



Rialtas na hÉireann
Government of Ireland



Innovation 2020

Third Progress Report

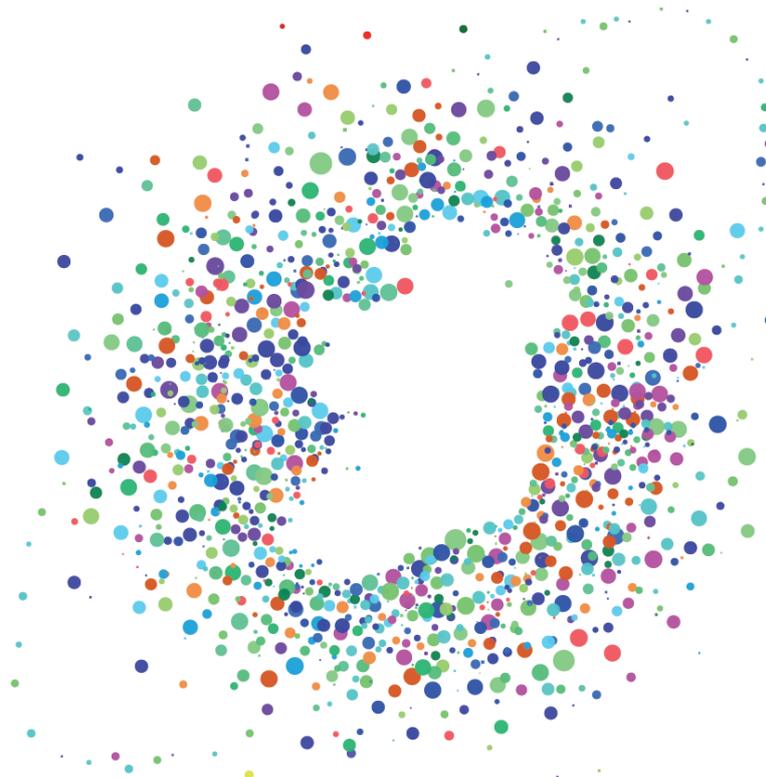
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INNOVATION

2020

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Introduction

Innovation 2020, Ireland's whole of Government Strategy for Research and Development, Science and Technology, driven by the Department of Business, Enterprise and Innovation, has now reached the midway point from its launch in December 2015.

The Strategy sets out Ireland's vision to be a Global Innovation Leader (GIL) by 2020 through a combination of prioritising public and private investment in Research, Development and Innovation (RDI), enhancing the impact of RDI for enterprise and addressing human capital challenges to deliver on our RDI ambitions.

This third Innovation 2020 Progress Report, prepared by the Innovation 2020 Implementation Group, outlines the advances made on delivering on the 140 strategic actions in Innovation 2020 in the 12-month period to June 2018. Many of these actions will be delivered over the course of the Strategy and beyond. 108 actions have been initiated or are ongoing, 18 actions have now been completed, 9 actions are experiencing delays and just 3 actions are yet to be initiated.

In the past year, there have been three meetings of the Innovation 2020 Implementation Group covering a variety of discussions and updates on topics such as research integrity, gender equality, young researchers, the SEAI strategy and the work of the National Open Research Forum. A key achievement in the past twelve months has been the Research Prioritisation refresh, an extensive consultation process which revised the research priority areas for the majority of competitively awarded public investment in research, resulting in a set of priorities that reflect both key societal challenges to be addressed and relevant market opportunities for Ireland.

The vision in Innovation 2020 for Ireland to become a GIL continues to be the central goal of the Strategy. In the recent publication of the European Innovation Scoreboard 2018 (EIS), Ireland remains a Strong Innovator and has moved up a place to 9th in the EU which is welcome news. Ireland placed first in three out of the ten dimensions considered by the EIS. Ireland leads in terms of innovative SMEs and employment in knowledge-intensive activities, as in 2017. Ireland also tops the leader board this year for sales impact, in particular new to market and new to firm sales.

The key Innovation 2020 commitment to increase public and private investment in RDI to 2.5% of GNP by 2020 is challenging. Since the publication of the Strategy in 2015, direct Exchequer funding of RDI has increased from €736m in 2015 to an estimated €768m in 2017. However, while the value of investment has increased this does not translate into an increase in the RDI intensity rate as a percentage of GNP. Since 2015, GNP growth rates have increased at a faster pace than our national investment in RDI.

An interim review of Innovation 2020 has been commenced which will provide the opportunity to acknowledge what has been achieved under Innovation 2020 since December 2015, highlight potential issues and inform the development of its successor.

This year's Progress Report highlights the great work being done in RDI in Ireland, but it is only through sustained increases in RDI investment that we can continue to build on this progress. The results of the EIS demonstrate that Ireland delivers excellent value for money in this area. However, the rapidly changing technological landscape and uncertain socio-economic environment demands that we prioritise public investment in RDI in order to continue to support our researchers and innovators, further develop our research infrastructure, ensure the Irish enterprise base optimises its potential and reach for our goal of becoming a Global Innovation Leader.

Ireland as a Global Innovation Leader

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| Action No. 1.1 | Move Ireland upwards in EU and global rankings towards becoming a Global Innovation Leader (GIL) |
| Description | Commit to continued and increased investment in people, infrastructure, and associated facilities to build the education and research base; and support the enterprise and public sectors to build their capacity for research and development. |
| Status | Ongoing |
| Implementation Date | 2020 |
| Lead Responsibility | Government |
| Progress Update | <p>As stated in the introduction, the vision in Innovation 2020 for Ireland to become a GIL continues to be the central goal of the Strategy.</p> <p>The annual European Innovation Scoreboard (EIS) provides a comparative assessment of the research and innovation performance of the EU Member States and selected third countries. In the 2018 EIS, launched in June, Ireland's innovation performance has improved with Ireland moving up one place to 9th overall in the EU which is welcome news.</p> <p>Ireland is once again identified as a "Strong Innovator", just behind Germany and Belgium and ahead of Austria, France and Slovenia in this category. Ireland has performed particularly well across a number of EIS indicators, placing first in three out of the ten "innovation dimensions": Innovators, Employment impacts and Sales impacts. Ireland does not fare so well on the public investment in R&D and the intellectual assets indicators.</p> <p>It is important that in order to reach our goal of joining the ranks of innovation leaders, we will need to continue to prioritise investment in RDI. A key feature of the EU Innovation Leaders, in particular the top four – Sweden, Denmark, Finland and the Netherlands – is significant levels of public and private investment in RDI.</p> <p>Ireland has also retained its position in the Global Innovation Index 2018, ranking 10th out of 126 countries assessed.</p> |

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| Action No. 1.2 | Reach R&D intensity target of 2.5% of GNP by 2020 | | | |
| Description | a. Increase Gross Expenditure on R&D (GERD) to 2.5% of GNP by 2020 by: Increasing public investment in our research base; Increasing investment in programmes that support enterprise RDI and improve leverage of private investment; Promoting tax-based initiatives to conduct research in Ireland and embed its commercialisation in Ireland b. Increase the number of significant enterprise R&D performers by 15% to 1,200 and the number of large performers from 170 to 200 c. Double private funding of publicly performed R&D to €48m per annum d. Secure €1.25bn from Horizon 2020 | | | |
| Status | a. Ongoing | b. Ongoing | c. Ongoing | d. Ongoing |
| Implementation Date | 2020 | | | |
| Lead Responsibility | a. Industry and Government b. All research funders and industry c. SFI, EI, IDA, HEIs and all relevant research funders d. Horizon 2020 National Support Network, HEIs and industry | | | |
| Progress Update | <p>a. Under the Europe 2020 Strategy, and as committed to by Government in our National Reform Programme in 2011 with a recommitment in Innovation 2020, Ireland's research target is to raise combined public and private investment in RDI to 2.5% of GNP by 2020. Gross expenditure on Innovation, Research and Development (GERD) consists of both public and private expenditure. In 2016, GERD reached over €3.2 billion, almost €700,000 more than in 2011. The estimated expenditure on RDI by Government Departments in 2017 is €768 million. This represents an increase of almost €40 million over 2016 and is the highest level of public expenditure on RDI since 2012.</p> <p>A very significant part of Ireland's innovation policy has been to align public investment efforts in a manner that leverages RDI activity in the enterprise sectors. While private spending on RDI slowed during the financial crisis, it has been increasing steadily since 2011. Business Expenditure on Research and Development (BERD) rose to €2.3 billion in 2016 from €1.7 billion in 2011, an increase of over 35%.</p> <p>Despite the fact that overall expenditure on RDI has increased every year since committing to Europe 2020 targets, reaching the 2.5% of GNP intensity rate target within the timeframe set presents a very significant challenge, in particular due to the fact that GNP growth rates have increased and are forecast to continue to increase at a faster pace than our national investment in RDI.</p> <p>In 2016 our GNP intensity level stood at 1.43%, down from 1.91% in 2012. Even when using GNI* as a complementary indicator (GNI* removes globalisation impacts on the Irish economy), the RDI intensity rate is estimated at 1.72% for 2016.</p> <p>b. The most recent available figures (BERD 2015) for R&D-performing enterprises show that Ireland is on target to reach both the goal of 1,200 significant enterprises R&D performers (where spend is over €100,000 on RDI) with 1,184 in this category, up from 1,040 in 2014</p> | | | |

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| | <p>and the goal of 200 large R&D performers (where spend is over €2m on RDI), with 184 in this category, up from 170 in 2014.</p> <p>However, the most recent Innovation in Irish Enterprises survey shows that we have not made any progress towards meeting the innovation active target of 73% of enterprises, with 57% of all Irish enterprises of over 10 employees consider themselves R&D active in 2016, down from 61% in 2014.</p> <p>c. The most recent available figures (HERD 2015) for private funding of RDI in the higher education sector show that Ireland is on target to meet the goal of doubling funding to €48 million by 2020 with 31.2 million spent in 2014.</p> <p>d. A key target in Innovation 2020 is to secure €1.25bn from the current EU Framework Programme for RDI, Horizon 2020. Ireland has won €513 million from 2014 to February 2018 in competitive funding from Horizon 2020 which is equivalent to 1.67% of the total budget committed to date. This is marginally ahead of our target of 1.56%.</p> |
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Innovation in Enterprise

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| Action No. 2.1 | Research Prioritisation (RP) as basis for research investment in support of enterprise (see also Action 2.3, New cycle of Research Prioritisation) | |
| 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 | a. Ongoing | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | DBEI, EI, IDA, SFI, DAFM, MI, Teagasc, IRC, DCCAIE, SEAI, GSI, other research funders | |
| Progress Update | <p>As detailed under Action 2.3, the revised Research Prioritisation themes and priority areas were published in March 2018. This is reflected in the information provided by research funders set out below.</p> <p>a. Practically all of the research invited in DAFM's 2017 Research Call (results to be announced in late Q2 2018) under its three competitive research funding programmes (FIRM, Stimulus & CoFoRD) are related to the areas identified under RP.</p> <p>In addition to the 2018 EPA Green Enterprise Call which will be targeted to the Circular Economy, the 2018 EPA Research Calls include topics relevant to the RP areas.</p> <p>GSI has established funding for geothermal energy and minerals/raw materials/material recycling sectors, which ties into the refreshed Energy, Climate Action and Sustainability theme.</p> <p>IDA Ireland continues to promote Horizon 2020 and other competitively awarded research investment to its clients. IDA Ireland targets investments in the priority areas and tracks each R&D investment according to its alignment with one or more of the areas.</p> <p>IRC's 2018 Employment Based Programme recently closed (evaluation now underway) and the Enterprise Partnership 2018 Call for postgraduates and postdocs will open end Q2 / early Q3. The programmes are open to researchers in all disciplines however the RP areas would feature prominently in the awards.</p> <p>MI's Marine Research Programme funds competitive calls for research activities that address the objectives of national strategies and plans, including Innovation 2020 and are aligned with the national research priority areas. Applicants are required to demonstrate the national strategic relevance of the proposed research as part of the evaluation process.</p> <p>SEAI investment in research in areas identified by the Research Prioritisation Exercise is primarily provided via the SEAI Research, Development & Demonstration Funding Programme (for all</p> | |

