness days. o The EPA worked with *Junior Achievement Ireland* to deliver their programme to schools in Wexford and Castlebar. o The EPA has provided funding to a variety of radio and TV programmes featuring issues of environmental interest including *Eco Eye*; *The Investigators* and *Science Squad.* o The EPA has sponsored several initiatives including the Eco UNESCO Young Environmentalist Awards and The BT Young Scientist Awards. o The EPA launched its 2016 State of the Environment, with a number of State of Environment products to accompany the report. o The EPA's Catchments.ie, developed in collaboration with DHPCLG and local government won two Web Awards – Best Science and Technology & Most Innovative Website as well as the Excellence in Innovation Award (2016 Civil Service Excellence and Innovation Awards). o In 2017, the EPA launched a competition targeted at secondary school-pupils to tell - The Story of Your Stuff. Students were invited to choose an everyday object such as a pen, mobile phone or a water bottle and use a visual medium to illustrate its lifecycle. o The EPA funded the production of a high quality communication book on the soils of Ireland, combining, collating and updating existing knowledge on Irish soils. This book aims at reaching beyond the scientific research community to those at secondary level or even those with an interest in soils. **b.** Highlighted outputs include growth of Science Week audiences through the support of new festivals in Cavan/Monaghan and Kerry plus a refocus of existing

activity to new communities, **SFI** Awards of Science and Maths Excellence with 546 primary schools participating (additionally, evaluation of the SFI Discover Primary Science and Maths CPD for teachers indicates a significant increase in the teacher confidence in teaching science), and an SFI joint initiative with RTÉ producing three documentaries and the week long daily show, Big Week on the Farm which reached an average audience of over 330k per day. The SFI research community also delivered over 950 engagement activities in 2016 reaching the public, children and policymakers.

c. Students sitting Chemistry, Physics and Maths (hons) has increased over the lifetime of the Smart Futures strategy. STEM CAO applications have seen minimal changes overall, with some course categories (e.g. "Science/Applied Sc") seeing slight increases, others (e.g. "Engineering/Tech") experiencing slight decreases.

Action No. 3.3 APJ 2017 No. 68	**Launch new apprenticeships and traineeships**
Description	Launch, in partnership with industry, a range of new apprenticeships and traineeships to meet the needs of Ireland's most innovation-intensive sectors
Status	**Initiated**
Implementation Date	2016 – 2020
Lead Responsibility	**DES, SOLAS, Skillnets with industry**
Progress Update	The "Action Plan to Expand Apprenticeship and Traineeship in Ireland 2016-2020" aims to establish work-based learning as a core contributor to Ireland's growth as a society and economy. The Plan includes a target of 50,000 apprenticeship and traineeship places to be provided over the period 2016-2020 including a target of 9,000 new and existing registrations by 2020. In 2016 the first of the new apprenticeship programmes developed by the Apprenticeship Council got underway with the Insurance Practitioner Apprenticeship commencing in September and the Industrial Electrical Engineer Apprenticeship getting underway in November. Three further new apprenticeships have recently commenced, two in the medical devices area and a polymer processing apprenticeship. Subject to successful validation, a further 10 new apprenticeships will get underway later this year in various sectors including hospitality, financial services and accounting. A new call for apprenticeship proposals was issued on 4th May to refresh the pipeline of proposals established through the Apprenticeship Council's first call in 2015. The call will remain open until 1st September.

Action No. 3.4 APJ 2017 No. 90	**Ensure that world-class standards apply to the quality of postgraduate researcher education and training**
Description	Advance and ensure quality postgraduate research education provision in Ireland through the implementation of the National Framework for Doctoral Education

	incorporating modules on entrepreneurship, IP management etc.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	HEA & QQI with HEIs
Progress Update	The National Framework for Doctoral Education sets out key principles for doctoral education in Ireland and has been signed up to by all institutions and main research funding agencies. QQI is currently completing a Code of Practice for research degree provision that will support the implementation of the Framework. The HEA and QQI are also engaged in dialogue with the working group who developed the Framework on the establishment of an Advisory Forum: its membership, Terms of Reference and format.

Action No. 3.5 APJ 2017 No. 88	**Increase enrolment of postgraduate researchers to address demand in the economy**
Description	Increase research masters and Ph.D. enrolments from 1,750 in 2015 to 2,250 in disciplines aligned to enterprise and other national needs**.**
Status	**Ongoing**
Implementation Date	2020
Lead Responsibility	**IRC, SFI, other funding agencies as appropriate**
Progress Update	The **IRC** have proposed an increase in PG scholarships in the mid-term Capital Review, delivering an increase will depend on funding uplift.
	No funding has been provided to date in the **DES** Estimates process to allow this Action to be implemented. DES has sought funding in the mid-term Capital Review to enable these increases to be delivered.
	SFI's existing programmes (such as Research Centres, discussed elsewhere), continue to fund research Masters and PhD enrolments.
	During the reporting period over 100-full time researchers were working on **EPA**-funded research projects. As part of the EPA-IRC Scholarship scheme, 6 Scholarships were funded in 2016 and 2 are due to be awarded in 2017. The EPA will continue its Strategic Partnership with the IRC for their 2017/18 Call. As part of the DIT Fiosraigh Enterprise Scheme, 1 PhD was cofunded between EPA & DIT in 2016 and one PhD is to be advertised in 2017.
	In addition to the 300+ post-graduate and doctoral researchers supported through **HRB** projects and programmes, and fellowships annually, the HRB supports two significant PhD Scholars Programmes: ○ The SPHeRE PhD Programme trains post-graduate students in population health science and health services research (commitment of over €25M). An independent review of the SPHeRE programme in 2016 confirmed the quality and importance of this initiative for capacity building in these important areas for the health sector, and a sustainability plan is currently being developed in

	collaboration with the programme directors.
	o In 2016, the Wellcome Trust/Health Research Board Irish Clinical Academic Training Programme (ICAT), worth over €9M was approved. This programme is uniquely based on cooperation between universities, postgraduate clinical training bodies and the HSE, to develop and implement a high-quality, all-Ireland, structured training for outstanding clinician scientists.

Action No. 3.6 APJ Nos 88 & 90 ACTION PLAN for JOBS	Address gaps in the funding system for post-doctoral researchers through competitive support for excellent research across all disciplines and with a particular focus on inter-disciplinary research.
Description	Deliver a 30% increase in the number of funded post-doctoral places in order to support the generation of future research talent and to maximise the take-up by industry of qualified researchers from the HE sector
Status	**Ongoing**
Implementation Date	2020
Lead Responsibility	**SFI, IRC, Other Research Funders**
Progress Update	**SFI**'s significant 2017 investment in 4 new world-class SFI Research Centres will result in the creation of many post-doctoral positions, with interdisciplinary research a focus of these centres. Additionally, SFI and the EPSRC in the UK have partnered to launch a new joint funding programme which will support and create post-doctoral positions. The increase in PhD Fellowships proposed by the **IRC** will depend on funding uplift. The IRC have completed the first Call under its MSCA COFUND 'Caroline', resulting in 19 new postdoc Fellowship awards (combined value €4.2m). A total of 50 awards will be made in all over the lifetime of the programme. Interdisciplinarity, 'intersectorality' and mobility are the three core principles of MSCA. Under its Strategy 2016-2020 *Research Evidence Action*, the **HRB** worked with higher education institutions and the health system to launch an Emerging Investigator Scheme to enable mid-career researchers to advance to senior investigator level and become independent researchers in a multidisciplinary and cross-sectoral environment. Applications for the first round of this scheme are currently being peer reviewed.

Action No. 3.7b	Ensure continued opportunities for researcher career development in areas of strategic importance
Description	b. Develop metrics for scoring applicants who have successful industry linkages but lower numbers of publications/ citations than candidates with a purely academic track record.
Status	**Initiated**
Implementation	b. 2017
Lead Responsibility	**b. DES, HEIs, HEA**
Progress Update	The Irish Universities Association has developed a draft researcher careers framework which is being discussed with DES and HEA.

Action No 3.8 APJ 2017 No. 88	**Institute a new programme of funding for frontier research across all disciplines**
Description	Establish a new competitive fund to enable the next generation of researchers transition to Principal Investigator status and enable the research community in Ireland to be competitive internationally.
Status	**Complete**
Implementation Date	**2017**
Lead Responsibility	IRC
Progress Update	Call launched in early Q2 for Starting and Consolidator Laureate Awards, with closing date for applications of 29 June 2017. Programme is open to exceptional researchers anywhere in the world (hosted by an Irish RPO). The IRC will make a minimum of 24 awards valued between 400k and 600k, reflecting a total commitment of €12m for the first iteration.

Action No. 3.10	**Develop a coherent national policy on structured progression for researchers**
European Research Area	
Description	Identify and tackle impediments to career progression and mobility of trained researchers and innovators in the publicly funded research system by developing a coherent national policy on structured progression for researchers
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**DES with DBEI and relevant stakeholders**
Progress Update	Human capital is a critical factor in reaping economic and social rewards from investment in research. However, a comprehensive and coherent framework for researcher careers is needed to bring greater clarity and certainty to the career structure and to provide researchers with developmental opportunities to enhance their skills and employability, both with academia and the wider economy. The IUA has developed a draft framework to address these issues and has discussing these proposals with policy makers and funders. The IUA will present the Framework to the Interdepartmental Committee by Q3 2017. The successful implementation of a national framework requires that all stakeholders are aligned with the overall policy, and that the policies, processes, practices and budgetary decisions of stakeholders support the central policy objective of optimising the impact of the human capital developed in our research system.

Action No. 3.11 APJ 2017 No. 88	**Ensure career support for Ph.D.s and post docs**

Description	Provide detailed advice, mentoring, internships and placements to ensure that the full spectrum of career possibilities – industry, academia, public service – is known from an early stage.
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	HEA, IRC, SFI and all research funders
Progress Update	All institutions provide careers advice to early-stage researchers and this is evolving as new opportunities emerge, for example, the launch of the Irish Research Council's Laureate Awards. The **IRC** announced outcome of key partnership-based funding programmes in Q2 2017 which provide opportunities for early-career researchers, under the supervision of a principal investigator (awardee) to gain exposure to other working environments. Programme outcomes announced include Research for Policy and Society (21 awards, total value of awards €1.9m) and New Foundations (Engaging Civic Society strand, 28 awards). The IRC's suite of enterprise programmes provides opportunities for early-career researchers to develop a track record in working environments outside academia. IRC have completed the 2017 Employment-based programme Call, resulting in 30 pending awards. The EPS 2017 Call is currently open for applications (closing 8 June). Researchers' career development forms part of the work underway at the Higher Education Research Group (HERG) that is chaired by **DES**. The IUA is currently developing proposals on this issue on which the **HEA** is engaging via HERG. In the addition, the IRC will be producing a policy statement on researcher career development with respect to its funded researchers. The **DAFM** partnership with the IRC's employment based Research Programme has helped facilitate the placement of 5 M.Sc and 9 PhD placements in agri-food, forestry, fisheries and bioeconomy enterprises. DAFM has agreed to continue to partner with IRC in the 2017 employment based Research programme and is awaiting the outcome of the Call. DAFM funded Agri-Food Graduate Development Programme continues to ensure career support for PhDs and post docs through its academia / industry developed modules. **Teagasc** has developed and implements a Post-Doctoral Development Programme (TPDP) which provides professional development to post-doc researchers in Teagasc. It is aimed at developing the performance of postdoc researchers while in Teagasc, but also preparing them for the variety of career options ahead. Participants have access to development opportunities that will equip them with the necessary skills for the next stage of their career whether in academia or industry. Walsh Fellowship students also have access to the training provided under this programme and planning is currently underway to develop a specific training programme for Walsh Fellows (PhD level).

Action No. 3.12	**Ensure the mobility of researchers between academia and industry**

APJ 2017 No. 88, 90	
Description	a. Enhance existing support for the bilateral flow of researchers between academia and industry by increasing awards including under the SFI Industry Fellowship Programme, the IRC Employment-based Postgraduate Programme and the IRC Enterprise Partnership Programme b. Increase the share of PhD researchers transferring from SFI research teams to industry from 25% in 2014 to 35% by 2020 c. Establish improved system-wide tracking of researcher mobility into industry d. Continue support for the EURAXESS Ireland Office
Status	**Ongoing**
Implementation Date	a. 2016-2020 b. 2020 c. 2017 d. 2016-2020
Lead Responsibility	a. SFI, IRC, other funders b. SFI c. HEA, research funders d. DBEI, IUA
Progress Update	**a.** The number of applications to the **SFI** Industry Fellowship programme in 2016 showed a 28% increase compared to 2015. In 2016, 39 fellowships were funded to a total value of €2.9m. The Industry Fellowship 2017 call has been launched. **IRC** has completed the Call process for the 2017 Employment Based Programme (resulting in 30 awards) and the Enterprise Partnership 2017 Call is currently open. **b.** The number of PhD researchers transferring from **SFI** research teams to industry increased to 27% in 2016 from 24% in 2015. Training of PhD researchers in the four new SFI Research Centres (co-funded by industry) will result in graduates with skills relevant to emerging, strategically important enterprise areas. **c. IRC** is enhancing researcher profile functions within its SmartSimple awardee management system. Ultimately, this will facilitate researchers to continue to update their profile, publications, career progression etc. so as to allow for career tracking over the long-term. **Teagasc** is currently undertaking an exercise to track the employment of Walsh Fellows who graduated over the past five years. **d. DBEI** continues to support the EURAXESS Ireland Office which is hosted by the IUA and facilitates researcher mobility. In 2016 EURAXESS Ireland processed 373 hosting agreements and 146 agreements were extended. The hosting agreements covered researchers from 49 different non-EEA countries.

Action No. 3.13 APJ 2017 No. 48	**Enhance innovation and entrepreneurship related skills**

Description	Establish a new initiative to encourage a culture change and enable the structured progression of early-career stage researchers to careers in entrepreneurship.
Status	**Complete, with ongoing projects**
Implementation Date	2017
Lead Responsibility	SFI, EI
Progress Update	In March 2017, **SFI** announced its I-Corps@SFI partnership with the National Science Foundation (NSF) Innovation Corps (I-Corps) making it the first European funding agency to establish such a partnership. Under this partnership, SFI funded researchers can undertake evidence-based entrepreneurship and customer discovery training as part of the NSF I-Corps Curriculum. The NSF I-Corps Curriculum is an immersive team-based training programme based on the Lean Startup methodology. Following an Expression of Interest stage, SFI invited 12 full proposal applications by the 16th December 2016 deadline. These applications were then reviewed by a panel of independent international experts. Following international peer review of proposals, SFI offered awards to all 12 teams. Following offer, 10 teams progressed to accept awards and undertake training. Five teams will have completed the training component of the programme by May 2017. TIDA is the Technology Innovation and Development Award programme through which SFI supports researchers, including specific opportunities for early career researchers, to realise new and emerging opportunities for innovative ideas and to encourage researchers to pursue those opportunities by considering entrepreneurship as an alternative career path. SFI launched the TIDA 2017 call in March with a deadline at the end of May 2017. As part of the TIDA programme, funding is provided for researchers to participate in entrepreneurship training. SFI has recently revised and improved the offering that will be available through this training course. The **DAFM** funded Agri-Food Graduate Development Programme is used as a platform to develop a model to deliver continuous professional development for graduates in research and companies through short themed modular courses and work placed Masters and PhD programmes.

Action No. 3.14	**Address barriers to pension portability that can restrict researcher mobility**
European Research Area	
Description	Explore possibility of higher education institution and other RPO participation in the EU RESAVER pension scheme
Status	**Delayed**
Implementation	2016
Lead Responsibility	DES, HEA, HEIs, RPOs

Progress Update	The IUA Pensions Group has undertaken initial examinations of the EU Resaver scheme and the potential for its introduction in Ireland. DES has met with representatives of the group and explored the issues involved. Further meetings between the Department and the Group in 2017 will continue these discussions. The introduction of the Scheme would require an exemption from the State single pension scheme.

Action No. 3.15	Address gender issues relating to career progression in research and innovation
Description	Engage fully with the Athena Swan initiative. Implement the relevant recommendations emerging from the HEA National Review of Gender Equality in Irish Higher Education
Status	**Ongoing**
Implementation Date	2016 - 2020
Lead Responsibility	DES, HEA, funding agencies
Progress Update	Following the three-year pilot that started in 2014, the **HEA** is now engaging with the UK Equality Challenge Unit to look at the continued extension of the Athena Swan Charter to Irish higher education. To support the implementation of the National Review of Gender Equality, research funding agencies will require HEIs to have attained a Bronze Athena Swan award within three years to be eligible for funding. Within seven years a silver award will be required. Implementation of the Reviews' recommendations is also now coming into the HEA's annual Strategic Dialogue process with the institutions and the enhanced governance arrangements in place within the institutions.
	The **IRC** have agreed and announced a joint position with SFI and HRB in relation to linking eligibility for research funding to AS accreditation, as is recommended in the National Review of Gender Equality. The IRC published in Q1 an update on its Gender activities and actions, to include details of the implementation status of recommendations arising from the Gender review. IRC have also committed €600k co-funding to the new Gender-Net Plus Eranet COFUND, a multi-country initiative partnering with the European Commission.
	SFI have indicated that the fraction of female award holders has increased from 21% in 2015 to 25% in 2016, with 35% female team members in 2016.
	Teagasc has included the development of a gender strategy as a key action in its new HR strategy. Teagasc aims to join the Athena Swan Irish Initiative when it becomes available to Irish research institutes. Teagasc is participating in a Horizon 2020 consortium application, under the call 'support to research organisations to implement gender equality plans' (SwafS-03-2017) to address the issue of gender equality in organisations (RPOs and RFOs).
	The **EPA** introduced changes in its research application form and funding rules to include, for example, eligibility of maternity/paternity/adoptive leave to promote gender equality in researcher careers. In line with other national funding agencies, HEIs will be required to have secured the minimum Athena SWAN accreditation by

end 2019 in order to be eligible to compete for EPA research funding. By end 2023, the institutions will be required to hold the intermediate (silver) level accreditation to be eligible for competitive research funding. The EPA is developing and collating disaggregated data relating to gender, which will allow for better reporting/monitoring. In addition, EPA Research will develop its Gender Equality strategy by end of 2017.

The **HRB** recognises that making full use of the potential of both women and men maximises the quantity and, more importantly, the quality of research. Designing sex and gender analysis into research and innovation is seen by the HRB as a crucial component of health research. The HRB has undertaken a number of activities in 2016 and 2017 in the area of gender, including:
- Participated in the HEA Expert Group that undertook a review of gender equality in higher education
- Undertook a review of gender balance within HRB funding practices between 2013 and 2015 included assessment of male and female application and success rates, and the gender balance on panels.
- Prepared a new HRB gender policy and a plan for its implementation that aims to mainstream gender equality in HRB funding programmes and practices.

Action No. 3.16a APJ 2017 No. 90	Ensure a strategic approach to the development of existing and new research infrastructure programmes
Description	a. Scope out and develop a successor to PRTLI to support new investment in research infrastructure in the wider research base and to allow for maintenance and upgrading of existing facilities and equipment.
Status	**Ongoing**
Implementation Date	a. 2016
Lead Responsibility	a. DBEI, DES, SFI, HEA with other departments and funders, HEIs, enterprise agencies and other stakeholders
Progress Update	Initial scoping work was undertaken by DBEI in 2016. An outline programme proposal was presented by Minister Mitchell O'Connor to the Cabinet Committee on the Economy Trade and Jobs on 6th October 2016 (this was also presented to the I2020 Implementation Group). Work is ongoing in exploring the financing options for Cycle 6.

Action No. 3.16b APJ 2017 No. 90	Ensure a strategic approach to the development of existing and new research infrastructure programmes
Description	b. Review and optimise roll out of policies for accessing research infrastructure including policies to maximise enterprise use of, and partnerships in, research infrastructure.
Status	**Ongoing**

Implementation Date	b. 2016 -2020
Lead Responsibility	b. HEA, HEIs, Research Funders
Progress Update	To optimise infrastructure access (and related policies), the **HEA** is engaging a service provider to upgrade the LIRE database to a managed online system to which institutions will have access. Institutions will be required to regularly update the database and confirm (on an annual basis through governance statements) that the system is updated regularly. The **EPA** has awarded a research project aiming at developing an interactive database of Water RDI Infrastructure in Ireland. The outputs of the project will identify the gaps/needs in that area for further investment. In addition, the EPA has engaged in the discussion led by the HEA in relation to their new strategy. Lack/deficit in research infrastructure was identified by the EPA as one of the main barriers. The **HRB** has benefited over the years from PRTLI infrastructure in the health and biomedical sphere, and plans to work with other agencies to ensure that any future investment in this area adds value to existing clinical research infrastructure in Ireland. The HRB-Clinical Research Coordination Ireland (HRB-CRCI) was established to provide a signposting service for enterprise, both national and international, wishing to engage with Irish clinical research facilities and centres, and to conduct clinical trials arms in Ireland.

Innovation for Social Progress and the Economy

Action No. 4.1a	Address public policy needs and optimal use of research
European Research Area	
Description	Government departments will: **a.** Ensure that they are making best use of scientific evidence in the execution of their mission and address gaps where they arise.
Status	**Ongoing**
Implementation Date	a. 2016-2020
Lead Responsibility	All Government departments

Progress Update	**DAFM**'s 2016-2019 Statement of Strategy includes a formal undertaking (Action 3.5.1) to support, coordinate and align research, education and innovation activities in respect of plants, animals, food, forestry and the marine to progress DAFM's strategic objectives– DAFM's Research Funding Programme's help, inter alia, to operationalise this high level Department commitment.
	
	DCCAE published the Energy Research Strategy, the development of which was underpinned by scientific evidence.
	
	The **Department of Health (DoH)** established a dedicated Evidence Generation and Knowledge Dissemination unit within the **HRB** in 2010 to provide it with the best international evidence to inform its policy, regulatory and legislative functions. The specific functions of the HRB Evidence Unit are:
	    ○ To work with the DoH to identify upcoming policy/regulatory/legislative activities and define the research evidence needs for each
	    ○ To provide the DoH with peer-reviewed evidence synthesis reports, rapid reviews, national survey commissions and so on, as appropriate to their research evidence needs
	In addition, previous strategies for health system development in Ireland have recognised that appropriate high-performing healthcare delivery can only be planned, supported and evaluated through the effective use of information. To this end, the DoH supports five National Health Information Systems, which are run by the HRB in the areas of drugs and alcohol, psychiatric services and service delivery and uptake for intellectual, sensory and physical disabilities. DoH investment in research projects, programmes and centres, through the HRB, are providing the evidence in:
	    ○ Health Services Research to improve the uptake of healthcare innovations in the system, and is providing evidence about the quality, cost and implementation of healthcare interventions in the health system
	    ○ Population Health Sciences Research to enhance our understanding of the needs, behaviours and lifestyle of specific populations groups (e.g. older people, people with disabilities)
	    ○ Clinical research to develop more effective preventative strategies, better care practices and treatments and more sensitive models of care.
	
	The Strategic Policy Division (SPD) of **DBEI** is focused on evaluating, designing and executing ambitious enterprise and jobs strategies. SPD provides evidence-based

support to the work of DBEI as an advocate for enterprise and works across government to enhance the business environment for job creation. The enterprise, innovation and science surveys activity of SPD provides a key element of the policy research capability of the Department. DBEI is committed to best practice in the production of Official Statistics as a signatory of in the Irish Statistical System Code of Practice (ISSCoP). Amongst the innovation relevant reports recently produced by SPD are *Economic and Enterprise Impacts from Public Investment in R&D in Ireland*, the *Research and Development Budget 2015-16* and forthcoming in the next few months are the *Review of Innovation Supports for Enterprise* and the *Refresh of Research Prioritisation.*

The **EPA** has further developed its Research Communication Strategy in order to better target its messages to its stakeholders, in particularly targeting policy-makers. The EPA has actively engaged with the relevant Departments in terms of informing the research priorities, disseminating the relevant key findings and its role of implementation/enforcement of policies. In addition, the EPA has awarded a 15-month research project looking at knowledge transfer.

SEAI's national RD&D programme has a strong focus on funding research to enhance and support evidenced-based policy formulation. There are frequent and on-going interactions between SEAI and policy-makers in D/CCAE who are given the opportunity to provide input into the development of the research questions according to national policy priorities. The output from SEAI research adds to the evidence base for robust policy development.