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| | <p>prioritisation areas which are relevant to the energy/low carbon sectors) and the SEAI Ocean Energy Prototype Development Fund (for the Marine Renewable Energy prioritisation area).</p> <p>SFI is adjusting its programmes and systems to implement the newly released Research Priority areas. SFI is also undertaking a review of the categorisation of its portfolio of live awards against the 14 Refreshed Priority Areas.</p> <p>Teagasc report that all Walsh Fellowships funded in 2018 are aligned with the Research Prioritisation areas Food for Health; Smart and Sustainable Food Production and Processing.</p> <p>b. DBEI revised the priority areas to ensure that Ireland is favourably positioned to benefit from global opportunities now and into the future, by responding to worldwide megatrends and challenges that are shaping the global economy and Ireland’s place in it.</p> |
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| Action No. 2.2 APJ 2018 No. 49 | Within the current cycle of RP, stimulate public research on Services and Business Processes and Manufacturing Competitiveness | |
| Description  | <p>a. Increase capacity in the higher education sector by appointing a number of ‘star’ researchers with proven track records of solutions-driven research in <i>Services and Business Processes and Manufacturing Competitiveness</i>, in collaboration with global leaders in enterprise.</p> <p>b. Incorporate enterprise-relevant <i>services and business processes</i> challenges in the proposed new challenge-based funding system (see Action 4.3).</p> | |
| Status | a. Ongoing | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | <p>a. HEIs, SFI</p> <p>b. SFI, IRC</p> | |
| Progress Update | <p>a. The HEA’s foundation investment supports public research excellence across all disciplines by:</p> <ul style="list-style-type: none"> • Putting central research support infrastructure in place; • Offering permanent tenure to key PIs; • Facilitating academic staff engagement in research activities. <p>In order to develop research capability in key areas like <i>Services & Business Processes and Manufacturing Competitiveness</i>, the institutions require this foundation HEA investment which can then be used to attract competitive funding for prioritised areas.</p> <p>IRC’s policy-orientated research funding call, which will open in Q2 2018, will invite proposals for excellent research in a broad range of policy areas, including enterprise-related policy.</p> <p>SFI has recently approved a Research Professorship award to World Leading Economic Geologist Prof. Murray Hitzman (UCD), who has been hired as Professor of Economic Geology and is now the Director of the iCrag Research Centre. His career in economic geology has researched and exploited minerals, natural materials and resources. His appointment promotes and assists the security and</p> | |

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| | <p>discovery of the raw materials needed for almost all forms of manufacturing, building and ICT infrastructure.</p> <p>b. As a first phase in SFI's approach to challenge-based funding, SFI is working with the American Chamber of Commerce in Ireland to define visionary, STEM-led challenges that will foster collaboration between public and private sectors, and harness Ireland's innovation capabilities.</p> |
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| Action No. 2.3 APJ 2018 No. 50 | Put in place new cycle of Research Prioritisation |
| <p>Description</p>  | <p>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.</p> |
| Status | Completed 2018 |
| Implementation Date | 2018 |
| Lead Responsibility | DBEI, research funders, enterprise development agencies, key stakeholders |
| Progress Update | <p>DBEI conducted a rigorous exercise including extensive consultation to develop the evidence base to inform the refresh of Research Prioritisation exercise. While the evidence demonstrated that for many of the priority areas, the focus remains as relevant in 2018 as it was for the 2012 – 2017 cycle, there have been several revisions and updates to both the themes and the priority areas to reflect changing circumstances in that period.</p> <ul style="list-style-type: none"> • The ICT priority areas have been broadened to reflect the changes in technology since 2012 and now include Robotics, Artificial Intelligence (including Machine Learning), Augmented Reality and Virtual Reality. • With the focus on preventive health measures and the increasing emphasis on well-being, which is evident across all the health-related priority areas, the Health theme has been evolved to reflect these drivers and is renamed Health and Well-being. • The Sustainable Food Production and Processing priority area is broadened to reflect the evolution in technology since 2012 and the key emerging priorities in the EU initiative Food 2030, particularly the need for climate smart and environmentally sustainable food systems and the need for circularity and resources efficiency of food systems and is renamed Smart and Sustainable Food Production and Processing. • The most significant changes have been to the Energy theme. Based on developments since 2012, including the increased urgency to address climate change and sustainability challenges, alongside the increased opportunities for enterprise within this wider context, the Research Priority theme has evolved to reflect these drivers and is renamed Energy, Climate Action and Sustainability, and the two priority areas have been updated to Decarbonising the Energy System; and Sustainable Living. |

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| | <ul style="list-style-type: none"> To reflect the impact of technological change and the digitisation of manufacturing since 2012, the Manufacturing Competitiveness priority area is renamed Advanced and Smart Manufacturing (which will also include Processing Technologies) and Processing Technologies and Novel Materials is renamed Manufacturing and Novel Materials, acknowledging that Novel Materials underpin and enable other priority areas, presenting particular challenges for the manufacturing sector. The services sector in Ireland is a major part of Ireland’s economy and is increasingly participating in innovative activities and the Innovation in Services and Business Processes research priority remains unchanged. <p>The resulting report, “Research Priority Areas 2018 to 2023” was agreed by Government and published in March 2018. Implementation of the report will be driven through the Innovation 2020 Implementation Group. The revised priority areas will be of particular relevance in the context of the new €500 million Disruptive Technologies Innovation Fund announced by the Government as part of the National Development Plan 2018-2027.</p> |
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| <p>Action No. 2.4 APJ 2018 No. 52</p> | <p>Optimising Enterprise RDI Supports</p> | | |
| <p>Description</p>  | <p>a. 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 firms. The review will also assess the incentives available internationally to ensure that Ireland’s offering remains competitive.</p> <p>b. We will review and streamline enterprise RDI support programmes across departments and agencies to ensure their comprehensiveness and complementarity.</p> <p>c. We will explore how to increase the private investment that is leveraged by these RDI support programmes – that is, we will seek to increase the multiplier effect of public investment in these programmes.</p> | | |
| <p>Status</p> | <p>a. Nearly complete</p> | <p>b. Ongoing</p> | <p>c. Ongoing</p> |
| <p>Implementation Date</p> | <p>2017</p> | | |
| <p>Lead Responsibility</p> | <p>DBEI (SPD), EI, IDA Ireland, other relevant funders</p> | | |
| <p>Progress Update</p> | <p>a. DBEI commissioned Indecon Economic Consultants to review the RD&I Supports available to businesses and provide policy recommendations to achieve the high-level goal of increasing business expenditure on R&D (BERD) and to identify if there are opportunities to streamline, strengthen or introduce new supports that respond to the needs of SMEs and larger companies in Ireland. It is expected that the report will be published shortly and DBEI will work with the relevant funding agencies to respond to the recommendations.</p> <p>b. The Government’s RD&I support programmes are reviewed, updated and adapted on a continuous basis. Recent changes to ensure that programmes remain aligned to enterprise needs include the introduction of a new Agile Innovation Fund by Enterprise Ireland</p> | | |

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| | <p>(fast-track process for R&D supports), the development of a new Business Innovation Initiative and the further scaling up of a Small Business Innovation Research (SBIR) programme also by EI. The announcement by the Government, in the context of the recently published NDP, of a new €500 million Disruptive Technologies Innovation Fund (DTIF) to be implemented through DBEI and its agencies will provide a significant new instrument to support game changing innovations across the enterprise sector, working in close collaboration with higher education institutions and the public research system.</p> <p>The new instruments, together with continuous adaptation of existing programmes, will address many of the recommendations in the Indecon study (referenced at a. above). They will address reported gaps in the RD&I support system for SMEs in particular and providing a major new instrument (through the DTIF) to drive collaboration between large enterprises, SMEs and other RD&I performers in Ireland.</p> <p>c. In its 5-year strategy, IDA Ireland has set out clear targets to increase research investment, both in terms of new performers and scale of R&D investment.</p> |
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| 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 | Nearly complete |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI, EI/Knowledge Transfer Ireland, IDA, SFI, IRC, other stakeholders |
| Progress Update | <p>DBEI is working with KTI on a web-based directory of innovation supports available to industry. DBEI has begun the process of updating the 2016 Directory in hard copy and is collating new content from both old and new contributors. DBEI will liaise with KTI to ensure consistency of content across both mediums.</p> <p>KTI has promoted its resources and the benefits of engaging with the research base at a number of national and regional events as part of its ongoing activities.</p> <p>SFI continue to regularly update KTI for their Directory of Research Centres and Gateways.</p> <p>IRC continues to update DBEI/KTI for the Directory of RDI supports. In addition, IRC continues to promote its enterprise-facing programmes at sectoral and regional events.</p> |

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| Action No. 2.6 APJ 2018 No. 49, 53 | Optimise network of technology and research centres | | | | |
| Description  | <p>a. The network of <i>Technology Centres</i> 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.</p> <p>b. The network of Technology Gateways will be strengthened to ensure good geographical and technological coverage and to maximise enterprise engagement.</p> <p>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.</p> <p>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.</p> <p>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.</p> | | | | |
| Status | a. Ongoing | b. Ongoing | c. Ongoing | d. Ongoing | e. Completed 2017 |
| Implementation Date | <p>a. 2016 – 2020</p> <p>b. 2016 – 2020</p> <p>c. 2016 – 2020</p> <p>d. 2016 – 2020</p> <p>e. 2016</p> | | | | |
| Lead Responsibility | <p>a. EI, IDA, DES, HEA, HEIs</p> <p>b. EI, DES/HEA</p> <p>c. SFI, DES/HEA</p> <p>d. IDA, EI, SFI, HEIs</p> <p>e. EI, IDA, SFI, HEIs</p> | | | | |
| Progress Update | <p>a. The Technology Centres are subject to ongoing reviews to ensure each individual centre continues to represent the Technology Centre model and requirements. Currently there are 3 Centres under review, the outcomes of which will be submitted and considered by Enterprise Ireland Board in the coming months.</p> <p>b. In November 2017 the Board of EI approved funding contracts for 15 Technology Gateways to run over the 5-year period 2018-2022. The Technology Gateway Network was formally launched in May 2018. Previous reports outlined two new clusters (Applied Internet of Things Cluster and an Engineering, Materials and Design Cluster). The Irish Food Tech Cluster was launched in May 2018 and is a consortium of 7 Technology Gateways operating within the food and beverage technology sector. The cluster provides a range of expertise for companies who want to access research and development within these areas. The cluster can connect industry with researchers in a wide selection of areas that include bioprocessing, food for health, process control and packaging amongst many others.</p> <p>c. SFI has made significant progress on this action. Four new Research Centres, two of which are in the area of advanced manufacturing, commenced operations in late 2017. Funding of a fifth “Agri-Food”</p> | | | | |

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| | <p>Centre was approved in Q4 2017 involving a contribution of €5 million from DAFM, bringing the total number of Research Centres to 17. This Agri-Food Centre represents a unique collaboration between Agri-Food and ICT research institutes as well as leading Irish/multinational food and ICT companies with a focus on innovation and enhanced sustainability across the dairy supply chain. These five new Research Centres were funded by an investment of €100 million from SFI in addition to €54 million from enterprise.</p> <p>d. EI continues to be actively engaged with IDA Ireland and DBEI to further strengthen the existing manufacturing RTO Irish Manufacturing Research and are working to secure additional funding for the necessary capital equipment in additive manufacturing equipment and pilot automation lines. Capital equipment funding is part of wider discussions with DBEI and other agencies (IDA Ireland & SFI) on the make-up of the research infrastructure for advanced manufacturing nationwide.</p> <p>SFI announced the co-funding with Fraunhofer-Gesellschaft of the first Fraunhofer Project Centre to be established in Ireland. The Fraunhofer Project Centre for Embedded Bioanalytical Systems "FPC@DCU" is an advanced manufacturing centre supporting the development of microfluidics-based solutions for decentralised bioanalytical testing.</p> <p>e. Refer to Second Progress Report</p> |
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| Action No. 2.7 | Promote Ireland as a test-bed for innovative technologies and therapies | |
| Description | <p>a. A number of pilot test-beds will be established in conjunction with relevant research and technology centres operating at the higher TRLs, with Government and development agency support.</p> <p>b. Transparent protocols will be developed to facilitate and encourage enterprise access to the test-beds.</p> | |
| Status | a. Ongoing | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | Research funders, relevant Government departments, public bodies | |
| Progress Update | <p>a. EPA reports that this action will be of particular relevance to the transition to a low carbon and resource efficient economy and society. Ireland has the right scale to act as a test bed for innovative technologies that will assist with the transition, for example, scaling up the transition to electrified transport, the piloting and testing of low carbon energy solutions at rural, town and small city level and the incorporation of micro-generation of electricity into national grids. Research funded by the EPA through its national programme and European programmes in the areas of climate and sustainability can support this action as well as co-funding opportunities with other research funders.</p> <p>The HRB Clinical Research Co-ordination Ireland (HRB-CRCI) is coordinating 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</p> | |

established national Health Innovation Hub to act as a test-bed for healthcare innovation.

IDA Ireland works with a number of test bed initiatives such as Smart Dublin, Pervasive Nation and on new initiatives in this area. It encourages client participation and facilitate introductions and collaborative discussions in these areas.

MI in partnership with SmartBay Ireland continues to develop testbed facilities providing access to industry and the marine research community in Ireland to trial new technologies, particularly in the renewable ocean energy sector. The data collected at testbed facilities including the Galway Bay Sub Sea Cable Observatory is made available to researchers via Ireland's Digital Ocean, which is a website portal providing access to a diverse range of services including online maps, data dashboards, data access, data search and publications.

SFI announced 22 Research Infrastructure awards (SFI investment €35.6m) in 2016, and a further 36 Awards (SFI investment €54.2m) in 2017. Of these 58 awards, 17 of these have been identified as testbeds. Access charge plans are in place for these facilities, allowing industry users access to these facilities.

In February 2018, SFI launched another Research Infrastructure programme call. The deadline of the call has now passed and applications detailing testbed infrastructure have been received. The outcomes of this process will be read out before the end of the year.

The iMARL in-situ marine observation lab, the most ambitious deep-ocean research project ever undertaken in Europe and led by scientists from the Dublin Institute for Advanced Studies was launched in April 2018. The project received €2.9m in funding from **SFI** and additional support from **GSI**. <https://www.imarl.ie/>.

- b. All applicants to the **SFI** Research Infrastructure programme must submit a clear access charge plan to facilitate and encourage industry to access and use the infrastructure. The quality of the overall sustainability and management plan, including the access charge plan, is a key review criterion in the SFI review process.

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| 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 | <p>DAFM's 2017 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.</p> <p>The EPA primarily funds research projects following an open and competitive call and, where relevant, inter-disciplinary research is encouraged (reflecting the fact that to address environmental challenges, an integrated cross-sectoral approach is required). In 2017, the EPA reviewed and revised its Application Form including a requirement to demonstrate (where applicable) the inter-disciplinary of the research. 50% of the 2017 EPA awards indicated that the proposed research was multi / trans-disciplinary.</p> <p>GSI is funding projects that specifically fund interdisciplinary research for external researchers and new PhD programmes such as the iCRAG-GSI Environmental Geoscience programme that promotes interdisciplinary research. GSI is working directly with other disciplines as an example of how it can be achieved, ring-fencing external research funding specifically for interdisciplinary projects and in their more general calls they award additional marks in assessments if the proposed projects are interdisciplinary.</p> <p>Through its funding schemes the HRB continuously supports interdisciplinary research and the development and enhancement of capacity in this area. For example:</p> <ul style="list-style-type: none"> • The HRB provides 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) • The HRB's SPHeRE PhD Programme in Population Health Science and Health Services Research places a strong emphasis on inter- and multi-disciplinary in the training of future researchers. It is now in its second Phase of funding, valued at €2.5m for the period 2018-2024. • The HRB launched a new Collaborative Doctoral Awards in Patient Focused Research Scheme in 2017, and intends to award up to four CDA grants, with a combined value of up to €6m. The aim of this scheme is to develop the expertise to advance, apply and transfer knowledge from clinical research into clinical application. The CDAs will train health and social care professionals and health-related researchers from a variety of disciplines to doctoral level. • The HRB Collaborative Applied Research Grants (CARG) have a strong inter- and multi-disciplinary focus (commitment of almost €4.8m) |

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| | <p>IRC will open a new call (COALESCE) in 2018 inviting proposals for research with a public policy and societal impact focus, taking an interdisciplinary approach. Funding partners will include Irish Aid. IRC will also be issuing a Call for Proposals in 2018 for interdisciplinary networking workshops (Creative Connections). IRC will be further developing its enterprise-driven programmes to encourage interdisciplinary collaboration between enterprise and Arts, Humanities and Social Science disciplines. All Council funding programmes are open for interdisciplinary applications and these are encouraged.</p> <p>MI funding programmes strongly encourage inter-disciplinary research, and it is a key evaluation criterion in the peer evaluation process. MI's funding guidelines also allow project partners from Northern Ireland and overseas, which also helps to develop international multi-disciplinary research collaborations and provide broader opportunities for Irish marine researchers to participate e.g. in EU Horizon 2020 submissions.</p> <p>The SEAI RD&D Funding Programme carries out a wide-ranging stakeholder consultation exercise in order to define priorities for its calls. The last such exercise involved consultation with Government Departments and Agencies in the Energy, Environment, Agriculture, Transport, and Science sectors amongst others. Cross-Government/Agency co-funding partnerships are an active component of the SEAI RD&D Funding Programme.</p> <p>SFI's partnerships with other agencies incentivise interdisciplinary collaboration. In September 2017 a €43 million investment in 26 research projects through the SFI Investigators Programme was announced. Six of the research projects were interdisciplinary and funded in partnership with Teagasc, GSI, MI and EPA. An Investigators Programme call is planned for Q4 2018. Existing partners have been contacted and most have provisionally agreed to be involved again.</p> <p>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.</p> |
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| Action No. 2.9 | Promote entrepreneurship |
| Description | Progress the implementation of the actions in the <i>National Policy Statement on Entrepreneurship in Ireland</i> . |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI, DES, HEA |
| Progress Update | This will be a seminal 18-month project which will see a comprehensive review of the SME business ecosystem and policies, using OECD expertise in a structured and defined process. The resulting recommendations and issues identified by the report will then form the basis of a long term DBEI led SME Strategy for Ireland. |

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| | <p>The 2016 Annual progress report for the National Policy Statement on Entrepreneurship in Ireland (NPSE) was completed in Q1 2017. Of the 96 actions laid out under the NPSE, 60 have been completed as of the end of 2017 with the remainder ongoing in nature. During 2017, the NPSE Mid Term Review took place which included stakeholder meetings and feedback to assist the direction on the 2nd half of the Policy Statement in which specific focus was given to “underrepresented cohorts of entrepreneurship”.</p> <p>In April 2018, the OECD in collaboration with DBEI (and the wider Government) has commenced a “Review of SME and Entrepreneurship issues and policies in Ireland”.</p> <p>DES plans to publish an Entrepreneurship Policy Statement in 2018. It also plans to develop Entrepreneurship Education Guidelines for Schools, and will introduce a National Entrepreneurial Award for primary and post-primary schools, to encourage the development of entrepreneurial skills.</p> |
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| Action No. 2.10 | Access to finance |
| Description | Implement the ‘Finance for Growth’ actions in <i>Enterprise 2025</i> 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, DOF, EI |
| Progress Update | <p>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 2018) shows that 560 facilities with €88.8m in lending have been sanctioned, supporting the creation of 2,200 new jobs and 1,319 jobs being sustained. A Counter Guarantee Scheme was also put in place in 2017 which allows 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.</p> <p>Microfinance Ireland recently published its latest Quarterly Report (Q1 2018) showing that since its inception Microfinance Ireland has approved 1,663 loans and provided €23.9m in loan approvals, which supported 4,099 jobs. There was a strong regional spread with loans granted in all 26 counties with 79% of the loans provided to microenterprises outside Dublin.</p> <p>In relation to the Enterprise Ireland Seed and Venture Capital Scheme, in 2017 the Department of Jobs, Enterprise & Innovation commissioned 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</p> |

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| | <p>Evaluation was completed in Q2 2018, and its findings will inform the development of next tranche of the Scheme.</p> <p>The ‘Supporting SMEs’ online tool provides access to information on over 170 Government business supports across over 27 Departments, Agencies and initiatives. Work is underway on the development of a Business Finance Advisory Hub, which build on the Supporting SMEs tool to provide a suite of information and toolkits designed to assist businesses to make more informed financial decisions.</p> <p>Under Enterprise 2025 Renewed, the Brexit Loan Scheme was launched in March 2018. It is a €300 million loan fund available to eligible Irish businesses impacted by Brexit. Finance provided under the scheme is easier to access, more competitively priced (maximum interest rate is 4%), and offered at more favourable terms than other lending for such businesses. Loan amounts are offered of between €25,000 to €1.5m. Metrics on take up of the scheme will be reported on a quarterly basis from Q2 2018.</p> <p>DBEI, working with the DAFM and the DoF, is examining policy proposals for a new longer-term Investment Loan Scheme to support businesses to invest strategically for a post-Brexit environment.</p> |
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| Action No. 2.11 | Increase collaboration within the public research system | |
| Description | <p>a. Research funders will review their programmes to ensure that they incentivise and reward collaboration between researchers, institutions and centres.</p> <p>b. Clusters of research centres with complementary research agendas will be identified and incentivised to collaborate for greater overall impact.</p> | |
| Status | a. Ongoing | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | <p>a. All research funders</p> <p>b. Technology Ireland</p> | |
| Progress Update | <p>a. DAFM's 2017 Research 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.</p> <p>EI RDI Programmes such as Innovation Partnerships, Technology Centres and Technology Gateways continue to specifically target collaboration between industry and the third level sector. All EI RDI Programmes are also subject to regular and rigorous independent impact evaluations.</p> <p>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</p> | |

Process (National Overview) under the Capacity Development of Irish research community criteria. During the reporting period, 44% of the Medium- and Large-Scale projects awarded in 2017 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. In early 2018, the HEA completed a [comprehensive review](#) of the funding allocation model and its recommendations will now be rolled out on a phased basis. These recommendations include the doubling in scale of the university allocation on the basis of research and innovation performance and the introduction of a similar allocation for the IoTs for the first time. These allocations would be driven by a wider base of outcome metrics, including knowledge transfer indicators.

The **HRB** continues to sustain existing and develop new co-funding initiatives where appropriate. Recent examples include

- HRB partnerships with other funding agencies including SFI, DAFM, IRC, HSE, the Ireland-NI-US partnership, the SFI-HRB-Wellcome Trust Biomedical Research collaboration, Atlantic Philanthropies the Fulbright Foundation, the Irish Medical Research Charities (MRCG Co-fund Scheme) and the SPHeRE Network.
- 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 total of 20 co-funded awards, with a total value of €3.78m have been made to date.

IDA Ireland continues to encourage collaboration by clients. This is given due regard in its investment decision-making process. IDA Ireland clients are significant collaborators with SFI, Enterprise Ireland and other research programmes across the State.

IRC continues to promote collaboration between researchers and institutions through the structure of its funding calls, which allow costs for collaboration and conferences. The Council continues to grow and refine its New Foundations Networking and Knowledge Exchange programme, New Foundations, which is explicitly focused on encouraging interaction between researchers and their institutions, and also intersectoral collaboration, e.g. with civic society. The Council will be opening a 2018 New Foundations Call in Q3 2018.

GSI reports co-funding with the IRC to connect social scientists and geoscientists.

All **MI** research funding programmes place a strong emphasis on collaboration, Under the National Marine Research & Innovation Strategy 2017-2021 research priorities have been set to develop human capacity, infrastructures and networks & relationships to

increase the maturity levels of research under the 15 themes identified in the strategy. Co-funding arrangements between the national funders will also help to develop research clusters, and the MI is working with SFI, GSI, EPA, SEAI and Met Eireann in areas such as marine biotechnology, seabed mapping, climate change, ocean observation & modelling and ocean renewable energy to maximise the use of national research funding by creating national capacity in these prioritised research areas.

The **SEAI** RD&D Funding Programme is open to public sector organisations based in Ireland. Applications will be accepted from Companies, Research Performing Organisations (e.g. Universities, Institutes of Technology and Publicly Funded Research Institutions), Public Sector Bodies and Semi-State Bodies.

SFI's programmes incentivise and reward collaboration. These programmes include Research Centres, Investigators Programme, Spokes, and Strategic Partnerships.

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 (awards made in Sept 2017) required a collaboration between a Teagasc staff member and a non-Teagasc staff member (i.e., from another SFI-eligible institution). Teagasc and DAFM funded Irish involvement in 2 ERA-NETs, SusAn and ERA-GAS, which made awards in July and August 2017 respectively. These ERA-NETs required at least two Irish research performing organisations to be involved in the application.

- b. **SFI** fosters collaboration across Research Centres through direct engagement with Centres to inform them of the potential for collaboration with other centres, where relevant, and to also avoid duplication of activities. This is important in building an integrated, efficient and coherent Research Centre ecosystem. The SFI Spokes programme, which enables the addition of new industrial and academic partners and projects to SFI Research Centres, directly encourages collaboration across centres and with the broader academic system. Amongst the programme-level specific objectives are objectives to (1) allow new academic partners to join the Research Centre; and (2) to link existing Centres and other major grant holders. An example of this is the recently funded ENABLE spoke which includes 60 researchers in three SFI Research Centres; CONNECT, INSIGHT and LERO and aims to develop smart urban environments through the Internet of Things (IoT). Proposals for other multi-centre spokes are also currently being developed. The UK Engineering and Physical Sciences Research Council (EPSRC) and SFI have entered an agreement to support research applications involving collaborative teams led by researchers from the UK and Ireland. This UK-Ireland partnership has fostered the development of joint applications between multiple SFI Research Centres and UK-based Institutions to the EPSRC's Centres for Doctoral Training programme, another example of multi-centre collaboration.