Action No. 4.2	**Ensure R&D expenditure is afforded a sufficiently high priority in Government department budgets**
Description	Make business case through annual Estimates process to secure funding and report to the Cabinet Committee (through 2020 Implementation Group) on increased investment levels to contribute to impact and the 2.5% target for investment.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	All Government departments
Progress Update	Since the publication of Innovation 2020 in 2015, direct Exchequer funding of R&D has increased from €736m in 2015 to an estimated €761m in 2016. However, growth in GNP means that public investment as a percentage of GNP has fallen over the same period. In 2015 that the R&D intensity rate has slipped back from 1.79% in 2014 to 1.62% in 2015. We will need to further increase public funding for R&D if we are to realise our ambitions in Innovation 2020 and meet our 2.5% target. To highlight the importance of increasing R&D spend, the Innovation 2020 Progress Report 2017 will be brought to Cabinet in advance of the Estimates 2018 process. **DAFM** sought and secured a small increase in its budget allocation for the operation of its competitive research funding programmes for 2017 during the Estimates process in late 2016.

DCCAE Business Case made for SEAI component of this. Liaison with DBEI and other relevant Departments/Agencies maintained.

DES has requested additional funding under the mid-term capital review to enable implementation of a number of Innovation 2020 Actions.

The **Department of Health** sought an increase for the HRB's revenue budget as part of the estimates for 2017. An additional €0.5m was secured for the HRB in this regard bringing its allocation for 2017 to €32.054m. In addition the HRB receives capital funding of approximately €10m.

Action No. 4.3	**Address global and national societal challenges**
Description	Explore potential for competitive funding mechanism aimed at stimulating solutions-driven collaborations; engage the civic community and enterprise in identifying the grand challenges.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	All Government departments and agencies
Progress Update	The **EPA** has carried out an extensive consultation to identify key research needs for inclusion in its 2017 Research Calls, which were informed by the latest 2016 EPA State of the Environment Report and latest policy developments. In May 2017, the EPA (in collaboration with the HSE) published a Tender on Priority Settings for Environmental & Health Research. **HRB** Strategy 2016-2020 *Research Evidence Action* pays particular attention to developing new and innovative partnerships and collaborations that can create new knowledge to address the major health challenges in society and have an impact on tomorrow's healthcare. ▪ The HRB launched a new Investigator Led Project (ILP) scheme to add to the knowledge base internationally, and focus on important, timely research questions to address major health challenges. ▪ The HRB-MRCG Co-fund scheme supports research areas prioritised by Irish medical charities as being of most importance to their members. The **IRC** has established a strategic partnership with The Wheel, the national representative body for civil society organisations in Ireland. Agreement has been reached between IRC and HRB to develop a joint statement/plan on developing research to address societal/grand challenges. The recently published 'National Strategy and Roadmap for Energy Research in Ireland' sets out an ambitious vision for world class energy-related research in Ireland. **SEAI** has a key role to play in delivering on this vision through promoting, coordinating and assisting research, development and demonstration of sustainable energy technologies.

Action No. 4.4	Strengthen public policy and societal impact
Description	Target supports to cultivate interdisciplinary research; increase the engagement of public entities and civic society in public policy and societal challenge-based research
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	IRC, HRB, (DAFM)
Progress Update	The **IRC** announced in Q2 2017 12 awards under New Horizons IDR programme with a combined value of €2.5m. A draft outcomes report of Creative Connections IDR Workshops programme is completed and planning is underway for new Workshops Call in 2017. The IRC announced 21 awards under the Research for Policy and Society Programme with a total value of €1.9m, in Q2 2017. The IRC are co-funding with HRB the PPI (Patient and Public Involvement) Ignite programme – 5 awards with a total value of €1.75m announced in Q2.

Below the table:

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HRB Strategy 2016-2020 *Research Evidence Action* contains the commitment to strengthen and develop PPI. The HRB is the first funding agency in Ireland to do so. In response, the HRB is putting together an implementation plan to support PPI within the HRB and in HRB-supported projects and programmes.To strengthen PPI within its awards, the HRB will establish PPI Panels to provide feedback on the PPI elements of relevant HRB awards. In 2016, the HRB appointed a coordinator for one year, to develop processes and guidelines for such panels, and to establish the platform and panels themselves.

The **DAFM** funded Agri-Food Graduate Development Programme includes modules that aim to enhance transferable interdisciplinary skills that help strengthen graduates engagement in public policy and societal challenge-based research.

Teagasc regularly provides support to government and policy makers in relation to many issues related to agriculture, food, agri-environment and rural development. Examples include support in development of Foodwise 2025 and support in relation to the reform of the CAP. Other recent examples are Teagasc inputs in relation to climate change, rural development and Brexit. In relation to climate change, the most recent contributions are a submission to the draft National Mitigation Plan published by DCCAE. Rural development is a very important issue in Ireland and for Teagasc. Recent examples of policy support include: Dr. Frank O'Mara and Dr. David Meredith appeared before the Oireachtas Joint Committee on Arts, Heritage, Regional, Rural and Gaeltacht Affairs (Nov 2016) to discuss the sustainability of rural communities, Dr. Meredith has been involved in provision of research in support of the development of an action plan for rural areas.

Teagasc, in support of industry stakeholders and Government, have undertaken research and analysis on the potential economic implications of Brexit for the Irish agriculture and food industries. These include:
- A conference co-organised with DAFM in advance of the UK referendum that looked at the possible implications of Brexit for Irish agri-food trade

- Results of analysis at the farm level on the potential impact of Brexit presented at the annual Teagasc Review and Outlook Conference (Nov 2016)
- Teagasc co-organised a session at the Agricultural Economics Society annual conference entitled "Brexit and Beyond" that was addressed by Mr Phil Hogan, EU Commissioner for Agriculture and Rural Development (Apr 2017)
- Teagasc economists have appeared before the Oireachtas Joint Committee on Agriculture, Food and the Marine in relation to the impact of Brexit on the agri-food industry (November 2016). Teagasc research underpinned much of this Committee's report on impact of Brexit on the Irish agri-food and fisheries sectors
- On an on-going basis Teagasc economists have made presentations on the Brexit issue to agri-food industry groups and are members of the DAFM Brexit Consultative Committee.

As clarity emerges regarding the nature of the UK exit from the EU and the nature of future trade relations between the UK and the EU Teagasc will undertake economic analysis of the impact of Brexit on Irish agriculture.

The **EPA** has supported a number of research projects promoting civic society engagements under its Research and Green Enterprise programmes, e.g.:
- Community involvement in water management in Co. Cork;
- Climate information portal for Ireland;
- Sustainable campus communities;
- Community reuse network which is an all-island network for community re-use, recycling and waste prevention organisations;
- Integrated catchment management;
- Developing the potential of community energy action groups towards transition to a low carbon society;
- Development of a roadmap for a national water stewardship plan for Ireland;
- Sustainable voluntary communities: supports for sustainable environmental, social and economic development;
- Values and sustainable consumption behaviour;
- Environmental policy integration - Innovation and change.

A recently awarded project under the EPA-HSE research initiative involves collaboration with policymakers, practitioners and communities and other stakeholders to explore the types and qualities of public spaces that can be used in the design and implementation of inclusive nature-based solutions to assist communities to attain maintain and restore health.

In 2016, EPA Research-funded projects launched activities using citizen Science or focus workshops. The EPA-funded CONSENSUS project used social science and collaborative research methods to explore innovative solutions for sustainable household consumption in Ireland. The EPA initiated a programme of collaborative research programme with the ESRI, which will be of direct benefit to policy, with five research projects:
- Identifying and estimating the environmental effects of selected fiscal instruments;
- Use of behavioural economics lab experiments to examine environmental influences on consumer behaviour;
- Behavioural and experimental tests of the long-term benefits of the Green Schools programme;
- Health and well-being effects of environmental emissions and amenities in Ireland;
- Environmental Market Failures – spatial and land use planning.

The EPA is on the management committee for COST Action CA15212: Citizen Science to promote creativity, scientific literacy, and innovation throughout Europe.

SEAI's national RD&D programme has a strong focus on funding research to enhance and support evidenced-based policy formulation. In particular, consumer decision making and behavioural economics is an important component of engaging citizens in the clean energy transition as set out in the Energy White Paper. This aspect of SEAI's R&D programme will be informed by the work of its dedicated Behavioural Economics Unit established in 2017 which will use behavioural insights to deliver energy efficiency programmes that are carefully tailored to help citizens and businesses avail of the advantages of clean energy – both in terms of energy efficiency and renewable energy. This will have a range of benefits for people in Ireland, including lower energy bills, warmer homes, improved energy security, and reductions in our greenhouse gas emissions.

Action No. 4.5 APJ 2017 No. 84, 87	**Support collaboration across sectors (public and private) to deliver social policy objective**
Description	Examine potential areas for collaboration across Government departments and agencies. Explore SBIR potential in relevant sectors including health.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**Research funding Government departments and agencies**
Progress Update	**Enterprise Ireland** continues to support collaboration across sectors with current and new initiatives, for example, the Small Business Innovation Research (SBIR) Initiative which is a cross-government process that allows public bodies to use public procurement to source R&D and innovative solutions to solve identified 'challenges'. This provides significant business opportunities for innovation focused companies. Through SBIR, the Public Sector is able to: 1) Identify innovative solutions by reaching out to organisations from different sectors including small and emerging businesses 2) Create new technical solutions through accelerated technology development, whilst risk is reduced through a phased development programme and 3) Provide applicants with a transparent, competitive and reliable source of early-stage funding. Through SBIR potential suppliers or companies can: 1) Compete for each demand driven project in a transparent manner 2) Demonstrate a route to market for their solution 3) Focus on specific identified needs, increasing the chance of exploitation as developments are 100% funded – it is not a government grant- 4) Retain the intellectual property generated from the project (with certain rights of use retained by the contracting department). The **EPA** has been co-funding environmental research in partnership with Fulbright, SFI, GSI, IRC, HSE, MI and DAFM. The EPA also participated in the Interdepartmental Consultative Committee on Antimicrobial Resistance (AMR) hosted by DOH and DAFM. Under its Green Enterprise programme, the EPA has funded in 2016 a number of projects in the area of resource efficiency involving for example

Community Reuse Network (CRN), Voice of Irish Concern for the Environment (VOICE), and The Rediscovery Centre.

The **IRC** Research for Policy and Society programme would provide opportunities for research into cross-Departmental topic areas; In addition, IRC are open to exploring potential for our enterprise-facing schemes to support SBIR projects.

Action No. 4.7	**Support national and European open access policies and principles**
Description	Integrate and support open access repositories, the national research classification system (see Chapter 7, Action 7.6), HEI research information systems, research funders' grant management systems, and expertise locator systems (such as KTI's *Find a Research Expert*).
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	HEA, KTI, SFI, HRB, DRI
Progress Update	The National Open Research Forum has been established, building on the earlier national approach to develop open access principles. It is being chaired by the HRB with secretariat support from DBEI and active engagement on the part of the **HEA**. Preliminary meetings have focused on European Open Science updates, the Forum's membership and Terms of Reference. Five working groups are now being established to advance key dimensions of the Irish Open Science agenda, including: ○ Vision for Ireland; ○ Revision of Open Access principles; ○ Development of Open Research Data principles; ○ Consideration of current capacities and capabilities in Ireland; ○ Examples of good practice. Regarding *Find a Research Expert*, **KTI** submitted a business case to EI IT for an expanded research expertise single-search system in January. **SFI** mandates that funded researchers make their publications openly available. To facilitate greater interoperability and integration of systems, SFI now mandates that applicants to all relevant Calls sign up to ORCID, which provides a persistent digital identifier for researchers, and supports automatic linkages between the researcher and their work. Additionally, SFI has obtained a unique funder ID through its registration with the CrossRef Funder Registry, allowing publication datasets to be linked up to funding datasets. SFI is a member of the National Open Research Forum and the National Research Classification System Working Group. The **HRB** is active in a number of initiatives under this action, for example: ○ The HRB has been active in the area of Open Access for a number of years and was the first Irish funding agency to develop a mandatory Open Access Policy. The HRB continues to jointly chair the National Open Access Forum. ○ In 2016 the National Open Access Forum agreed to expand its remit to include Open Data, and has sketched out a work program over the coming years. ○ The HRB has completed a tender for a Pilot Open Science Publishing Platform

for a period of 2 years, which will be launched with HRB researchers in mid-2017, and will allow them to work in a more open manner. The drive to open publishing using the *F1000* service is being led by the Wellcome Trust.