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| Action No. 2.12 | Increase collaboration between firms and the public research system | | |
| Description | <p>a. Establish new enterprise liaison positions to promote collaboration between the enterprise sector and the public research system.</p> <p>b. Expand the <i>SFI Strategic Partnership and SFI Centres Spokes programme</i> for adding new industrial and academic partners to the SFI Research Centres.</p> <p>c. Increase the use of the EI Innovation Partnership scheme to drive market-led collaboration between firms and the public research system.</p> | | |
| Status | a. Ongoing | b. Ongoing | c. Ongoing |
| Implementation Date | 2016 – 2020 | | |
| Lead Responsibility | EI/Knowledge Transfer Ireland, SFI, HEIs, GSI | | |
| Progress Update | <p>a. KTI strategic plan 2018-2021, incorporating a modest investment in KTI for 3 FTE Connector posts to address the gap perceived and articulated by industry, was endorsed by the EI Board in September 2017. The official request for sanction of these posts to be submitted by EI HR to DBEI. Once sanctioned, the recruitment process will commence.</p> <p>b. SFI continues to make progress with the Strategic Partnership Programme, with a total investment to date of €30m in 14 unique partnerships which have leveraged €32.8m from industry, charity and philanthropic organisations. For example, a recently funded partnership project focuses on the development of drone technology to ensure that drones can operate safely and securely. The programme continues to be attractive to academics and their co-funding partners to support stand-alone initiatives of scale with strong potential for economic and societal impact for Ireland, with a number of applications currently under review. Funding for seven new Spokes into Research Centres was approved in late 2017, representing an investment of over €21 million which has leveraged industrial support in excess of €15 million and which is supporting key sectors of the Irish economy, such as ICT, food and energy.</p> <p>c. The Innovation Partnership programme is continuously promoted and communicated in order to drive collaboration between firms and the public research system. 85 companies were involved in Innovation Partnerships in 2017 – an all-time high. Some of these Innovation Partnerships were facilitated through Technology Gateways. To optimise the power of the Gateways network, three sector-specific clusters were established. Irish Food Tech, a cluster of seven Gateways which recently launched, caters for the food and beverage technology sector.</p> <p>In late 2017, GSI announced funding for several SMEs under the Short Call programme.</p> <p>The SEAI RD&D Funding Programme is open to public and private sector organisations based in Ireland (including Irish subsidiaries of overseas companies) who wish to carry out projects in Ireland.</p> | | |

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| Action No. 2.13 | Promote design-driven innovation |
| Description | Implement the Design Strategy ¹ to encourage more start-ups and SMEs to use design as a competitive differentiator, to develop the design sector in Ireland, and to promote Ireland's creative economy and design excellence as part of our enterprise and innovation culture. |
| Status | Initiated |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI, EI, DCCOI |
| Progress Update | <p>The National Design Forum was established in May 2017 as a result of the Year of Irish Design. The Forum brings together all relevant stakeholders, from the design sector, the business sector, the education sector and relevant Government Departments/agencies, in order to move forward with a comprehensive Design Strategy.</p> <p>The purpose of the Forum is to develop practical proposals around promoting design in enterprise. Key areas of consideration include: encouraging businesses to undertake design innovation; encouraging the design and enterprise sectors to work closely together to ensure that Ireland has the necessary skills for the future; and developing strategies to promote Irish design at home and abroad.</p> <p>The Forum has met 3 times as of May 2018, and is chaired by the Minister for Business, Enterprise and Innovation.</p> |

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| Action No. 2.14 | Promote standards and regulations as a source of competitive advantage |
| Description | Work with firms to stimulate and support the embedding of standards and regulatory compliance into their research and development processes. |
| Status | Initiated |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | NSAI |
| Progress Update | <p>To promote and support the embedding of standards into the R&D innovation processes of Irish companies, NSAI has appointed a number of new staff with extensive RDI experience in industry and in industry-academic RDI collaborations. NSAI have developed a new leaflet and website page on Standards Development and Research & Innovation "What are the Benefits" and has presented on this topic at various industry events nationwide over the past year, often in collaboration with EI and IDA Ireland.</p> <p>NSAI have established and operated new Standards committees in key emerging technology areas including: Additive Manufacturing / 3D printing, Robotics, Blockchain, Cyber Security & Data Protection, Cloud Computing, BIM², e-Health and most recently AI and IoT & Future Networks. Working with the IDA Ireland and IMR, NSAI chairs a Standards development committee as a member of the National Robotics Steering Committee and was part of an IDA Ireland</p> |

¹ A strategy developed by DCCOI and DBEI as part of the Year of Irish Design initiative to ensure long term development of the design sector and to encourage business investment in design.

² BIM – Building Information Modelling

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| | <p>led delegation for the digitisation of Industry Conference in Boston on Advanced Robotics and Deep Machine Learning in October 2017.</p> <p>NSAI is an active partner with our EI, IDA Ireland, SFI, IMR¹ and other partners on various national initiatives including ‘AI Island’ (culminating in the establishment of a new national Standards mirror committee engaged in international AI standards development, and the All Ireland Smart Cities Forum linked to our new IoT Standards committee. During 2017 NSAI also supported the embedding of standards into companies R & D processes by presenting at various innovation events including:</p> <p>EI Innovation in Construction for EI Technology Gateway client companies: Midlands Engineering cluster companies on Innovation Management and the 34th International Manufacturing Conference in Sligo.</p> <p>European</p> <p>In the context of EU standardisation policy initiatives related to the ‘Digital Single Market’ and ‘Digitising European Industry’ (DEI), NSAI attended ICT Standardisation Multi Stakeholder Platform (MSP) meetings resulting in the publication of the ICT Rolling Plan identifying key ICT standardisation activities in support of EU policies and regulations. NSAI also actively participates in the recently established joint Multi Stakeholder Platform/Digitising European Industry Working Group (MSP/DEI WG) on standardisation in support of Digitising European Industry. NSAI is hosting the 2018 EURAS (European Academy of Standardisation) conference in June 2018. The theme of the conference is ‘Standards for a smarter future’ and is targeted at the European research community.</p> <p>International</p> <p>NSAI recruited and supported new Irish experts to engage in international Standards development work in key emerging areas, and in attending related international Standards development meetings across the globe. In 2019, NSAI will host 3 international standards plenary meetings on Blockchain, AI and Industrial Robotics & Automation.</p> <p>Conclusion</p> <p>Over the coming period, NSAI will continue to work on the areas outlined above, and in close collaboration with our DBEI, EI, IDA Ireland and SFI colleagues on the development of a new National Industry 4.0 Strategy. Just as Standards were crucial during the first industrial revolution over 250 years ago, they will also play a critical role in the fourth.</p> <p>NSAI also plan to establish a new ‘Innovation Award’ to help further stimulate and support the embedding of Standards into the RDI processes of Irish based companies.</p> |
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¹ IMR – Irish Manufacturing Research

Education for Innovation

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| Action No. 3.1 | 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 | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DES |
| Progress Update | <p>DES's STEM Education Policy Statement and Implementation Plan published in November 2017 provides a national focus on STEM education in schools. It builds on a range of reforms and initiatives already underway around STEM, in areas such as curriculum and assessment reform, teacher professional development, embedding digital learning and advances in initial teacher education. It focuses on encouraging and inspiring more young people, particularly more females, to specialise in Science, Technology, Engineering and Mathematics during their education and training.</p> <p>The Action Plan for Education, 2016-2019 and Action Plan for Education 2018 commits to the development of Ireland's Education System such as the introduction of new specifications in our Leaving Certificate Science subjects with a view to increasing uptake for all in these subjects.</p> <p>The Professional Development Service for Teachers (PDST) has a dedicated STEM team to focus on development of STEM-related CPD. ICT in Teaching and Learning is a mandatory element of all Initial Teacher Education programmes and optional modules on coding/programming may be offered by some providers.</p> <p>A STEM team has been established within the PDST and are working on developing quality assured exemplars of highly effective STEM learning experiences for all learners from early years to post-primary including good practice videos, case studies and sample portfolios.</p> <p>Junior Achievement Ireland are providing training for volunteers from industry to engage with schools providing a lesson per week for 5 weeks on STEM areas e.g. Earth and Space, Coding, Engineering etc.</p> <p>The JCT Science team is providing core workshops where teachers explore changing approaches to assessment and the value in capturing a broader picture of learning. For example, through STEM outreach opportunities such as school based/regional/national Science fairs, Science quizzes and other competitions. This can then feed into the learner's Classroom-Based Assessments in Science.</p> <p>Through the STE(A)M in Junior Cycle initiative, Science teachers engage with elective partners from the STEM and The Arts fields. As part of this professional learning, teachers are exposed to a broad array of outreach partners which they could connect with in terms of other areas of learning. Teachers experience opportunities to work with a number of</p> |

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| | institutes and partners that run school visits, centre visits/workshops and competitions. | | |
| Action No. 3.2 | 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 at second level by 2020 | | |
| Status | a. Ongoing | b. Ongoing | c. Ongoing |
| Implementation Date | a. 2016 – 2020 b. 2020 c. 2020 | | |
| Lead Responsibility | a. SFI, DES, HEA, with other funders, stakeholders and co-sponsors b. SFI, DES, HEA c. SFI | | |
| Progress Update | a. SFI has made notable progress on this action. Under the 2017 SFI Discover programme a total of €4.4m was awarded across 41 projects to support projects engaging the Irish public with STEM. Under the Smart Futures programme (academic year 2016/2017) 114 school visits were delivered (2/3 of which were to girls' or mixed schools) and over 80 career events were attended. Additionally, cinema and TV advertising took place which increased traffic to the Smart Futures.ie website. In 2017 the HEA funded an additional 29 ICT Summer and Autumn computing camps across 11 HEIs for around 2,200 secondary school students. Through the ICT camps students get hands-on experience of a variety of activities like programming, coding, app design, digital media, web design, gaming and robotics. 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. All our education materials are available through Irish and English, and are developed in close consultation with Irish schools, using Irish data and closely linking them to the primary and second level school curriculum. The EPA also contributes a lesson to the Science and Technology in Action secondary school pack. IRC continues to support Science Week through public communication measures. In addition, the Council sponsors a special award at the annual BT Young Scientist Exhibition. b. In 2018 the HEA has confirmed funding for another 36 computing camps across 13 HEIs with a proposed intake of around 6,400 students. The HEA will also again support College Awareness Week (to run in November 2018) to encourage young people to consider | | |

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| | <p>the benefits of going on to third level, including what STEM courses have to offer.</p> <p>SFI has progressed this action. Highlights include new regional science festivals launched during Science Week 2017 in Carlow and Tipperary and a variety of innovative events were funded in Dublin including The Science of Horror Movies and Irish Mental Health Legacies of the Great Famine. SFI Awards of Science and Maths Excellence: in 2017, 120 schools participated in this Continuing Professional Development (CPD) programme. The focus of the CPD is to support the teaching of the primary science curriculum using an inquiry-based approach to STEM teaching and learning. In addition to this, 593 schools received the SFI Discover Science and Maths Award for their work in STEM throughout the year. An SFI joint initiative with RTÉ produced three documentaries and the week long daily show, Big Week on the Farm. Big Week on the Farm in 2017 reached an average of 312k viewers at a 25.9% share of audiences. Over 1.5 million people tuned in over the course of the week.</p> <p>Researchers funded by SFI are actively encouraged to engage with the public as part of their grant. In 2017, the broad SFI research community delivered 1530 education and public engagement activities which represents a 60% increase on 2016. In particular, SFI has supported the SFI Research Centres to roll out comprehensive public engagement programmes.</p> <p>The Irish public’s awareness of STEM is measured as part of the SFI Science in Ireland Barometer. The next refresh of the Barometer is currently scheduled to be redone in 2019.</p> <p>c. STEM Central Applications Office 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.</p> |
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| Action No. 3.3 | 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 | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DES, SOLAS, Skillnets with industry, GSI |
| Progress Update | <p>DES reports that The Action Plan to Expand Apprenticeship and Traineeship in Ireland 2016-2020 sets out a series of detailed actions and annual targets on how the expansion commitments in the area set out in the Action Plan for Education will be met. Over the lifetime of the plan 50,000 learners will register on apprenticeship and traineeship programmes. This represents a more than doubling of activity by 2020.</p> <p>To date 11 new apprenticeship programmes are now operational (including the five announced in the second Progress Report) and have apprentices registered, following the Apprenticeship Council’s first call for proposals in 2015, including Industrial Electrical Engineering, Polymer</p> |

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| | <p>Processing Technology, Manufacturing Technology, Manufacturing Engineer, Accounting Technician, two programmes in International Financial Services (Associate & Specialist) and two programmes in ICT (Network Engineer and Software Developer). Further new apprenticeships are to be submitted to Quality and Qualifications Ireland (QQI) for validation shortly and, subject to successful validation, will get underway in 2018.</p> <p>Following a second call for new apprenticeship proposals in 2017 a further 26 new programmes have been approved for further development into national apprenticeships. These programmes span a wide range of skills and sectors including construction, engineering, ICT, horticulture and agriculture.</p> <p>At the end of 2017, an additional eight new traineeships had been developed in areas such as engineering, laboratory assistant, and interior systems. These new programmes will complement the existing programmes on offer. The programmes have been designed by ETBs working in collaboration with employers to meet identified skill needs. In addition, we have broadened the eligibility criteria on participation to include school leavers, older learners and people in employment.</p> |
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| Action No. 3.4 | Ensure that world-class standards apply to the quality of postgraduate researcher education and training |
|  <p>European Research Area</p> | 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 | <p>The National Framework for Doctoral Education sets out key principles for doctoral education in Ireland and has been committed to by all institutions and the main research funding agencies. To advance the Framework, QQI has issued Research Degree Programme Policy and Criteria. It is now developing a Code of Practice to assist in institutional implementation.</p> <p>The Advisory Forum for the Framework, co-chaired by the HEA and QQI, held its inaugural meeting on 11 April 2018. The Forum membership comprises student representatives, the institutions, research funding agencies and the DBEI and DES. Agenda items included the Terms of Reference for the Forum and DBEI/SFI's consultation on the latter's new doctoral education and training programme.</p> |

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| Action No. 3.5 APJ 2018 No. 51 | Increase enrolment of postgraduate researchers to address demand in the economy |
| Description  | Increase research masters and Ph.D. enrolments by 500 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 | <p>From the 2013/14 baseline, enrolments initially increased by 93 in 2014/15, but decreased by 10 in 2015/16 and by a further 117 in 2016/17, resulting in a net decrease of 34 enrolments from the baseline year. IRC, SFI and other agencies are actively addressing this issue, with a number of positive developments in 2017/2018 working towards meeting the target by 2020.</p> <p>The IRC will award in the region of 280 funded individual postgraduate research scholarships in 2018, across the Council's Government of Ireland and enterprise-facing programmes. The total investment in these awards is €21m. The majority of these awards will be in STEM disciplines. In addition, there are 94 fundable postgraduate research awards in reserve arising from the Government of Ireland call. Additional budget for Council of €7.4m over four years would be required to enable the Council to fund these additional awards. 52 of the reserve awards are in STEM disciplines.</p> <p>EPA reports that as part of the EPA-IRC Scholarship scheme, 3 Scholarships were funded in 2017 and 6 are due to be awarded in 2018. The EPA will continue its Strategic Partnership with the IRC for their 2018/19 Call. As part of the DIT Fiosraigh Enterprise Scheme, 1 PhD was co-funded between EPA & DIT in 2017/18. As part of the 2017 projects funded from the 2017 EPA Annual Calls, 7 PhDs will be funded. It is also estimated that there are c. 55 PhDs funded through on-going EPA-funded projects (through its annual calls).</p> <p>As part of the target set for increased enrolment of postgraduate researchers, SFI launched a new €100 million postgraduate research training programme in May 2018. The new SFI Centres for Research Training (CRT) initiative, which is informed by a consultation process led by the Department of Business, Enterprise and Innovation, will provide training for 600 postgraduate students in areas of nationally and internationally identified future skills needs of digital, data and ICT. A cohort-based approach will be adopted with 150 new students starting their postgraduate programme each year from 2019 (i.e. 4 cohorts). CRTs will be required to build partnerships with enterprise in the design and delivery of training programmes to ensure that postgraduates have the necessary skillsets to meet the needs of enterprise and to attract investment to Ireland through the availability of a high-value talent pipeline.</p> |

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| | <p>It is expected that four or five CRTs will be funded from the first call with CRTs being either single- sited or based on a partnership across a number of institutions. SFI will provide funding for 4 out of every 5 places and host institutions will be expected to leverage additional funding for the other 20 per cent of places.</p> <p>CRTs will provide scale and sustainability to allow for the development and delivery of innovative training opportunities for students. The cohort approach will expose students to the wider scientific relevance of their research, encourage peer-to-peer learning and facilitate the establishment of networks. The CRT initiative alone will contribute 150 places of the 500 increase in annual enrolments targeted in Innovation 2020. Other SFI programmes are also contributing to this target.</p> |
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| Action No. 3.6 | 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 Higher Education sector. |
| Status | Ongoing |
| Implementation Date | 2020 |
| Lead Responsibility | SFI, IRC, Other Research Funders |
| Progress Update | <p>DAFM, through its research funding programmes (Stimulus, FIRM and CoFoRD), continue to support collaborative inter-disciplinary research including the development of the new thought and technology leaders for the agri-food sector through post doctorate researchers on suitable scientific and impactful research projects. DAFM will announce in Q3 2018 details of substantial expenditure on a number of new research projects arising from DAFM's 2017 Research Call and the majority of these projects will provide funding for participating post doctorate researchers.</p> <p>The HRB supports the training and career development of researchers through a number of mechanisms and at many different levels, for example.</p> <ul style="list-style-type: none"> • Support existing interdisciplinary capacity enhancement awards for postdoctoral researchers in population health and health services research, and expand the scheme to include patient-oriented research and/or translational medicine. • Review and monitor support for postdoctoral researchers through existing funding mechanisms. • 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. To date 11 awards have been made to excellent early and mid-career researchers, at a total value of €8.3m. • A key goal of Enabler A of the HRB Strategy 2016-2020 Research Evidence Action is to provide opportunities for |

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| | <p>postdoctoral researchers and new investigators to continue their research and develop independent research careers within the health research system.</p> <p>The IRC will award in the region of 90 funded individual postdoctoral research fellowships in 2018, across the Council's Government of Ireland and enterprise-facing programmes. The total investment in these awards is €7.5m. The majority of these awards will be in STEM disciplines. In addition, there are 50 fundable postdoctoral research awards in reserve arising from the Government of Ireland call. Additional budget for Council of €4.4m over two years would be required to enable the Council to fund these additional awards. 25 of the reserve awards are in STEM disciplines.</p> <p>IRC is funding an additional c.50 postdoctoral positions this year through the new Laureate awards for frontier research. A further c.40 postdoc positions (two-thirds which are STEM) are contained within the Laureate reserve proposals. There are 31 excellent reserve Laureate proposals which could be funded, including the associated postdoc positions, with additional funding for Council (€3.8m per year for four years). In addition to the existing postdoctoral throughput, the Council has awarded 22 prestigious Marie Skłodowska Curie Actions (MSCA) Fellowships in 2018, and is shortly to open a new Call for a further 11 fellowships. Interdisciplinarity, 'intersectorality' and mobility are the three core principles of MSCA.</p> <p>Almost all of SFI's programmes, for example the Investigators Programme and the Research Centres programme, support post-doctoral researchers. SFI's industry facing programmes such as the SFI Industry Fellowship, the Strategic Partnerships Programme, the Research Centres Spokes programme, and the Research Centres programme link industry with qualified researchers. There has however not been a significant increase in the number of SFI-funded post-doctoral places; this would require a significant increase in SFI's budget.</p> |
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| Action No. 3.7 | Ensure continued opportunities for researcher career development in areas of strategic importance | |
| Description | <p>a. Increase the number of early- and mid-career independent researcher awards by doubling the number of awards (Starting Investigator Research Grant and Career Development Award) from 20 to 40 per annum to enable formation of the next generation of Principal Investigators and ensure a vibrant research ecosystem</p> <p>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.</p> | |
| Status | a. Ongoing | b. Delayed |
| Implementation Date | <p>a. 2020</p> <p>b. 2017</p> | |
| Lead Responsibility | <p>a. SFI</p> <p>b. DES, HEIs, HEA</p> | |
| Progress Update | <p>a. Continuing to deliver on the specific targets on this action will be challenging without further funding being allocated.</p> <p>SFI ran a CDA call in 2016 which resulted in 22 awards being made in 2017; these were formally announced in April 2018. A new CDA</p> | |

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| | <p>call is scheduled to launch Q4 2018. The SIRG call launched in January 2018 which received over one hundred eligible applications with award offers expected to be made at the end of 2018. Due to budget constraints, the expected number of awards will be approximately 20. In order to meet the targets set out in Innovation 2020, the CDA and SIRG calls would each have to run every year which current budget constraints do not allow.</p> <p>In addition to SFI, other research funders are providing the following initiatives:</p> <p>New opportunities are being provided to researchers for their career development through the IRC's roll-out of its inaugural Laureate Awards: in March 2018, funding of €29.6m was announced. Within this, €7m has been allocated to 18 'Starting' Laureate Awards to support early-stage researchers at the outset of their careers. A further €10.6m has been provided through 18 'Consolidator' Laureate Awards to researchers with an established track record who are aiming to progress to the next level. Successful projects range from research into age-related vision loss to sustainable food production. In addition to this first round of awards, the Department of Education and Skills also announced a further investment of €12m for Advanced Grants under the IRC Laureate Programme. Senior researchers will have the opportunity to compete for an Advanced Laureate Grant of up to €1m over four years.</p> <p>The HRB launched an Emerging Investigator Award in 2017 to support promising emerging investigators in developing an independent research career. 11 awards worth €8.3m have been made to date in this scheme. To encourage the development of clinician scientist in the Irish health system, the HRB is also cofounding of a PhD Scholars Programme for Clinical Academics (ICAT) with Wellcome Trust. The ICAT programme will support the training of up to 40 emerging clinician scientists in the coming years.</p> <p>b. Researcher career development naturally forms part of the work underway through the Higher Education Research Group (HERG) that is chaired by the Department of Education and Skills. The HEA is engaging, as part of this, on the IUA-led researcher career framework which was advanced at the last HERG meeting on 9 April 2018. The framework will be revised to take on board the feedback at that meeting and will then be brought to the I2020 Implementation Group.</p> |
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| Action No 3.8 | 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 | Completed 2017 |
| Implementation Date | 2017-2020 |
| Lead Responsibility | IRC |
| Progress Update | 36 frontier research (Laureate) awards announced in Q1 2018, representing an investment of €18m across the life sciences, physical sciences and engineering and arts, humanities and social sciences. |

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| | <p>The standard of application was such that there are 31 excellent reserve proposals under the first Laureate Call. Additional budget for the Council of €15.3m (or €3.8m per year over four years) would be required to fund these reserve awards.</p> <p>An Advanced Grant Call opened in Q2 2018, which will result in 12 new awards valued at €1m each, representing a further commitment of €12m.</p> <p>Beyond the Advanced Grant competition, there is no funding provision as yet for a third and subsequent calls under this Council programme.</p> |
| Action No. 3.9 APJ 2018 No. 48 | Attract world-leading research professors and future research leaders to Ireland to address gaps in particular areas of priority |
| Description  | <p>a. Scale up both Research Professor and Future Research Leaders awards by an additional 3-5 to 10 per annum to address gaps in priority areas of research where Ireland needs to strengthen its research capacity.</p> <p>b. Engage the Irish embassy network to promote the SFI Research Professorship awards and more generally to promote Ireland as a destination for a research career.</p> |
| Status | <p>a. Ongoing</p> <p>b. Ongoing</p> |
| Implementation Date | <p>a. 2020</p> <p>b. 2016 – 2020</p> |
| Lead Responsibility | <p>a. SFI, HEIs, funding agencies</p> <p>b. DFAT / SFI, funding agencies</p> |
| Progress Update | <p>a. SFI reports that following completion of the FRL 2017 call, two awards have been made in 2018. Due to budget constraints, two awards from the 2017 call have been placed on a reserve list. A new call to the Future Research Leaders Programme will be launched in May 2018, with an aim to fund up to five new awards in 2019. To date in 2018, one Research Professorship award has been made to Murray Hitzman (UCD); this was announced by Minister Seán Kyne in March 2018. Another two Research Professorship proposals are under review and an additional seven EOIs have been received. Budget is available to fund 3 Research Professorships in 2018. In total, a maximum of 5 awards (2 FRL and 3 Research Professorships) will be made in 2018 with existing budget availability. This is behind the Innovation 2020 target. The interest in the programme is growing (7 EOIs submitted) and will continue to grow with a relaunch of the programme in May 2018. Significant additional budget is required to meet this demand and to reach the Innovation 2020 targets.</p> <p>New call documentation for the Research Professorship Programme was published in May 2018, which will implement some important changes:</p> <ul style="list-style-type: none"> • Emphasis on ERC award holders and potential ERC award holders • Potential for joint appointments where Professors work in Ireland and abroad • Gender balancing initiative supporting excellent female candidates • Endowed chairs – called out for the first time |