- The HRB organised 2 national information and training seminars on the FAIR principles for health researchers in 2016 and plans further activities in 2017.

A detailed data management plan is a mandatory component of all HRB awards, alighted with the FAIR principles.

DBEI is providing secretariat to the National Open Science Forum, previously the National Steering Committee on Open Access Policy. At the EU level DBEI participates in the recently formed European Research Area Working Group on Open Science and Ireland is represented on the European Open Policy Platform and a number of its subgroups.

All **EPA**-funded projects must comply with an Open Access and Open Data policy for all the outputs arising from the projects. Since 2005, the EPA has a public Archive of Environmental Research outputs: SAFER, which is a repository of the outputs from EPA-funded projects. The EPA also has a Catalogue of Expertise in Environmental Research. Current work involves streamlining these interfaces, increasing their reporting facility and Open Data aspect based on the information collated on the EPA Grant Application and Project Management System. The EPA has also started investigating the possibility to use OpenAire.

Action No. 4.8	Support a conducive environment for health research in Ireland
Description	Continue the development of a coordinated approach to research management in the health system.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**Department of Health**
Progress Update	The **Department of Health** has established a new Research and Development and Health Analytics Division within the Department. This is a key development which will support a more conducive environment for health research and information in the health sector. In particular, the Department has supported the HRB-funded investment in developing and enhancing the national clinical research infrastructure through Clinical Research Facilities, trials coordination and methodology and trials networks. Specific investments include: - All HRB-funded Clinical Research Facilities (located at St. James Dublin, UCH Galway and UCH Cork in collaboration with the partner university) are now fully functional and conducting both PI-led and industry-sponsored clinical trials and intervention studies. The CRFs support clinical studies and interventions from design and regulatory compliance, through the accrual and follow-up phase, to data management. CRFs now enable many projects to be conducted in a safe and high-quality environment – projects that would previously not have been feasible. - The HRB Clinical Research Co-ordination Ireland (HRB-CRCI) is coordinating of the establishment of multi-site clinical trials in CRFs and CRCs nationally and with international partners and to facilitate industry linkage with the CRF network. The CRFs and CRCI are an integral part of the infrastructure that supports the recently established national Health Innovation Hub.

- o The HRB, in its Strategy 2016-2020 *Research Evidence Action* has placed focus on support for PI-led clinical trials and interventions and is developing a new suite of calls in this area
- o A Trials Methodology Research Network has been established to facilitate capacity for complex interventions and new trials methodology development in Ireland.
- o The HRB is also engaging with DOH about Irish membership of the European clinical trials research infrastructure, ECRIN-ERIC.

In relation to the establishment of a national bio-banking system, the **HRB** is actively supporting development of an ISO process for international standards for biobank sample collection, labelling, storage and access.

The **EPA** has collaborated closely with the HSE in order to develop possible research collaboration opportunities in the Environment & Health area. This included the first ever national conference on environment and health in November 2016, where a number of relevant research projects were showcased. In addition, the EPA has liaised with the HRB and DoH through its Sustainability Research Coordination group, as part of its role in coordinating environmental research in Ireland. In May 2017, the EPA (in collaboration with the HSE) has published a Tender on Priority Settings for Environmental & Health Research.

Action No. 4.9 European Research Area	**Support exceptional researchers, talent and leadership in health research and build a strong enabling environment for Irish health research, nationally and internationally.**
Description	a. Support innovative, investigator-led and internationally competitive research to address major health challenges b. Support the conduct and evaluation of healthcare intervention studies in order to improve health outcomes and health service delivery c. Support partnership-driven research, information and evidence that meet the needs of the Irish health and social care system. d. Support exceptional research, talent and leadership in health research. e. Build a strong enabling environment for Irish health research nationally and internationally
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	Health Research Board
Progress Update	The **HRB** Strategy 2016-2020 *Research Evidence Action* sets out five strategic areas of focus, as described above) and has been developing a suite of new schemes, and revising existing schemes, to deliver on these focus and enabler areas. The HRB is continuing to align its clinical, population health, health services research and health information portfolios with the policy and clinical practice agendas of the Department of Health and the healthcare system, but taking into account the broader aims of Government science, technology and innovation policies. In addition to its existing suite of funding mechanisms the HRB developed a number of new initiatives in 2016/2017 to support the HRB Strategy 2016-2020 *Research Evidence Action* including: o Development of an Investigator Led Project scheme to support innovative,

investigator-led and internationally competitive research to address major health challenges.

- o Development of a Definitive Interventions (DIFA) scheme to Support the conduct and evaluation of healthcare intervention studies in order to improve health outcomes and health service delivery, the first awards of which will be made in 2017.
- o Development of an Applied Partnership Award (APA) scheme to support partnership-driven research, information and evidence that meet the needs of the Irish health and social care system.
- o Development of an Emerging Investigator Award, and cofounding of a PhD Scholars Programme for Clinical Academics with Wellcome Trust to support exceptional research, talent and leadership in health research.
- o Organisation of a number of national workshops on Open Data, Open Access and Research Integrity and participation in European policy groups for same, providing support for ISO standard developments of international standards to ensure a strong enabling environment for Irish health research nationally and internationally.
- o Development of a four-year Implementation Research Funding Evaluation Plan (2017-2020) to enhance monitoring and evaluation of HRB investment. The HRB are currently talking to UK colleagues about their approach to evaluation of research outcomes and impacts (Wellcome Trust), and developing indicators and metrics to evaluate 'pathways to impact' i.e. actions and outputs with the potential to deliver impacts in the future (RCUK).

As part of its 2017 **EPA** Annual Research Calls, research topics on AMR (up to €650k), Human biomonitoring and Air quality impact on human health will be cofunded with the HSE. In addition, the HSE and EPA have jointly advertised a tender for Priority Setting exercise in the field of Environment & Health Research on the 25th May 2017. The EPA & the HSE have continued their collaboration in relation to the management of the two cofunded projects (2015 Research Call), which will support the Healthy Ireland Initiative. The EPA also participated in the Interdepartmental Consultative Committee on Antimicrobial Resistance (AMR) hosted by Department of Health (DOH) and DAFM; and contributed to the preparation of the National Action Plan on AMR.

Action No. 4.10 b APJ 2017 No. 87	**Support collaboration between the health system and enterprise leading to development and commercialisation of new healthcare technologies and to facilitate the health system to find efficiencies and improvements.**
Description	b. Explore and develop collaborations in the context of the eHealth Strategy for Ireland and the Knowledge & Information Strategy.
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	D/Health and HSE
Progress Update	Since its foundation, the eHealth Ireland Ecosystem has delivered a comprehensive programme of events, consultations, roundtables, and general collaboration among the main stakeholders. An eHealth Ireland & N. Ireland 1st Joint Ecosystem event took place on 1st December 2016. Among the subjects discussed were Cross Border

collaboration, EU funding and the benefits and opportunities for Interoperability & Common Standards. The first ecosystem meeting of 2017 took place on the 17th May in Dublin, bringing together clinical, research and digital entities.

The HSE now has revamped its ICT management function and working in the context of the eHealth strategy (2013) and the HSE Knowledge and Information Plan is now in a stronger position to exploit the numerous opportunities provided by modern eHealth capability to improve the health service delivery. As part of the eHealth Strategy for Ireland implementation, an eHealth Ireland Advisory Committee has been set up. It will advise the Director General of the HSE and includes representatives of the enterprise sector.

Action No. 4.11	**Future agri-food research to be informed by consumer insights to improve translation of research output into commercial products on market.**
Description	Explore with industry the potential for developing a Centre for Consumer Insight to inform future investment in research and development by Irish agri-food research bodies.
Status	**Complete**
Implementation Date	2016
Lead Responsibility	**DAFM/Bord Bia**
Progress Update	An integrated, state-of-the-art Consumer Research and Market Insight Centre was launched by Bord Bia in September 2016.

Action No. 4.12	**At producer level, prioritise research and innovation investment in processes and technologies which improve productivity and sustainability of production.**
Description	Progress research investment areas identified in SHARP.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	DAFM, (EPA)
Progress Update	Eight new projects addressing this action were awarded grants totalling €7.5m in December 2016 arising from **DAFM**'s 2015 Research Call. The areas funded aligned with priority investment areas identified in the SHARP strategic research and innovation agenda that gives effect to the 2 main food related RP priority areas. Future DAFM Research Calls will continue to be informed by SHARP priorities in this regard. The **EPA** has funded research projects in the area of sustainable agriculture and Climate Change, as well as Water Quality (in line with the SHARP Agenda and the EPA Research Strategy 2014-2020).

Action No. 4.13	**Improve coordination between industry, State agencies and research institutions to support the delivery of research that will deliver commercial outputs and products.**
European Research Area	
Description	Review agri-food sector innovation capacity; review coordination of agri-food research technology centres.
Status	**Initiated**
Implementation	2016-2020

Date	
Lead Responsibility	DAFM, Teagasc, MI
Progress Update	This Action links to Action 189 of Food Wise 2025 which calls on the **DAFM-**hosted, broad stakeholder based, National Agri-Food Research & Innovation (NAFRI) Group to review coordination of agri-food research technology centres to ensure resources are applied most efficiently. NAFRI had a preliminary discussion about this issue at a meeting in late 2016 and concluded that in the case of the agri-food, forestry (and possibly the marine) sector this review could best be progressed through a sub-group that would include representatives from DAFM, Teagasc, EI, MI & SFI (all of which are represented on NAFRI). The national marine R&I Strategy includes an assessment of industry involvement (e.g. collaborative level up). Funding in progress by the **MI** includes: o MARTERA – €1m funding to ERA net which will involve industrial and academic partners o ERA-MBT - €0.3m funding to ERA net which involves industrial and academic partners o On foot of the R&I strategy publication investment is planned by the MI in a new Open Industry Call, which will deliver commercial outputs.

Action No. 4.14 European Research Area	**Improve capacity of agri-food companies to absorb research and innovation output from research bodies.**
Description	a. Develop proposals for a Food Innovation Hub at its Moorepark campus. b. Lead research in collaboration with other research institutions and industry to derive applications from the significant investment in foods for health. c. Complete the €10m upgrade of Moorepark Technology Limited pilot plant. d. DAFM to continue to partner with the Irish Research Council's employment based Research Programme to facilitate the placement of post-graduate research students in agri-food enterprises. Develop further joint research / funding initiatives in Precision Agriculture. e. DAFM funded Agri-Food Graduate Development Programme to continue to upskill agri-food graduates for employment
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**a.** Teagasc **b.** Teagasc **c.** Teagasc **d.** DAFM, IRC, SFI **e.** DAFM lead, Teagasc
Progress Update	**a.** Proposal for a Food Innovation Hub: The demand from industry for such a facility remains high, and the benefits that would accrue from product and process innovation are even more keenly required in order to facilitate market diversification in the face of BREXIT. Discussions are on-going with government departments in relation to the capital funding required. **b.** A cluster of PhD students between Moorepark food and Alimentary Pharmabiotic Centre (APC) has been established and students will start in Autumn 2017. This will focus on applications from existing investments in food-for-health. Continuing scale up of bioactive compounds from Food for Health Ireland (FHI) for incorporation into foods with health benefits and this has attracted considerable interest and licensing opportunities. The expansion of MTL (see (c) below) will considerably enhance capabilities in the Food

Fermentation/Biotransformation, and associated Food and Health, space. Teagasc also plans to build a €1,000,000 Food Biotest facility to be located at Teagasc, Moorepark.

c. Design Phase completed. Planning permission has been sought and a decision is expected in the very near future. Substantial work has been completed on the design of the facility and selection of new equipment for investment.

d. The **IRC** EBP 2016 Call is completed with 30 pending awards, 7 of which are broadly in Agri-Food domain. To date **DAFM** has committed approx. €724,000 to the IRC for the funding of 5 M.Sc and 9 PhD placements in agri-food, forestry, fisheries and bioeconomy enterprises. DAFM has agreed to continue to partner with IRC in the 2017 employment based Research programme and is awaiting the outcome of the Call. An **SFI** Research Centre proposal in the area of agri-food (Innovative technologies to support the production of dairy products: From Pasture, To Cow, To Food. Project Title: Future Milk) was approved in principle by the SFI Board following stringent assessment by international peer review. SFI is currently seeking additional funding to support this centre over the next six years.

e. Registration is open for a further four new modules in the **DAFM** Agri-Food Graduate Development Programme through the second half of 2017.

Action No. 4.15	Invest strategically in the bio-based economy, rural development and along the food chain.
Description	Identify and progress research, development and innovation investments in the bio-based economy, in rural development and in reducing losses along the food chain.
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	DAFM, (MI), (Teagasc), (EPA)
Progress Update	Five new projects addressing this action were awarded grants totalling €2.3m in December 2016 arising from **DAFM**'s 2015 Research Call. Future DAFM Research Calls will continue to address this area. Almost all of **Teagasc**'s Walsh Fellowships funded in 2017 were in the areas of bio-based economy, rural development and reducing losses along the food chain. The **MI** will adopt a targeted approach to co-funds based on R&I strategy – introduce MI researchers to international consortia. MI is funding ERA-MBT project to add value to current food production. MI have planned investment in an ERA-net on Blue Bio Economy Co fund which will likely commence in 2018. The **EPA** has funded new projects relevant to the bio-based economy. The EPA has also reviewed its portfolio of ongoing research projects during the January 2017 Scoping Exercise on the BioEconomy. The EPA is currently funding €2.425m towards research projects (currently ongoing) relevant to the bio-economy and an additional €1.21m towards research projects with a notable bio-economy aspect (currently ongoing).

Action No. 4.16 APJ 2017 No. 35	Develop a national bio-economy (policy statement or) strategy

Description	Develop a bio-economy (policy statement) strategy to identify opportunities for Ireland to build innovative (and sustainable) enterprises to address the global requirement for replacing fossil-derived consumer goods with bio-based alternatives.
Status	**Initiated**
Implementation Date	2017
Lead Responsibility	**DAFM, DCCAE, DHPCLG, relevant funders**
Progress Update	The **DAFM** funded BioÉire project (led by **Teagasc** and now reaching conclusion), has inter alia, highlighted the prioritised value chains of the bioeconomy to help inform the production of a national bioeconomy policy statement. DAFM is a member of the Inter-Department Group coordinated by D/Taoiseach that is developing the national bio-economy policy statement and is playing a very significant and active role in this process. Accordingly, for the present at least, overall responsibility for this action resides with D/Taoiseach. BioÉire also co-hosted, with Dept. of An Taoiseach, a consultative seminar on the bioeconomy.

Action No. 4.17 APJ 2017 No. 144	**Support progress towards the Harnessing Our Ocean Wealth targets through coordinated marine research and development strategies**
Description	a. Publish and implement a National Marine Research & Innovation Strategy to 2020. b. Implement the recommendations of the Interdepartmental Marine Coordination Group, Development Task Force focused on research translation and development.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**a. Marine Institute** **b. Funding departments and agencies**
Progress Update	**a. MI:** Publication of the Marine Institute's national research and innovation strategy will be launched at the MI Ocean Wealth Summit at the end of June. **b. DCCAE** are working towards full coordination on this. During the reporting period, the **EPA** and the **Marine Institute** have agreed to jointly cofund the Irish participation in the upcoming Joint Call of the BiodiVERsA network (in the area of marine biodiversity). The Marine Institute will be cofunding one topic of the 2017 EPA Research Climate Call. In addition, the EPA has liaised with the Marine Institute via its Sustainability, Climate & Water Research Coordination Groups, as part of its role in coordinating environmental research in Ireland. Marine renewable energy is a priority area under RP and **SEAI** supports this sector through an Ocean Energy Prototype Development Fund. This fund stimulates the development and deployment of ocean energy devices and systems with an emphasis on industry-led projects. Since 2009, SEAI has grant-aided in excess of €14m to over 80 projects. These range from early stage proof of concept tests of novel technologies in

	laboratory facilities to real sea deployments of pre-commercial devices.

Action No. 4.18	**Implement the actions identified in EPA Research Strategy 2014–2020**
Description	Support and inform transformation of Ireland's economy and society to a sustainable base with reduced environmental damage and adverse impacts on human health, by generating evidence and building models to inform policy development and implementation, and developing solutions through novel technologies and methods that address global and regional challenges.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**EPA**
Progress Update	The EPA has the role of coordinating environmental research in Ireland and supports R&D activities (mainly via its Annual Competitive Research Calls) in a range of environmental areas. The EPA Research Programme aims to identify pressures, inform policy and develop solutions.

Environmental Research Programme 2014-2020

The EPA published its Research Strategy for the period 2014-2020, a process which involved substantial stakeholder engagement (over 600 stakeholders attended seven workshops). The research programme is based around "three pillars" (climate, water and sustainability), representing the key research priorities associated with delivering a protected Irish environment.

EPA Research Activities 2016-2017

In 2016, the EPA committed €7.9 million to fund 45 new projects on the following topics: Water (11), Climate (14), Green Enterprise (10) and Sustainability (10). In terms of research management, in 2016, there were 244 on-going research projects. 35 Research Publications were released in 2016. In November 2016, the Joint Research Programme on Environmental Impacts of Unconventional Gas Exploration & Extraction concluded with the publication of 11 reports. The programme was designed to produce outputs to assist regulators – both North and South - in fulfilling their statutory roles regarding impact assessment and regulation of any potential UGEE operations in Ireland.

Since January 2017, 11 EPA Research reports have been published. The EPA has a budget of €8.2m in 2017, with just over €2m for new research awards in 2017. In May 2017, the EPA has launched its 2017 Annual Research Calls – with a closing date of 3rd July 2017.

Over the reporting period, EPA Research has continued liaising with its three Research Coordination Groups for each of its three Research Pillars, which aim at:

- o Increasing awareness, synergies and communication amongst Irish research funders; and
- o Coordinating and reducing the fragmentation of environmental research in Ireland.

The EPA is also co-funding environmental research in partnership with Fulbright, Science Foundation Ireland, the Geological Survey of Ireland, Irish Research Council, the Health Service Executive, the Marine Institute and Department of Agriculture, Food and the Marine. The EPA also participated in the Interdepartmental Consultative Committee on Antimicrobial Resistance (AMR) hosted by Department of Health (DOH) and DAFM.

The EPA is the National Delegate and Contact Point for Horizon 2020 Societal

Challenge 5 (SC5). The Annual EPA Horizon 2020 SC5 Information Day was held on the 7th October 2016 in Croke Park with more than 230 registrations, and presentations from EPA Director General and various invited speakers from Europe. In addition, there were five Roadshows held in 2016 in third level institutions

The EPA collaborated with EU research programming through the:
- Water Joint Programming Initiative (co-chaired by the EPA since 2014) and associated EC-funded Horizon 2020 projects: WaterWorks2014, WaterWorks2015 and IC4Water.
- Climate Joint Programming Initiative and associated EC-funded Horizon 2020 project ERA4CS.
- BiodivERsA: The EPA became an Observer in the network in late 2016.
- EnvHealth: Network of funders in the area of Environment & Health.
- Share '5 Agencies' Programme.
- EU Raw Materials European Innovation Partnership (EIP): EPA Research maintained its participation in the multi-million cross Directorate EU programme on raw materials (incorporating - research, circular economy, innovation, development). This role is coordinated with DCCAE.

The EPA Research programme has an active communications programme. In addition, EPA-funded projects must comply with an Open Access and Open Data policy for all the outputs arising from the projects.

Action No. 4.19	Create high-impact ventures out of opportunities in the research base and accelerate business model innovations
Description	Continue to support the National Digital Research Centre
Status	Ongoing
Implementation Date	Ongoing
Lead Responsibility	DCCAE
Progress Update	In May 2017, NDRC partnered with Enterprise Ireland and the PorterShed Accelerator in Galway to further enhance the High Potential Start-up (HPSU) eco-system and develop start-up capability, infrastructure and capital investment within the region. Successful applicants to the accelerator will receive membership and a place within NDRC at PorterShed for a period of 100 days, where teams will be able to build and commercially validate their technologies by working with existing entrepreneurial networks and mentors. The Accelerator programme is part of Enterprise Ireland's overall strategy for increasing the number and quality of start-ups that have the potential to employ more than 10 persons and achieve €1 million in export sales within three years. Over 50% of the companies NDRC invests in go on to receive follow on investment, allowing them to continue on their path to growth.

Action No. 4.20	Implement research-related actions in the Energy White Paper and forthcoming Energy Research Strategy
Description	Build on the integration of energy research, development and commercialisation support activities to further develop a coherent energy innovation process and to ensure maximum impact from our investment in energy research.
Status	Ongoing
Implementation Date	2016-2020

Lead Responsibility	DCCAE
Progress Update	The Energy Research strategy sets out an ambitious vision for world class energy-related research in Ireland. **DCCAE** are developing implementation measures for the Strategy. **SEAI** has a key role to play in delivering on this vision through promoting, coordinating and assisting research, development and demonstration of sustainable energy technologies. This is a central part of SEAI's remit as set out in the Sustainable Energy Act (2002) which is to support solutions to overcome technical and other barriers to market deployment of sustainable energy technologies and to provide an authoritative evidence-base to inform policy making. SEAI has been operating its Research, Development and Demonstration (RD&D) programme since 2002 and over €25 million has been allocated for feasibility studies, related RD&D and shared-cost demonstration activities. This programme builds research capacity, aligned with Ireland's and EU priorities, while providing a feeder for researchers to achieve success in Europe. This assists in the delivery of the National Energy Efficiency Action Plan (NEEAP), National Renewable Energy Plan (NREAP) and 2015 Energy White Paper. During the reporting period, the **EPA** provided SEAI with a listing of EPA-funded research projects relevant to Energy. As of March 2017, there were 20 **on-going** projects relevant to Energy funded by the EPA. Energy-relevant topics were also included as part of the 2017 EPA Research Climate Call.

Action No. 4.21	Implement *Geoscience Research Strategy*
Description	Implement actions identified in *Geoscience Research Strategy 2015–2020*
Status	Initiated
Implementation Date	2020
Lead Responsibility	DCCAE/GSI
Progress Update	KPIs in the published Research Roadmap are being met and on track. During the reporting period, **EPA** Research maintained its participation in the multi-million cross Directorate EU programme on raw materials (incorporating - research, circular economy, innovation, development). This role is coordinated with DCCAE. In November 2016, the Joint Research Programme on Environmental Impacts of Unconventional Gas Exploration & Extraction concluded with the publication of 11 reports. The programme was designed to produce outputs to assist regulators – both North and South - in fulfilling their statutory roles regarding impact assessment and regulation of any potential UGEE operations in Ireland. In addition, the EPA awarded in 2016 a research project cofunded with the GSI, as well as research projects on raw materials. The EPA has also agreed to cofund with the GSI the Irish participation under the EU ERAMin 2017 Joint Call.

Action No. 4.22	Develop a network to support researchers and business partners in addressing economic and societal challenges in geoscience
Description	Establish and strengthen networks for geoscience collaborators to increase impact of research outputs and to help secure non-exchequer funding
Status	Initiated
Implementation Date	2017

Lead Responsibility	DCCAE/GSI
Progress Update	Geoscience Ireland business cluster of SMEs developed with EI. Cluster expanding annually (33 members currently) with 179 new jobs created in 2016 (477 since inception in 2012).

Action No. 4.25 APJ 2017 No. 88	Develop the Defence Enterprise Initiative further over the course of the White Paper.
Description	a. Continue to support Ireland-based enterprise in its engagement with the European Defence Agency (EDA) and in accessing EDA and Horizon 2020 programmes. b. Continue to progress opportunities for cooperative-collaborative engagement between the Defence Forces and Ireland-based enterprise and research institutes.
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	a. **D/Defence, Enterprise Ireland** b. **D/Defence, Enterprise Ireland, HEIs**
Progress Update	A **D/Defence** strategy is currently under development which will continue the work already underway in supporting Irish Enterprise and research institutes. **(a)** EI engaged with DoD regarding EDA a few years back in the context of its Joint Investment Programme in CBRN. That had a successful outcome as an Irish SME Aquila won a contract as did NUIM. More recently the NCP has promoted the Pilot Action and subsequently the Preparatory Action in Defence Research (PADR) with modest reaction – that said there was a good albeit unsuccessful submission to the Pilot Action. As regards Horizon 2020, a project called ROCSAFE led by NUIG with the Irish Army was funded from the 2015 'Secure Societies' Call (the contract was signed in 2016). Crucially, with EI encouragement, DoD has established a good process for deciding whether or not to participate in H2020 consortia. **(b)** EI has been active in pushing DoD to address IP issues as a prerequisite to cooperative-collaborative engagement. The Defence Enterprise Committee (DEC) meets 2-3 times per year and is attended by the EIs reps. It discusses ongoing military interactions with industry/research organisations in the national and H2020 contexts.