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| | <p>HRB is conducting a review of to better understand how it can better attract and support research leaders in both the academic and health system to undertake high-quality relevant health research. This new award scheme will enhance the current Research Leaders in Population Health and Health Services Research, of which there are 10, and provide opportunities for senior Clinician Scientists to establish or further develop their research in the Irish health system.</p> <p>b. DFAT provides information and messages for use by the Embassy network on research, innovation and educational opportunities in Ireland as part of its regular briefing packs for missions.</p> <p>SFI provides DFAT with briefing on Ireland's research offering through continuous, direct Embassy and Consulate engagement and events such as the St. Patrick's Day programme, as well as broader engagements through DFAT HQ such as annual pre-posting training. The embassy network promotes all of SFI's programmes, with a focus on SFI's international recruitment schemes:</p> <p>The SFI President of Ireland Future Research Leaders Award programme which is a recruitment-driven programme designed to attract to Ireland outstanding new and emerging research leaders. The SFI Research Professorship Programme which seeks to support national strategic priorities by assisting research bodies in the recruitment of world-leading researchers for Professorial Chairs, or similar research leadership positions in targeted scientific areas.</p> |
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| <p>Action No. 3.10 APJ 2018 No. 49</p> | <p>Develop a coherent national policy on structured progression for researchers</p> |
| <p>Description</p>  | <p>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</p> |
| <p>Status</p> | <p>Nearly complete</p> |
| <p>Implementation Date</p> | <p>2016 – 2020</p> |
| <p>Lead Responsibility</p> | <p>DES with DBEI and relevant stakeholders</p> |
| <p>Progress Update</p> | <p>The Irish Universities Association has been developing the proposed framework and has consulted policy makers and research funders. It is envisaged that their work on the framework will be finalised this year. When fully completed, the framework for researcher careers will bring clarity and certainty to the career structure and provide researchers with developmental opportunities to enhance their skills and employability, whether it be in academia, in the enterprise sector or the wider economy.</p> |

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| Action No. 3.11 APJ 2018 No. 49 | 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 | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | HEA, IRC, SFI and all research funders |
| Progress Update | <p>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.</p> <p>HEA reports that all institutions provide career advice to early-stage researchers and this is evolving as new opportunities emerge, such as the Laureate Awards as described under Action 3.7 above. The researcher careers' framework, also referred to under 3.7 above, is an important development in this context. As is the kick-off of the Doctoral Framework Advisory Forum, co-chaired by the HEA and QQI, noted under Action 3.4 above and critically including student representation.</p> <p>A further important 2018 development is the piloting of the new ISSE Postgraduate Research Student Survey. The ISSE – Irish Survey of Student Engagement – was launched in 2013 for taught students and provides an important means by which the student perspective on their educational experiences can be sought and then used by the institutions to enhance provision. It was recognised in 2013 that a different survey instrument would be needed to cater for research students. This has now been developed collaboratively through an ISSE Working Group in which the HEA actively engages. The pilot is currently underway with outputs due Q4 2018.</p> <p>HRB runs an Internship Scheme to expose early-stage post-doctoral researchers to a funding agency environment, and provides relevant training to each cohort (currently 4). Through its SPHeRE programme, PhD students are placed in policy and practice relevant settings for a period of their training, and within the NSAFP programme, medical doctors undertake a PhD by research as an integrated part of their specialist register training.</p> <p>The HRB also supports mobility of its researchers to enhance their exposure to, and knowledge of, other research and work environments, for example through its the Fullbright-HRB Health Impact Scholars awards, of which 4 were awarded in 2018, its Ulysses Travel Awards co-funded with the French Embassy, and through co-funding of emerging cancer epidemiologists with the National Cancer Institutes.</p> <p>IRC opened a new partnership-based funding programme, COALESCE, in Q2 2018 which provides opportunities for early-career researchers, under the supervision of a principal investigator (awardee) to gain exposure to other working environments, including public policy and civil</p> |

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| | <p>society. The IRC’s suite of enterprise programmes provide opportunities for early-career researchers to develop track record in working environments outside academia. The IRC have recently closed the 2018 Employment-based programme Call, and expect to make in the region of 35-40 awards. The Council’s Enterprise-Partnership Scheme Call will open in late Q2/early Q3 and will offer both postgraduate and postdoctoral opportunities for research collaboration with industry. The Council has developed and adopted a Career Development Policy Statement which draws on national and international good practice.</p> <p>SFI has partnered with the Engineering and Physical Sciences Research Council (EPSRC) in the UK to support joint Irish/UK applications for Centres for Doctoral Training. The centres focus on cohort-based doctoral training in areas of strategic need. Although not mandatory, many applications include partnerships with industry and placement schemes, providing opportunities for exposure to non-academic career paths. Applications to the 2018 call are currently under review. A public consultation on the future SFI Centres for Research Training was led by DBEI. The call, which aims to develop a pipeline of highly trained research talent in areas of strategic priority for Ireland, was launched at the end of May 2018. Applicants were required to engage with non-academic partners in the design and delivery of training programmes, and non-academic or international placements will be a mandatory element of these programmes, ensuring that students are exposed to a variety of career paths. The potential for mentorship as well as structured career guidance was included in this call.</p> <p>SFI provides industry-based career opportunities for post-doctoral researchers through the SFI Industry Fellowship programme. The post-doctoral researcher can spend up to a year full-time or two-years part-time working on a collaborative research programme in industry. To date, SFI has made 169 Industry Fellowship awards, including 24 new awards to be announced from the last call.</p> <p>SFI Technology Innovation Development Award (TIDA) Programme objectives, amongst others, are to develop awareness of entrepreneurship and the commercialisation process, and to encourage movement from academia to enterprise activities, particularly amongst early-career post-doctoral researchers. In the 2017 call of 104 eligible applications, 28 were from early career stage post-doctoral researchers, and of these 6 were supported for funding.</p> |
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| Action No. 3.12 APJ 2018 No. 49 | Ensure the mobility of researchers between academia and industry | | | |
| Description  | <ul style="list-style-type: none"> 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 | a. Ongoing | b. Ongoing | c. Ongoing | d. Ongoing |
| Implementation Date | a. 2016 – 2020 | | | |

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| | <p>b. 2020 c. Deferred to 2018 d. 2016 – 2020</p> |
| Lead Responsibility | <p>a. SFI, IRC, other funders b. SFI c. HEA, research funders d. DBEI, IUA</p> |
| Progress Update | <p>a. Progress continues to be made by SFI, with an increase in the total number of Industry Fellowship awards in 2017 of 41 compared with 39 in 2016. The total value of the 2017 awards is €3.3 million. The launch of the Industry Fellowship 2018 call will be in September 2018. IRC's 2018 Employment Based Programme recently closed (evaluation now underway) and the Enterprise Partnership 2018 Call for postgraduates and postdocs will open end Q2/early Q3. For both programmes, all research awards will include an enterprise or employment partner. The Council made 77 awards in 2017 between the two schemes, and will be seeking to increase this figure for 2018.</p> <p>b. The number of PhD researchers transferring from SFI research teams to industry increased to 29% in 2017 from 27% in 2016. 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.</p> <p>c. The HEA's Graduate Outcomes Survey is a newly reformed survey that gathers information on the first destination of undergraduate and postgraduate graduates of universities, colleges and institutes of technology, nine months after completion of study. For the first time in an Irish context, it will allow for a national report on the outcomes of all Irish higher education graduates. The new survey and database will provide the following:</p> <ul style="list-style-type: none"> • Data on graduate qualifications and employment both within Ireland and overseas • Relevance of employment to area of study • Data on graduate further study • Data on graduate unemployment and unavailability for work • Consistent data across institutions • Graduate perceptions of the quality and relevance of their higher education experience <p>The first iteration of the new survey is currently underway (March – August 2018) with a national report expected to be published in December 2018.</p> <p>IRC is conducting a 360-degree review of its awardee management system. Tracking researcher careers will be a key area within this work, and the review will make recommendations for how the system can be transformed to meet this and other information goals.</p> <p>d. DBEI continues to support the EURAXESS Ireland Office which is hosted by the IUA and facilitates researcher mobility. In 2017, EURAXESS Ireland processed 439 hosting agreements and 180 agreements were extended. The hosting agreements covered researchers from 73 different non-EEA countries.</p> |

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| Action No. 3.13 | 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 | Completed 2017 |
| Implementation Date | 2017 |
| Lead Responsibility | SFI, EI |
| Progress Update | Refer to Second Progress Report |

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| Action No. 3.14 | Address barriers to pension portability that can restrict researcher mobility |
| Description | Explore possibility of higher education institution and other RPO participation in the EU RESAVER pension scheme |
|  European Research Area | |
| Status | Delayed |
| Implementation Date | 2016 |
| Lead Responsibility | DES, HEA, HEIs, RPOs |
| Progress Update | DES reports that the IUA Pensions Group has undertaken initial examinations of the EU Resaver scheme and the potential for its introduction in Ireland. The introduction of the Scheme would require an exemption from the State single pension scheme. |

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| 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 |
|  European Research Area | |
| Status | Ongoing |
| Implementation Date | 2016 - 2020 |
| Lead Responsibility | DES, HEA, funding agencies |
| Progress Update | DES report that In May 2018, Maynooth University and NUI, Galway received the Athena Swan Bronze award. All of the universities have now received this award, in addition to a number of institutional departments. To be eligible to compete for research funding allocated by the EPA , higher education institutions will be required to have secured the minimum Athena SWAN gender equality accreditation by end 2019. 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. |

The **HEA** National Review on Gender Equality in Irish Higher Education Institutions was an important milestone in developing a strategic approach to tackling gender inequality in Irish Higher Education. Implementation of the Reviews' recommendations is part of the HEA's annual Strategic Dialogue process with the institutions and the enhanced governance arrangements in place within the institutions.

In November 2017 Minister Mitchell O Connor established a Gender Equality Taskforce, which as part of its work is overseeing a national systems review of the recruitment and promotion policies and practices currently in place in higher education institutions, with a view to identifying good-practice and highlighting areas that need improvement. This Taskforce is expected to report in Summer 2018.

Applicants to **DAFM's** 2017 Research Call were reminded to be cognisant of the relevant recommendations of the HEA National Review of Gender Equality in Irish Higher Education in framing proposals and in undertaking any funded research. It was also flagged to applicants that they may be asked to give evidence of action taken to promote and increase the numbers of females working in DAFM funded projects.

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 2017/18 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 including:
 - Assuming a greater national responsibility for promoting gender equality in health research
 - Achieving equality between men and women in access to funding and in participation in research decision-making
 - Fostering the integration of sex and/or gender analysis in the content of HRB-funded research
- Engaging with the Athena Swan initiative and planning to incorporate accreditation into funding decisions in the coming years
- Introduced training on unconscious bias as a prerequisite for the activities of peer reviewers (both postal and panel review).

IRC is working with HEA and other research funders on issues of gender equality. The Council has implemented or is implementing the key recommendations for research funders arising from the National Review of Gender Equality. The Council will be commencing a review in 2018 of its own Gender Strategy and Action Plan (2013-2020).

The Council's research programmes are reporting excellent outcomes on gender equality. 56% of the 2018 Government of Ireland Postgraduate

Scholarships have been awarded to women. At Principal Investigator stage, 44% of the first round of Laureate awards were made to female researchers.

The Council is overseeing an €11m transnational gender research call on behalf of the Gender-Net Plus ERA-net consortium (Council contribution to this budget is €600k). The Council will be exploring the possibility of additional co-funding from other agencies to allow more projects with Ireland-based researchers to be funded.

With additional budget, the Council would be keen to progress female-only Laureate awards to encourage greater gender equality, particularly in certain disciplines in which women are currently underrepresented.

MI participated in the HEA survey in relation to the gender breakdown for project leads on MI funded research awards and the female/male representation on evaluation panels. The MI proactively encourages female project leads in our Guidelines for Applicants in all our research funding calls. The MI allows maternity leave to be incorporated into the research grant budgets, and for grants to be extended in time to allow for maternity leave to be taken.

GSI is co-funding a PhD programme under the SFI iCrag centre, one of the four key objectives is to improve gender balance.

SFI has made further progress on this action: the percentage of female SFI Award Holders Active in 2017 was 28%, up on 25% in 2016 and 21% in 2015. The percentage of female team members was 37%, an increase on 35% in 2016.

In 2016, Science Foundation Ireland published the 'SFI Gender Strategy 2016-2020', which provides a comprehensive framework for delivering Science Foundation Ireland's actions to retain and increase the participation of excellent female researchers in STEM careers.

To ensure that awards made under Science Foundation Ireland funding schemes do not preclude or unintentionally discourage the hiring of female researchers, Science Foundation Ireland continues to offer a maternity allowance that provides award holders with funding when they or a team member take a period of maternity or adoptive leave.

To ensure that the agency review process remains unbiased, all SFI staff, including the executive committee and the SFI board, received sector-specific, data driven unconscious bias training by an external provider. Feedback and learnings from the session have been fed into process improvements within the organisation, such as expanded briefing to peer reviewers and a reconsideration of the information provided to review panels. Refresher courses are being provided to staff on a yearly basis.

The SFI Research Professorship Programme supports national strategic priorities by assisting Research Bodies in the recruitment of outstanding, world-renowned research and leadership talent to Ireland. As of 2018, it will be a requirement that for the next two Expression of Interest submissions made to SFI from each HEI, at least one will have to be for a female applicant.

Teagasc has included the development of a gender strategy as a key action in its new HR strategy. Teagasc aims to join Athena Swan Irish Initiative when it becomes available to Irish research institutes. Teagasc is participating in a Horizon 2020 consortium application, under the call

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| | <p>'support to research organisations to implement gender equality plans' (SwafS-09-2018) to address the issue of gender equality in organisations (RPOs and RFOs).</p> <p>Higher education institutions will be required to have secured the minimum Athena SWAN gender equality accreditation by end 2019 to be eligible to compete for research funding allocated by the EPA. 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.</p> |
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| Action No. 3.16 | Ensure a strategic approach to the development of existing and new research infrastructure programmes | |
|  <p>European Research Area</p> | <p>a. Scope out and develop a successor to PRTL I to support new investment in research infrastructure in the wider research base and to allow for maintenance and upgrading of existing facilities and equipment.</p> <p>b. Review and optimise roll out of policies for accessing research infrastructure including policies to maximise enterprise use of, and partnerships in, research infrastructure.</p> | |
| Status | a. Ongoing | b. Ongoing |
| Implementation Date | <p>a. 2016</p> <p>b. 2016 -2020</p> | |
| Lead Responsibility | <p>a. DBEI, DES, SFI, HEA with other departments and funders, HEIs, enterprise agencies and other stakeholders</p> <p>b. HEA, HEIs, Research Funders</p> | |
| Progress Update | <p>a. The scoping of a future cycle of PRTL I has been undertaken by DBEI, working with DES. Future cycles of PRTL I are identified in the National Development Plan as an important component of the Innovation pillar.</p> <p>Pending a Government decision on the timing and scale of a future cycle of PRTL I, DBEI, DES and other research funders are already taking action to fund infrastructure and human capital in the area of research.</p> <p>Through Budget 2018, DBEI allocated €5.5m to start addressing the PhD/Research Masters enrolment challenge. The funding was allocated to SFI, which has made awards through existing SFI programmes that will support c.110 postgraduate research places.</p> <p>That budget will be increased further in 2019 to allow for commencement of dedicated Centres for Research Training (CRTs). It is proposed that the CRTs will provide sustainable programmes of research and training for cohorts of research Masters and PhD students commencing in 2019, with new cohorts of students enrolling in subsequent years. The cohort-based programme will deliver a world-class, student-focussed postgraduate experience which will contribute to the goal of positioning Ireland as a leader in postgraduate researcher training and education.</p> <p>In the area of research equipment and other infrastructure, Science Foundation Ireland has issued a 2018 Call and is currently assessing proposals using international peer review. SFI has already funded</p> | |

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| | <p>more than €50m of research infrastructure across the high education system since the start of 2016.</p> <p>DES also announced funding in the context of Budget 2018 to address the need for physical space for research in the higher education sector. This includes €200m for public private partnerships in the Institute of Technology sector, and €278m for investment in the higher education sector generally, including for research. Exchequer funding of €2.2 billion will be provided in support of infrastructure priorities in the higher education sector over the period of the NDP. This will be alongside continued investment in human capital through research funding.</p> <p>b. To optimise infrastructure access (and related policies), the HEA has engaged a service provider to upgrade the LIRE database to a managed online system to which institutions 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.</p> <p>The HRB has benefited over the years from PRTL 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.</p> <p>Following an international review of activity, the HRB approved a second Phase of funding up to 2021 for its three Clinical Research Facilities located on hospital campuses in Dublin, Galway and Cork, at a total value of €12m</p> <p>In 2017 the HRB initiated planning for a review of Irish clinical research infrastructures (CRF/CRC, CRCI, Clinical Networks including CTI, TMRN) to inform future investment in this vital area for clinical research activities. This activity will take place over 2018 with a report of findings in 2019.</p> |
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Innovation for Social Progress and the Economy

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| Action No. 4.1 | Address public policy needs and optimal use of research | |
|  European Research Area | Government departments will: <ol style="list-style-type: none"> Ensure that they are making best use of scientific evidence in the execution of their mission and address gaps where they arise. Evaluate all funding programmes to ensure continued relevance and clarity of purpose. | |
| Status | a. Ongoing | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | All Government departments | |
| Progress Update | <p>a. When conceiving new Calls, DAFM goes to considerable lengths to ensure that the research funded addresses knowledge gaps including those of policy relevance. In this regard, newly funded projects stemming from our most recent Call to be announced in late Q2 2018 will be monitored and interrogated for scientific insights on a range of current pressing issues. In addition, DAFM places considerable emphasis on widely disseminating the findings of funded projects through a variety of academic and contemporary channels. Finally, DAFM policy and other officials regularly attend conferences, seminars, workshops and other events organised by funded project leaders in order to capture the most up-to-date evidence for policy formation across a range of agri-food and forestry areas.</p> <p>DBEI published the Review of Capital Expenditure on Research, Development and Innovation (200-2016) in July 2017, providing input to the Review of Expenditure 2017. The report traces expenditure from its objectives to inputs, outputs, outcomes and impacts between the period 2000 to 2016. DBEI also published Research Priority Areas 2018 to 2023 in March 2018, please refer to Action 2.3.</p> <p>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.</p> <p>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.</p> <p>DoH investment in research projects, programmes and centres, through the HRB, are providing the evidence in:</p> <ul style="list-style-type: none"> 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 | |

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| | <p>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.</p> <p>The EPA is implementing its Research Communication Strategy 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 is funding a 15-month research project looking at knowledge transfer.</p> <p>b. DAFM Research Programmes (FIRM, Stimulus, CoFoRD) are subject to a DPER-led Spending Review in 2018 which will evaluate the programmes for continued relevance and clarity of purpose.</p> <p>The Irish Government Economic and Evaluation Service or IGEES is an integrated cross-Government service that aims to support better policy formulation and implementation in the civil service. It enables evidence based policy making through production of timely and relevant analytical output across all policy areas. IGEES also supports skills development and capacity building across Government Departments through recruitment, structured mobility and learning and development. IGEES provides platforms for discussion on analytical output and its relevance for policy development, such as IGEES conferences, IGEES Strategic Policy Discussion seminars and other events. Since its establishment in 2012, IGEES has grown to over 140 IGEES economists, evaluators and policy analysts across all Government Departments and over 350 people in the wider IGEES Network.</p> <p>IGEES supports the application of the Value for Money Review Initiative, which supports Departments as they conduct regular reviews of programme expenditure areas. Departments committed to undertake over 40 Value for Money Reviews in the period 2015-2017. Of these, 11 are published and 16 are underway. Since 2017, IGEES has been supporting the Spending Review initiative. Finally, through its research fund, IGEES supports analytical work which provides insights in relation to cross-departmental issues. IGEES publications can be found at https://igees.gov.ie/. 44 analysis papers on a range of topics were published on the IGEES website in 2017.</p> |
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| Action No. 4.2 | Ensure R&D expenditure is afforded a sufficiently high priority in Government department budgets |
|  <p>European Research Area</p> | 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 | <p>Since the publication of Innovation 2020 in 2015, Government Expenditure on R&D has increased from €736m in 2015 to an estimated €768m in 2017. However, despite this increase, continued growth in GNP means that the R&D intensity rate has slipped back from 1.79% in 2014 to 1.43% in 2016. Further increases in public spending in R&D are essential if we are to realise our goal of meeting our 2.5% target.</p> <p>To highlight the importance of increasing R&D spending, the Innovation 2020 Third Progress Report 2018 will be brought to Cabinet in advance of the Estimates 2019 process.</p> <p>A significant contribution to the achievement of the 2.5% target is the level of Business Expenditure on Research and Development (BERD). The Government seeks to ensure that Business Expenditure in R&D is promoted through its comprehensive range of policies and initiatives.</p> <p>DAFM engaged effectively with the estimates process in late 2017 and ensured that it has a satisfactory budget allocation for the operation of its competitive research funding programmes for 2018</p> <p>DoH sought an increase for the HRB's revenue budget as part of the estimates for 2018. An additional €0.960m was secured for the HRB in this regard bringing its allocation for 2018 to €33.014m. In addition, the HRB receives capital funding of approximately €10m.</p> <p>DES report that under the mid-term capital review additional multi annual research funding is being provided in 2019 to enable a number of the Innovation 2020 actions to be progressed.</p> |

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| Action No. 4.3 | Address global and national societal challenges |
|  <p>European Research Area</p> | 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 | <p>The National Development Plan identified a number of specific Priority Investments in the area of Innovation, including the establishment of a €500 million challenge-based Disruptive Technologies Innovation Fund. The Disruptive Technologies Innovation Fund will be implemented through the DBEI and its agencies, working with other research funding bodies to develop Ireland's innovation ecosystem and responsiveness and will see investment in the development and deployment of disruptive innovative technologies and applications, on a commercial basis, targeted at tackling national and global challenges. DBEI has been in discussions with its agencies and the Department of Public Expenditure and Reform on the design of this Fund.</p> <p>The EPA has carried out an extensive consultation (internally as well as with the national research coordination groups, key stakeholders, relevant Departments and included contributions received from academia) to identify key research needs for inclusion in its 2018 Research Calls, which were informed by the latest 2016 EPA State of the Environment Report and latest policy development.</p> <p>The HRB has developed a number of awards under its Strategy 2016-2020 to address global and national health challenges including:</p> <ul style="list-style-type: none"> • Launched an Investigator Led Project scheme in 2017 to support innovative, investigator-led and internationally competitive research into major health challenges, in which 20 awards valued at almost €10M have been made to date • Funding of a suite of new schemes targeted at addressing specific challenges in the national health system, including Applied Partnership awards with both academic and policy/health system partners and a Research Collaborative in Quality and Patient Safety with the health system to tackle specific challenges for health service delivery • In 2018, the HRB funded an award in Capacity Building for Evidence Synthesis to build capacity and provide evidence for policy and practice improvement in the national health system. <p>GSI is involved in/funding a number of projects related to natural resources (water, minerals, construction materials, energy) and geohazards that are of national and international importance.</p> <p>The Higher Education System Performance Framework 2018-2020, published in Jan 2018, sets out six major system objectives for Irish</p> |

higher education. Objective Three aims for “*Excellent research, development and innovation that has relevance, growing engagement with external partners and impact for the economy and society and strengthens our standing to become an Innovation Leader in Europe*”. This Framework currently being translated into performance compacts between each institution and the **HEA** through the Strategic Dialogue Process. Each institution will report annually to the HEA on progress against agreed targets/ objectives, on the basis of which the HEA will then prepare a system report for the Department and the Minister.

The **IRC** has developed and launched a new challenge-based research fund, COALESCE (Collaborative Alliances for Societal Challenges). A national challenge framework, using the 10 National Strategic Outcomes under Ireland 2040 has been adopted. The UN Sustainable Development Goals is integrated as a global challenge framework. The Fund will encourage strong collaboration between research and other sectors to address societal challenges, including the public sector and civil society. Co-funding has been put in place from a number of government departments and agencies, including Irish Aid and GSI.