Action No. 4.26	Establish a Security and Defence Enterprise Group
Description	This group will bring together enterprise and academic researchers and practitioners in the areas of security and defence with the purpose of identifying areas of common endeavour and collaboration.
Status	Ongoing
Implementation Date	2016/2017
Lead Responsibility	D/Defence
Progress Update	Discussions have commenced and options are being developed regarding the establishment of a Security and Defence Enterprise Group.

The Role of Intellectual Property in Innovation

Action No. 5.3 APJ 2017 No. 95	Encourage commercialisation of publicly-funded research
Description	All funders of public research will increase the commercialisation of the research that they support, using the available commercialisation & technology transfer programmes, to ensure the efficient transfer of economically valuable research outputs to enterprise and to meet the following targets: **a.** Commercially relevant technologies (Licences, Options, Assignments): 175 (per annum by 2020) **b.** Spinouts: (40 per annum by 2020) **c.** High Potential Start Ups (HPSUs) from Spinouts: (16 per annum by 2020) **d.** Collaborative research projects between enterprise and the public research system: (920 per annum by 2020)
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	**EI, All research funders**
Progress Update	The outturns in 2016 were as follows: 186 for Licences Options, Agreements, 26 spinouts, 15 HPSUs from Research and 1,036 collaborative research projects between enterprise and the public research system were achieved.

Action No. 5.4	Set new targets for the commercialisation of research
Description	Develop new impact metrics for commercialisation of publicly funded research and set targets for both outputs and impacts commensurate with increased public investment.
Status	**Complete**
Implementation Date	2017
Lead Responsibility	**DBEI /** EI
Progress Update	New targets for Commercialisation e.g. Licenses, Agreements, Spin Outs etc. are set out in TTSI 3, launched in January 2017, and based on the level of investment in HEIs. In the future, these targets will increase, commensurate with increases in public investment.

Action No. 5.5 APJ 2017 No. 95	Implement a successor to the current Technology Transfer Strengthening Initiative and review the operations of KTI
Description	Launch a further TTSI programme (TTSI 3) to embed knowledge transfer within the public research system; review operations and funding of KTI.
Status	1. **Complete** 2. ongoing

Implementation Date	2017
Lead Responsibility	**DBEI, EI with IUA**
Progress Update	1. TTSI3 launched and commenced January 2017 2. KTI strategic plan presented to EI Executive Board May 17 and will be presented to EI Board June 17

Action No. 5.6	**Raise IP awareness**
European Research Area	
Description	Strengthen IP awareness of the opportunities for firms to engage in IP activity.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	DBEI, Patents Office, EI and LEOs
Progress Update	In 2017, the Patents Office has so far participated in 29 business orientated IP awareness raising events of which 24 involved presentations to participants of Start Your Own Business courses hosted by LEOs countrywide. Additionally, the Office co-hosted an IP seminar with EI in Dublin as well as taking part in the National Research & Innovation Expo, the Business Support Showcase, the Business Summit Expo and an Innovation event with Offaly LEO all for the business community.

Action No. 5.7	**Build IP capability and resilience at enterprise level**
European Research Area	
Description	Focusing on Ireland-based R&D-active and export-oriented client base, establish an inter-agency group (led by EI) to develop a roadmap for building IP capability and resilience at enterprise level.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	EI, DBEI with relevant agencies
Progress Update	**EI** continues to provide 1st point of contact guidance for clients on IP issues and directs clients to other sources of IP support such as the EU IPR helpdesks as appropriate. Engagements arise from Development Advisor-Client interactions normally in relation to R&D and other innovation supports. This leads to approximately 50 one-to-one engagements throughout the year. EI in partnership with the Patents Office ran an IP awareness event targeting RD&I active companies across all sectors in May 2017. The event 'Building Business on Ideas' focussed on the role of IP in R&D and enterprise scaling. The event attracted 50-60 participants on the day. Review of the event is currently underway. EI and the Patents Office plan to run additional events of this nature throughout 2017 with one focussed on Trade Secrets and the Knowledge Development Box (KDB) currently at planning stage and one on IP in the medical device industry planned for October. In support of the above activities EI is participating in the EU funded VIP4SME

Project, in co-operation with the Patents Office with a view to developing a more co-ordinated approach to SME IP awareness and providing a greater suite of IP management tools based on EU best practice.

EI is at an advanced stage of developing a financial support, in the form of grant aid, for clients in receipt of EI RD&I supports, to assist them with implementation of IP strategies appropriate to their R&D activities and business strategies. This support will be piloted throughout the latter half of 2017 and into early 2018. In parallel with developing IP Strategy support to complement existing RD&I supports, EI is developing awareness and guidance material on the interconnectivity between the EI support programmes, the R&D tax credit and the KDB.

In partnership with NSAI and the Irish Innovation Management Standards Committee (IIMSC), EI is participating in an International Standards Organisation project to develop a new ISO Innovation Management Standard. The focus of EI's participation is on tools and methods of innovation management and the current work programme is leading to a guidance standard on IP management in innovation, with a particular emphasis on the needs of SMEs. Models developed by EI are being used as key reference materials for this work and co-ordination through the IIMSC aims to ensure the needs of Irish industry is reflected.

The EI Market Research Centre provides clients and EI technical advisory staff with a leading IP analytics tool with a view to encouraging and supporting clients to engage in more effective IP research. This is helping clients by making the innovation knowledge embodied in the IP databases more accessible and enabling them focus in on opportunities for R&D, collaboration and commercialisation.

EI continually reviews its materials and tools to facilitate optimum IP engagement with its clients. The Intellectual Assets Audit Starter Tool, developed by EI, was recently shared with the IP Unit of DBEI as a contribution to its participation in EU IP SME Pre-diagnostic Project.

Action No. 5.8	Invest in widespread IP education
Description	Review opportunity to include modules on IP management in relevant courses in higher education.
Status	Initiated
Implementation Date	2017
Lead Responsibility	HEA/DES
Progress Update	The Department of Education and Skills has written to all universities and Institutes of Technology seeking details on the courses within their institution that currently include an IP module; whether the institution has proposals to either expand on the number of courses that include IP modules, or to enhance the IP module on existing courses. A report will be compiled from the responses.

Action No. 5.9	Measure progress of IP activity in firms
European Research Area	
Description	Develop an approach for measuring and monitoring progress of IP activity in the firm

base.

Status	**Initiated**
Implementation Date	2017
Lead Responsibility	**Inter-agency group at 5.7**
Progress Update	In 2016 Enterprise Ireland presented the first draft of a paper outlining a strategy to increase IP activity in innovative Irish enterprises. A second draft of the document, entitled "Supporting greater IP awareness and activity in the Irish Firm Base. *Roadmap for planned interventions targeting RD&I active EI client companies.*" The second draft of the document proposes a methodology for measuring and monitoring progress and will be reviewed at the next meeting of the Inter-agency group.

Action No. 5.10	**Introduce legislative changes relating to copyright**
Description	Bring forward legislative proposals to implement reforms recommended by the Copyright Review Committee aimed specifically at exploring greater use of certain copyright exceptions to promote innovation.
Status	**Initiated**
Implementation Date	Publication of the Bill and commencement of passage of the Bill through the Houses of the Oireachtas expected in 2017. Implementation date dependant on Bill being placed on Government Legislative Programme etc.
Lead Responsibility	**DBEI**
Progress Update	The heads of a Copyright Bill entitled Copyright and Related Rights (Amendment) (Miscellaneous Intellectual Property) Bill 2017 were approved by Government in 2016. Drafting of the Bill is well advanced with the Office of Parliamentary Counsel and publication anticipated in 2017.

Action No. 5.11	**Improve patenting options for business**
European Research Area	
Description	Implement European unitary patent system and work with stakeholders to make the case for approval by referendum of the Unified Patent Court with a presence in Ireland.
Status	**Initiated**
Implementation Date	Implementation date is dependent on a Government decision to hold a referendum on the UPC and cannot be progressed without a positive referendum result
Lead Responsibility	**DBEI**
Progress Update	The required number of ratifications to the Agreement on a Unified Patent Court (13) to trigger entry into force of the European unitary patent system has not yet been reached. Work on establishing the UPC is well advanced and may, with the requisite number of ratifications, including France, Germany and the UK, come into operation in late 2017/early 2018.

Action No. 5.12	**Address cost issue of IP enforcement through access to the lower court**
Description	Improve accessibility and cost issues for IP enforcement by facilitating enforcement of lower value claims through the lower courts.
Status	**Initiated**

Implementation Date	Implementation date is linked with Action 5.10
Lead Responsibility	**DBEI/DJE**
Progress Update	The Copyright and Related Rights (Amendment) (Miscellaneous Intellectual Property) Bill 2017, referred to at Action 5.10 makes provision for lower value IP cases to be brought before the Circuit and District courts. This is intended to go towards reducing the cost of IP enforcement.

Action No. 5.13 APJ 2017 No. 84	**Support the Knowledge Development Box**
Description	Develop outline scheme and attendant legislation to support the Knowledge Development Box for qualifying IP assets.
Status	**Complete**
Implementation Date	2017
Lead Responsibility	**DBEI,** Patents office
Progress Update	The Knowledge Development Box (Certification of Inventions) Act 2017 (No.6 of 2017) was enacted on 12 April and came into operation on 19 May 2017. The KDB certification scheme will enable SMEs to qualify for the lower rate of corporation tax while the re-introduction of substantive patent examination will ensure that Irish patents continue to quality for the lower corporate tax rate.

Innovating with the EU and the Wider World

Action No. 6.1 APJ 2017 No. 94	**Secure €1.25bn in funding from Horizon 2020**
Description	Optimise sectoral engagement (the higher education sector, industry and publicly funded research bodies) in Horizon 2020 to achieve the national target.
Status	**Ongoing**
Implementation Date	2020
Lead Responsibility	High Level Group, Horizon 2020 National Support Network, research performers (**DBEI** to coordinate**)**
Progress Update	Ireland has won a total of €424 million in competitive EU funding from the Horizon 2020 programme from 2014 to May 2017. Higher Education Institutions accounted for €232.7 million of the total and companies won €151.4 million. SMEs received €94.3 million of the funding to companies. This performance has Ireland on track to achieve the national target. Overall, Ireland has the highest success rate in Europe's Horizon 2020 SME Instrument (16%, compared with an EU average of 6%).

Action No. 6.2	**Catalyse the creation of and participation in consortia to bid for large-scale Horizon 2020 projects**
Description	a. Ongoing analysis of large scale opportunities, facilitating of linkages between potential Irish leads and partners for consortia b. Provide support and co-funding for large bids to H2020 led by Ireland
Status	**Ongoing**
Implementation Date	2020
Lead Responsibility	a. **Strategic Research Proposals Group, reporting to High Level Group** b. **Horizon 2020 National Support Network, Research funders** (**DBEI** to coordinate**)**
Progress Update	A series of four thematic workshops (ICT, Health, Energy and Transport), with participants from relevant Government departments and state agencies, as well as the National Contact Points, was held in September 2016 to develop strategic and coordinated approaches to the corresponding H2020 programme areas. Four more workshops were held in June 2017 to develop a strategic approach to the Work Programme for 2018-20. These workshops considered the four cross-cutting, focus areas in the work programme (Climate, Digitisation, Circular Economy and Security).

Action No. 6.3	**Influence EU Commission in formulating the work programme and represent Ireland's interests**
Description	Canvass intelligence from relevant stakeholder communities and effectively represent Ireland's position.

Status	Initiated
Implementation Date	Through-out lifetime of Horizon 2020
Lead Responsibility	Horizon 2020 National Support Network, Irish Permanent Representation Brussels, Irish Research Community
Progress Update	All actors (National Contact Points, National Delegates, Perm. Rep., Enterprise Ireland and Science Foundation Ireland) are active in Brussels both in gathering intelligence and in seeking to influence the Horizon 2020 Work Programme for 2018-20 and next Framework Programme, FP9. This is being effected in formal and informal fora such as Programme Committees and bilateral meetings with other Member States and the Commission.

Action No. 6.6 European Research Area	**Ensure effective national coordination and oversight of participation by Ireland in Joint Programming Initiatives**
Description	National Steering Group for Joint Programming Initiatives will meet up to twice a year, with bilateral meetings as appropriate to ensure effective oversight.
Status	Ongoing
Implementation Date	2016-2020
Lead Responsibility	**DBEI**
Progress Update	The National Steering Group for Joint Programming Initiatives met on 21st October 2016 and DBEI officials maintain two-way communications with the group in relation to developments at the relevant EU officials' forum. The National Steering Group will convene again in the third quarter of 2017.

Action No. 6.7 APJ No 94 ACTION PLAN FOR JOBS / European Research Area	**Enhance national participation in JPI and ERA-NET initiatives.**
Description	Develop further involvement in relevant JPI activities.
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	Relevant research funders (SFI, HRB, DAFM, Teagasc, MI, EPA, D/Arts and Heritage Council)
Progress Update	Ireland is now a participant in eight of the 10 JPIs currently in operation, this follows HRB's recent decision to join the JPI for Antimicrobial Resistance. **DBEI** is an active participant in the European Research Area officials' group which is responsible for co-ordinating the activities of the 10 JPIs. **SFI** have a dedicated process in place for engagement in ERANets and JPIs, which assesses the potential national impact among other things. Currently SFI is supporting five ERANets and two JPIs. The **HRB** recognises, values, and supports engagement in EU-funded research as a

fundamental tool to increase the impact research has on society and the economy. Enhanced participation is a strategic priority for Ireland under the EU Horizon 2020 Framework Programme. The HRB is keen to ensure that Irish health researchers are exposed to the significant opportunities presented within the core Societal Challenge Health, Demographic Change and Wellbeing, within wider interdisciplinary partnerships and within cross-thematic joint funding initiatives.

Since 2016, the HRB has in place a Strategy for Engagement in European Research that sets out its willingness to consider new EU co-funding partnerships, both for facilitating engagement of Irish health researchers at EU level and for HRB engagement in its own right. An implementation structure, process and budget for engagement in EU Public-to-Public partnerships has been developed that is fully integrated into the systems and procedures of the HRB. Initiatives currently being supported by the HRB include: JPI More Years Better Lives 2017 Call, JPI AMR 2017 Call, JPI HDHL 2017 Pillar 1A Effectiveness of existing policies for lifestyle interventions, HCO6- 2016 Towards an ERA-Net on public health research TO-REACH WP 2016 and JPND Cross Diseases Analysis of Pathway 2017.

DAFM leads Irish representation on the Governing Boards of the FACCE and HDHL JPIs and has actively participated in meetings of these bodies and in progressing their respective agendas, initiatives and resulting actions. DAFM coordinated feedback and financial pledges from multiple national funders to ensure strategically important areas are considered for prioritisation by the EU SCAR Committee as ERA-Net co-fund topics in the 2018-2020 cycle of SC2 in Horizon 2020.

Teagasc is currently leading an ERA-NET Cofund on Greenhouse Gas Monitoring and Mitigation (FACCE ERA-GAS) on behalf of the JPI on Food Security and Climate Change (FACCE JPI). The first call is complete, with €14m committed to projects. Teagasc is also a member of the FACCE JPI Governing Board and an active member of Sustainable Animal Production (SusAn), cIPM (completed 2017) and ICT-AGRI ERA-NETs.

The **MI** is the national lead on JPI oceans – which has active and planned involvements with several ERA-nets including Martera, blue bioeconomy & Microplastics. The MI is involved with ERA MBT, and COFASP, and BiodiverSA.

The **EPA** has continued its involvement (at Governing & Management Boards level) in the Water JPI (which it is co-chairing since 2014) and the Climate JPI. The EPA is an active partner in the ERAnets COFUND WaterWorks2014, WaterWorks2015 and ERA4CS; as well as in the Coordination Support Actions WatEUr & IC4Water. The EPA is also a partner in the new ERAnet proposals submitted under the Horizon 2020 2017 Call: WaterWorks2017 and AXIS. The EPA joined the BiodivERsA network as an Observer in December 2016 and is a partner in the BiodivScens 2017 ERAnet proposal (with cofunding from the Marine Institute for the proposed Joint Call). The EPA has continued its involvement in the ENvHealth network (follow-on network of the related ERAnet).

Action No. 6.8 APJ 2017 No. 94	**Enhance collaboration with the UK**

Description	a. Co-fund with the Wellcome Trust biomedical and clinical research in Ireland b. With Royal Society, support University Research Fellowship scheme for early stage researchers to carry out research in Ireland c. Supports collaborative research between Irish and UK researchers in key areas d. Explore options for further collaboration, such as Horizon 2020, EIT and NCP Networks.
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	a. SFI, HRB b. SFI c. SFI, DAFM d. DBEI
Progress Update	**a&b:** Since the start of 2016, there have been 12 awards made under the **SFI**-HRB-Wellcome Partnership amounting to a total of €11m, there have been 6 awards made under the Royal Society-SFI partnership amounting to a total of €2.8m, and there have been 14 awards made under the BBSRC-SFI partnership amounting to €6.7m. The EPSRC-SFI partnership was launched in April 2017 and is now open to applications. In 2016 the **HRB** made a number of new investments through the Wellcome partnership: • A PhD Scholars Programme for clinicians (ICAT) worth €9.1M (funded by HRB and Wellcome Trust only) • Five Seed Awards worth €574k (all partners) • Two Investigator Awards worth €3.82M (all partners) **c&d:** Department of Agriculture, Environment and Rural Affairs DAERA collaborated with **DAFM** on DAFM's most recent Research Call which resulted in co-funding in 8 of the successful projects to a value of €2m. **SFI** has strengthened it collaborations with the major UK research funders. SFI now has bilateral partnership agreements with the Engineering and Physical Sciences Research Council; the Biotechnology and Biological Sciences Research Council; the Royal Society and the Wellcome Trust. These arrangements are independent of the EU and will enable Ireland to maintain its strong collaborative research links with the UK, irrespective of the future UK relationship with the EU Framework Programme for Research and Innovation. Both Ireland and the UK are members of a number of leading international research organisations that are independent of the EU: European Space Agency, European Molecular Biology Laboratory, COST, CECAM, ELIXIR and LOFAR[1]. UK funders are also members of Joint Programming Initiatives in which Ireland has an interest, in particulate the Healthy Diet for a Healthy Life JPI and JPND.

[1] Ireland joined LOFAR in July 2017.

The **HRB** has collaborated with UK organisations on a number of policy/legislative issues including the response developed by a number of UK funding organisations (Wellcome Trust, MRC etc.) on the implications for health research of changes to the Data Protection Regulations at European level. The HRB is part of the EU lobby group, led by the Wellcome Trust, advocating for common implementation of this Directive across EU Member States.

Other collaborative initiatives between the HRB and UK agencies/researches include:

- The US-Ireland R&D Partnership (see Action 6.10a)
- The HRB-Medical Research Charities Group Co-funding Awards are supporting a number of UK researchers who have expertise in rare disease projects that is not available in Ireland.
- The Oversight Group of the Centres of Excellence in Neurodegeneration Programme, in which the HRB is a joint founder was with many other European partners, is led by the UK Medical Research Council (MRC).
- Irish CRFs are now members of the UK Clinical Research Network and attend meetings (annual meeting 2013 was hosted by TCD), with many informal links being created.
- Our engagement with the Medical Research Council around development of the HRB Trials Methodology Research Network (HRB TMRN) was invaluable. There may be possible future opportunities to bid for UK/NI funding in this area.
- The Ireland-Northern Ireland–National Cancer Institute (US) Cancer Consortium provides co-funded training initiatives in cancer epidemiology, cancer nurse training, short courses on cancer prevention etc. between the three jurisdictions
- The HRB-TMRN research team have networked very strongly with the UK Clinical Trials Hubs, in particular in the development of research priorities around recruitment to trials, and participate in their annual meetings etc. They are currently working with the James Lind Alliance based within the National Institute for Health Research (UK) to prioritise research needs in the methodology for clinical trials.
- HRB engagement with the UK Cochrane Collaboration has allowed us to develop short training courses in systematic review for health professionals and academics, and facilitates Irish health researcher participate in training being held in NI.
- The All Ireland Institute of Hospice and Palliative Care (AIIHPC) was established in 2010 to bring together a broad range of expertise in the service delivery, academic preparation for and management of hospice and palliative care across the island of Ireland. The HRB provides support for a Structured Research Network within the AIIHPC, to bring researchers together in a coherent network to share knowledge across a broad range of topics of relevance to end-of-life care.
- In recent years, Irish researchers being able to join the UK Health Services Research Association which allows them to participate in annual meetings, expand their networks and learn from UK colleagues, who are more established researchers in this area.
- Though the current INTERREG V joint NI/ ROI bid the aim is to develop the infrastructure and capacity for health intervention studies in the border region. The total value of the programme €283 million, comprised of €240 million EU funding (85%) and €43 million of match funding, divided between Northern Ireland /Scotland and Ireland. Health is one of the four thematic priorities that

have been identified and the funding available for the health theme is €62m (€53m is ERDF).

o The HRB pays the Irish membership of the UK Cochrane Library, allowing anybody in Ireland such as researchers or healthcare professional to have access to the library in order to search for Cochrane systematic reviews in their area.

o The Cancer Registries North and South have a really strong working relationship, producing joint reports etc.

The **EPA** Research calls are open to UK researchers. There is an action in **Marine Institute's** R&I strategy to examine action (d) above.

Action No. 6.8e	Enhance collaboration with the UK
Description	e. **With UK Environment agencies in ShARE, support collaborative research for evidence to underpin environmental regulation.**
Status	Initiated
Implementation Date	2016-2020
Lead Responsibility	e. EPA
Progress Update	The ShARE project is a collaboration between the five Irish and UK environment agencies. The project aims to provide a flexible framework for inter-agency collaborations, enabling us to deliver and support collaborative research; and to share evidence to underpin our activities as environmental regulators.
	In the past 12 months the ShARE project shortlisted 14 projects for further development and scoping, from an initial list of 27 possible projects. Two were progressed (Site-specific damage costs for implementation of the Industrial Emissions Directive and SCAIL Agricultural Model).
	The ShARE team took an opportunity to plan for subsequent years in February 2017, to discuss the 2017/18/19 programme, to prioritise 'hot topics' of shared interest and to explore strategic issues such as external engagement and future funding. The ShARE group has used its collaborative network to share, connect and invite interested staff from the agencies to input to and receive outputs from each of the agencies planned research/evidence programmes. In addition, the ShARE project held six bi-monthly telephone meetings.

Action No. 6.9	Explore future joint funding opportunities with Northern Ireland (see also Action 6.10a)
Description	**Consider mechanisms under research infrastructure, research cooperation and researcher exchange**
Status	Initiated
Implementation Date	2016-2020

Lead Responsibility	SFI/DAFM
Progress Update	**DAFM** has a number of research cooperation mechanisms in place with the Department of Agriculture, Environment and Rural Affairs (DAERA). DAERA collaborated with DAFM on DAFM's most recent Research Call which resulted in co-funding in 8 of the successful projects.

Action No. 6.10a APJ 2017 No. 94	Deepen collaboration through the US-Ireland R&D Partnership
Description	a. Expand remit of Partnership in areas of mutual interest to US, Ireland and NI.
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	**DBEI**, ITI
Progress Update	The US-Ireland R&D Partnership is a product of the peace process and involves the governments of the USA, Ireland and Northern Ireland working together to advance scientific progress by awarding grants for research on a competitive basis. Areas funded include health, telecommunications, energy and (most recently) agriculture. A Steering Group co-chaired by the three jurisdictions guides the collaboration across the three administrations with secretariat support from InterTrade Ireland. The Partnership's momentum has been growing in recent years. To May 2017, 36 projects have been awarded a total of €61.1m (£53m or $64.45m) from a combination of sources but with equal contributions from the US and Ireland North and South. The Steering Group met in March 2017 in Washington, the next meeting will be held in Belfast in April 2018.

The **HRB** and **SFI** have co-funded a number of awards under the US-Ireland partnership and negotiated expansion of the remit of this programme to include the full range of health topics in 2016.

SFI announced three new Centre to Centre awards (SFI investment €2.5m) in November 2016 under the US-Ireland R&D Partnership programme between SFI the National Science Foundation in the US and the Department for the Economy in Northern Ireland. The three new collaborations are focused on making innovative discoveries and advances relating to renewable energy, new memory cells for electronic devices and biodegradable orthopaedic devices.

In 2016 **DAFM** and DAERA participated, on a pilot basis in the US-Ireland R&D Partnership Call in Agriculture with scope limited to three thematic areas – one tri-jurisdictional projects has been approved for funding under this programme in 2017. A new US-Ireland Call in Agriculture involving DAFM and DAERA in the same thematic areas as the previous year was launched in April 2017. DAFM is positively disposed to widening the scope of US-Ireland research to other agri-food thematic areas and has been in contact with, Inter-Trade Ireland, NI and US counterparts to progress this.

In other US-Ireland projects, the **EPA** has continued its collaboration with the Fulbright Commission and awarded two Fulbright-EPA awards in 2017. |

Action No. 6.11 APJ 2017 No. 94 	**Develop follow up initiatives to the ISCA programme**
Description	**Develop funding partnerships with international funders in countries such as China, Brazil, India and Japan to support international collaborative research projects.**
Status	**Initiated**
Implementation Date	2016-2020
Lead Responsibility	**SFI**
Progress Update	Following a press announcement in Q4 2016, SFI launched a call for proposals under a new funding partnership between Science Foundation Ireland and the National Natural Science Foundation of China (NSFC), with up to €2 million available per project awarded. This initiative will support collaborative research projects between researchers in Ireland and the People's Republic of China.

Action No. 6.12 APJ 2017 No. 94 	**Initiate negotiations with CERN for Ireland's membership options**
Description	Enter discussions with CERN
Status	**Ongoing**
Implementation Date	2016
Lead Responsibility	**DBEI**
Progress Update	In January 2016, the then Minister for Skills, Research and Innovation, Damien English T.D, wrote to the DG of CERN to inform him of Ireland's intention to explore membership options. There has been regular contact between DBEI and CERN in the intervening period. Officials from DBEI, EI and SFI visited CERN (Geneva) in July 2016. The Director General of CERN visited DBEI in October, and met with Minister Mitchell O'Connor. The key issue is the annual cost of full membership. The case for membership is being considered by DBEI as part of the Mid-Term Review of the Capital Plan, in the context of other research and innovation priorities.

Action No. 6.13 	**Initiate negotiations with ESO for Ireland's membership options**
Description	Enter discussions with ESO.
Status	**Initiated**
Implementation Date	2018
Lead Responsibility	**DBEI**

Progress Update	In January 2016, the then Minister for Skills, Research and Innovation, Damien English T.D, wrote to the DG of ESO to inform him of Ireland's intention to explore membership options. There has been regular contact between DBEI and ESO in the intervening period. Officials from DBEI, EI and SFI visited ESO (Munich) in July 2016. The Director General of ESO visited DBEI in September 2016 and met with Minister Halligan in November 2016. The key issue is the annual cost of membership. The cost of Membership of ESO would be approx. €3m/year. In addition, there is a once-off joining fee of €14m, which could be amortised over 10 years. The case for membership is being considered by DBEI as part of the Mid-Term Review of the Capital Plan, in the context of other research and innovation priorities.

Action No. 6.14	Initiate membership application for full membership of ELIXIR
Description	Observer status secured in 2015. Undertake process to progress to full membership.
Status	Complete
Implementation Date	2016
Lead Responsibility	DBEI
Progress Update	On 29th July 2016 Ireland secured full membership of ELIXIR, the international research organisation for the Life Sciences, becoming its 19th member.

Innovation Implementation

Action No. 7.3	Implement, monitor and build on the Irish National Policy on Ensuring Integrity in Research
Description	a. Develop and implement nationally harmonised best practice guidelines, training curricula, grant conditions, and processes for handling research misconduct. b. Agree a process and format for the publication of the outcome of research integrity investigations having regard to existing regulations relating to misconduct and discipline. c. Consider expanding and extending SFI pilot audits to all funders i.e. national shared audit scheme.
Status	**Ongoing**
Implementation Date	2016-2020
Lead Responsibility	Research Integrity Forum, research funders and performers
Progress Update	**a. Develop and implement nationally harmonised best practice guidelines, training curricula, grant conditions, and processes for handling research misconduct.** ○ The Forum has agreed two position papers on 1) the role and responsibilities of the Research Integrity Officer and 2) overlap between research ethics and integrity. The latter paper adopts the international viewpoint that research ethics is a subset of research integrity and makes a clear statement that institutional ethics committees should not be tasked with investigating allegations of research misconduct. ○ The Forum has agreed a set of Guidelines for the Investigation of Misconduct in Research. The Guidelines are based on international good practice and the experience of some of the Forum members in investigating cases, and is intended to support all research performing organisations in putting in place appropriate investigative processes. It is a "living document" which will be updated as required. ○ The Forum has negotiated a substantial discount with the world-leading provider of online research integrity training, which would provide a minimum baseline training for research students and research-active staff. The cost of putting this training in place is a key issue, and the Forum will shortly engage with the research funders regarding provision of funding for a three-year pilot to kick-start training provision in the research performing organisations. ○ In December 2016, the Forum submitted feedback to ALLEA on the draft revised European Code of Conduct for Research Integrity. The revised version was published in April 2017, and the Forum will now examine if the revised Code will require an update of the National Policy Statement on Ensuring Research Integrity in Ireland. ○ The Forum is continuing to work with other stakeholders, including the National Open Research Forum, on the important issue of storage of research data. **b. Agree a process and format for the publication of the outcome of research integrity investigations having regard to existing regulations relating to misconduct and discipline.** The Forum has agreed on a process and format for the publication of the

outcome of research integrity investigations. Each research performing organisation will report in confidence to the IUA on an annual basis. A consolidated report for all RPOs will be published annually on the IUA Research Integrity website. The first data gathering exercise will commence in June 2017 with a view to publishing the first report in September 2017.

c. **Consider expanding and extending SFI pilot audits to all funders i.e. national shared audit scheme.**
The Forum sub-group of research funders provides a forum for them to discuss and explore shared initiatives including a set of standard research integrity clauses to be included in contracts/call documentation and the potential for shared audits. The key priority for now is achieving a shared viewpoint in terms of the role of the funders in supporting the research community and RPOs in ensuring the highest standards of conduct of research.

Additional progress:

o The inaugural seminar of the National Forum on Research Integrity was held in the Royal Irish Academy in February 2017, and attracted over 130 delegates from across a wide range of roles in Higher Education Institutions, Government Departments and Agencies. The seminar explored the topic of Responsible Research and Innovation from a national and international viewpoint, focusing on how to establish and maintain a culture of responsible conduct of research. The morning session focused on the international viewpoint with two high-profile international speakers addressing the delegates. The afternoon moved to the national context, including several "dilemma pitches" from researchers touching on relevant issues from authorship to poor use of statistics, and closed with a lively panel discussion with strong engagement from the audience. The event report will be published and circulated by the end of May 2017.

o Several of the research performing organisations are members of the UK Research Integrity Office, a non-profit which provides valuable training and advice on research integrity to organisations. Representatives from DCU, UCC and UCD attended the UK RIO annual conference in May 2016.

o The Forum held a very successful peer-engagement seminar for Research Integrity Officers from the research performing organisations in February 2017. The facilitator on the day was Mr. James Parry, Chief Executive of the UK Research Integrity Office.

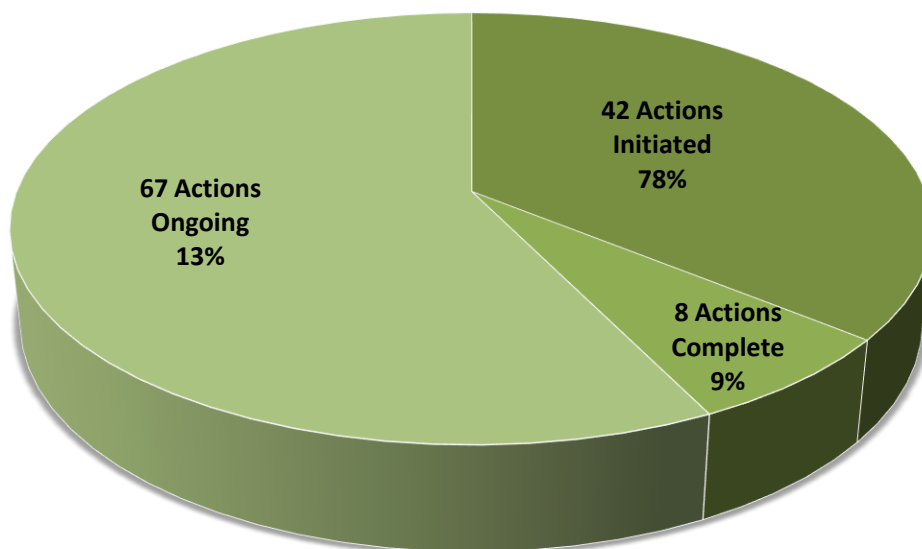| Action No. 7.4 European Research Area	Report to Cabinet Committee on progress implementing the strategy
Description	The Innovation 2020 Implementation Group will report annually to the Cabinet Committee on implementation of the strategy, including on progress on levels of investment necessary to reach the 2.5% target
Status	Ongoing
Implementation Date	2016-2020
Lead Responsibility	Innovation 2020 Implementation Group (DBEI to coordinate)
Progress Update	The first Innovation 2020 Progress Report was brought to Cabinet on 19th July 2016

and published on 20th July 2016. This second report will be brought to Cabinet in July 2017 and published thereafter.

Action No. 7.6	Standardised classification of public investment in research
Description	a. Drive the development of a standardised categorisation scheme for tracking public investment in R&D based on an internationally recognised system. b. Adopt the standardised categorisation scheme for tracking public investment in R&D. c. Explore the possibility of identifying a set of national Key Performance Indicators to measure the impact of RDI investment, with associated targets to stretch the performance of the system.
Status	Initiated
Implementation Date	2017
Lead Responsibility	a. Innovation 2020 Implementation Group b. All research funders c. All research funders
Progress Update	The Classification of Investment in Research Group, comprising representatives of the departments and agencies directly funding research, has been established and has held its first meeting. A number of follow-up, bilateral meetings have also taken place. A proposal has been developed to base the Irish classification on the Australian and New Zealand Standard Research Classification (ANZSRC). The **HRB** is a member of the National Classification Working Group, and has worked with DBEI to identify an appropriate international classification system that can be adapted to the Irish setting. The HRB initiated a project to map national health research investment against the Health Research Classification System (HRCS) – data has now been collected from all agencies, and a report will be published later in 2017. The **EPA** has developed a set of Indicators to monitor throughout the research cycle (from Research Inputs to Impacts). These will be finalised in the coming months and implemented/reported on via the EPA's online Grant Application & Project Management System.

Annex 1 - Breakdown of Progress on Actions

Innovation 2020 comprises 139 actions (which includes headline actions and their sub-actions).

In 2017, 72 actions were ongoing from the last progress report and 45 new actions were initiated. Of these, eight actions are now complete (five from ongoing actions and three from initiated actions). A summary of progress is illustrated in the chart below.

Innovation 2020 summary of progress 2017

42 Actions Initiated 78%

67 Actions Ongoing 13%

8 Actions Complete 9%

Annex 2 – Glossary

DAFM - Department of Agriculture, Food & Marine

DCCAE - Department of Communications, Climate Action and Environment

DES - Department of Education & Skills

DoF - Department of Finance

DBEI - Department of Business, Enterprise and Innovation

EI - Enterprise Ireland

EPA - Environmental Protection Agency

ERA - European Research Area

ERC - European Research Council

GSI - Geological Survey Ireland

HEA - Higher Education Authority

HEI - Higher Education Institute

HRB - Health Research Board

IDA - Industrial Development Agency

IDR – Interdisciplinary Research

IRC - Irish Research Council

IUA - Irish Universities Association

KTI - Knowledge Transfer Ireland

MI - Marine Institute

PRTLI - Programme for Research in Third Level Institutions

RPO - Research Performing Organisation

SEAI - Sustainable Energy Authority of Ireland

SFI - Science Foundation Ireland