“Sustainable development of marine resources” is a key principle underpinning the work of the **MI**. An example of a key investment in this area is €446k awarded under the JPI Oceans MicroPlastics Call “Ecological aspects of microplastics in the marine environment” for three projects involving Irish partners (GMIT, NUI Galway and UCC). Also, education and outreach activities are an important part of creating awareness of the marine environment, the importance of our oceans and delivering research results and outputs to the general public.

SFI, in collaboration with the American Chamber of Commerce in Ireland, have undertaken to engage with a range of public and private sector stakeholders to identify a number of challenges aligned with the NRP areas that will be the focus of funding support from Science Foundation Ireland.

Teagasc hosts a biennial stakeholder workshop which takes input from stakeholders including farmers, farmers’ representatives, government departments, state agencies, local authorities, NGOs, industry and academics. This helps to decide the upcoming research priorities for Teagasc. In 2017, 92 representative stakeholders attended the workshop which focused on the challenges facing the agri-food industry from Brexit and sustainability targets.

Teagasc is now firmly committed, within its resource constraints and its mission of supporting Irish agri-food as its primary task, to working with Irish Aid, national and international research organisations, NGOs and the private sector to:

- Help ensure that poor individuals, families and communities have improved food and nutrition security
- Enable better functioning, climate resilient food systems and markets that are accessible to and benefit the rural poor
- Support developing countries are to make better of use domestic resources to reduce poverty.

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| | In this context, Teagasc are currently working with Irish Aid, Irish NGOs and national research organisations in delivering projects in Kenya, Ethiopia, Eritrea, Mozambique, Vietnam and Colombia. |
| Action No. 4.4 | Strengthen public policy and societal impact |
| Description  European Research Area | Target supports to cultivate interdisciplinary research; increase the engagement of public entities and civic society in public policy and societal challenge-based research |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | IRC, HRB, (DAFM), (GSI and DCCAE) |
| Progress Update | <p>The aim of the EPA Research Programme is to deliver the evidence-base, new tools/technologies/ways of working/governance to empower communities to make the right choices. The EPA has supported a number of research projects promoting civic society engagements under the Research and Green Enterprise programmes. An on-going 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 this way, it meets research needs of the EPA, HSE and goals of Healthy Ireland.</p> <p>The HRB Strategy 2016-2020 <i>Research Evidence Action</i> contains the commitment to strengthen and develop Patient and Public Involvement (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.</p> <ul style="list-style-type: none"> To strengthen PPI within its awards, the HRB incorporated a public review into one scheme in 2017 and plans to include this element in two schemes in 2018 to provide feedback on the PPI elements of applications. In 2017, in collaboration with the Irish Research Councils, the HRB made five awards, valued at €1.75m, in the new PPI Ignite scheme to fund PPI Coordinators in five Irish universities. The key objective of the scheme is to build capacity for PPI in health research in Ireland, by broadening the group of health researchers who are involving patients/members of the public in their research within and outside of specific funded projects. The first meeting of the PPI Network of Coordinators took place in February 2018 and a programme of collaborative activities was agreed. <p>IRC will open a new call (COALESCE) in 2018 inviting proposals for research with a public policy and societal impact focus, taking an interdisciplinary approach. Funding partners will include Irish Aid and GSI. IRC will also open a Knowledge Exchange Call in 2018, New Foundations, a strand of which will invite researchers to collaborate with</p> |

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| | <p>civic society partners. Another strand of this Call will invite proposals for interdisciplinary workshops seeking to enhance networking and connections between STEM and AHSS researchers.</p> <p>The SEAI actively promotes engagement of researchers from public & private entities and civic society in public policy and societal challenge-based research relating to the energy and low-carbon sectors.</p> <p>Teagasc regularly provides support to government and policy makers in relation to many issues related to agriculture, food, agri-environment and rural development. Significant achievements included:</p> <ul style="list-style-type: none"> • A submission to the Nitrates Action Plan which resulted in all Teagasc proposals being adopted during the review process and the new regulations being approved by the European Commission; • Publication of a revised Marginal Abatement Cost Curve for reducing greenhouse gas emissions which highlights the potential for agriculture, landuse including forestry and bioenergy to reduce or offset emissions by up to 6.2 Mt CO₂-e., • Ongoing advice for Government and industry on the implications of Brexit, including presentation to Oireachtas members, testimony to the Seanad Select Committee on Brexit and extensive briefings for industry. |
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| <p>Action No. 4.5 APJ 2018 No. 46</p> | <p>Support collaboration across sectors (public and private) to deliver social policy objectives</p> |
| <p>Description</p>  | <p>Examine potential areas for collaboration across Government departments and agencies. Explore SBIR potential in relevant sectors including health.</p> |
| <p>Status</p> | <p>Ongoing</p> |
| <p>Implementation Date</p> | <p>2016 – 2020</p> |
| <p>Lead Responsibility</p> | <p>Research funding Government departments and agencies</p> |
| <p>Progress Update</p> | <p>Small Business Innovation Research (SBIR) enables public sector bodies to address challenges by connecting with businesses to procure research and development on innovative solutions. SBIR Ireland, administered by EI aims to drive innovation across all sections of the Irish Public Sector via robust engagement with technology rich companies. 7 SBIR Challenges were launched in 2017. A further 11 Challenges were approved for 2018 from a wide range of Contracting Authorities including Office of Public Works, Department of Public Expenditure and Reform and Local Councils including Clare, Limerick and Cork City. The SBIR Ireland team have met with Department of Education and HSE with a view to progressing challenge discussions. EI is in advanced discussions with the HSE about a potential challenge launch in Q3 2018.</p> <p>HEA reports that Campus Engage, supported by the IRC, has developed a National Framework for Engaged Research to help researchers collaborate with the public, NGOs and government on ‘Engaged Research’ projects that aim to solve many social issues. Engaged Research emphasises the active involvement of the public and service</p> |

users in the research and innovation process. This has seen, for example, members of the public gathering data on biodiversity in rural Ireland, researchers developing interventions with and for young adults living with diabetes, and efforts to create new products for our ageing demographic. The Higher Education System Performance Framework 2018-2020's System Objective Three regarding research and innovation, as articulated under Action 4.3 above, encompasses 'engaged research' activity and includes several indicators to monitor progress in this regard.

Following the first phase of work on Engaged Research (as above), the **IRC** agreed a funding partnership with the IUA to enable a second phase of work to roll out. Led by Campus Engage, the second phase will generate a range of additional resources and tools for stakeholders to support the embedding of engaged research.

GSI reports that it is currently in discussion with other agencies and social scientists to develop improved policies for the geosciences and increase awareness of the need for integrated research.

MI's open call for Industry-Led Awards 2018 allows for collaborative awards between SMEs and HEI/ Public Sector in marine-related research activities.

SFI's Research Centres are major public-private partnerships which are, in part, progressing social policy objectives. All the Research Centres have a mandate and are resourced to deliver Public Engagement around STEM, supporting the national STEM Education Policy Statement. SFI recently created a new Key Performance Indicator for the Research Centres to track their Education and Public Engagement activities.

The **EPA** has been co-funding environmental research in partnership with the Fulbright Commission, SFI and the IRC. As part of its 2017 & 2018 Annual Research Calls, co-funding was secured from the HSE, the MI, Met Eireann, DAFM, SEAI, Iarnod Eireann, Dublin Airport Authority, Transport Infrastructure Ireland, GSI, Southern Waste Region Authorities, National Parks & Wildlife Services, OPW, Department of Transport, Tourism and Sport, and ERP & WEEE Ireland. The EPA also participated in the Interdepartmental Consultative Committee on Antimicrobial Resistance (AMR) hosted by DOH and DAFM. Companies are eligible for funding under the EPA's Funding rules. Under its 2017 Calls, the EPA provided funded to **seven** companies. **Two** of its 2017 awards involved a collaboration public/private across sectors. Under its 2017 Calls, the EPA has funded several projects in the area of sustainable communities (private & public) and resource efficiency involving for example The Wheel, Community Reuse Network (CRN), Economic & Social Research Institute (ESRI), Your local Food Network, FoodCloud.

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| Action No. 4.6 | Use public service innovation to deliver better outcomes for users of public services |
| Description | Realise the full potential of public service innovation to provide better and more efficient public services. |
| Status | Initiated |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DPER and other Government departments and agencies across all sectors |
| Progress Update | In December 2017, the Department of Public Expenditure and Reform published the Government's public service innovation and development framework, <i>Our Public Service 2020</i> . A core action contained in this document centres around promoting a culture of public service innovation through the implementation of a number of sub-actions and additional initiatives. As part of the governance structure to deliver the headline actions in this plan, the Public Service Leadership Board was established bringing together heads of key Government Departments and chief executives of large public service bodies. This board identified Action 6 (promote a culture of public service innovation) as a priority for implementation across all public service bodies. The oversight of this action's implementation is being jointly led by the Secretary General of DBEI and the CEO of Enterprise Ireland. |

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| Action No. 4.7 | Support national and European open access policies and principles |
|  <p>European Research Area</p> | 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 <i>Find a Research Expert</i>). |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | HEA, KTI, SFI, HRB, DRI |
| Progress Update | <p>DBEI is providing secretariat to the National Open Science Forum, previously the National Steering Committee on Open Access Policy. The Forum has established five working groups that will progress the Open Science Policy Agenda in Ireland across key areas including infrastructure and policy. At EU level, DBEI participates in the European Research Area Standing Working Group on Open Science and Innovation and has contributed to the drafting of the European Commission document on the European Open Science Cloud.</p> <p>All DAFM-funded projects must comply with an Open Access policy for all the outputs arising from the projects. DAFM is a member of the National Open Research Forum.</p> <p>The HRB is active in a number of initiatives under this action, for example:</p> <ul style="list-style-type: none"> 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 |

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| | <p>Open Access Policy. The HRB continues to jointly chair the National Open Research Forum with the HEA.</p> <ul style="list-style-type: none"> • Following intensive work over 2017 the HRB plans to launch an Open Science Publishing Platform, HRB Open Research, in 2018 which will allow HRB researchers to work in a more open manner. This is the first initiative of its kind in Ireland and mirrors a similar platform in the Wellcome Trust. Both platforms are being supported by F1000. • In 2017 the HRB ran two FAIR training workshops and has 2018 plans to facilitate and co-fund an innovative training program for the first professional data stewards in the primary Higher Education Institutions (HEIs) and Clinical Trial Ireland, coordinated by the GO-FAIR International Support and Coordination Office (GFISCO). Participants will be taught how to preserve and curate the data generated through publicly funded health research in Ireland, maximize long-term value of research data, and accelerate discovery impacting health and society. Up to 15 individuals will receive training in the programme. • A detailed data management plan is a mandatory component of all HRB awards, aligned with the FAIR principles. <p>The IRC has integrated best international practice for Open Research in all its funding calls, including a requirement for adherence to the FAIR principles. The requirement for Data Management Plans to be part of submitted proposals for research is being rolled out across Council calls. The Council is a member of the National Open Research Forum.</p> <p>In 2017 KTI launched an on-line 'Find R&D Funding' tool, which will provide organisations with a mechanism to help them source funding and supports for research and development activity in Ireland.</p> <p>SFI continues to mandate that funded researchers make their publications openly available. To facilitate greater interoperability and integration of systems, SFI 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.</p> <p>SFI's use of a unique funder ID (through CrossRef) allows publication datasets to be linked up to its funding data, which has been released under the Open Data Initiative.</p> <p>SFI is a member of the National Open Research Forum. Within this forum, SFI is a member of the Infrastructure Working Group, which is currently exploring how the current Irish research information management system may be improved in a coordinated way.</p> <p>SFI is also a member of the National Research Classification System Working Group and the CrossRef Funder Advisory Group.</p> <p>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.</p> |
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| 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 | DoH |
| Progress Update | <p>DoH 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:</p> <ul style="list-style-type: none"> • 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. • The HRB, in its Strategy 2016-2020 <i>Research Evidence Action</i> has placed focus on support for PI-led clinical trials and interventions and is developing a new suite of calls in this area • A Trials Methodology Research Network, established to facilitate capacity for complex interventions and new trials methodology development in Ireland, received a second Phase of funding from 2017-2021, valued at €1.75m, following an international expert review of progress. • The HRB is also engaging with DOH about Irish membership of the European clinical trials research infrastructure, ECRIN-ERIC. <p>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. HRB will continue to engage with DAFM and other agencies about ensuring standards nationally.</p> <p>A Research Lead has recently been appointed in the HSE whose role is to assist in improving the co-ordination and delivery of health research in Ireland. This appointment is also significant in the context of important actions contained in the Action Plan for Health Research and the commitment to ensure that service delivery is infused and informed by</p> |

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| | <p>the health research activity that is being supported through the HRB, the university base and our clinical research facilities.</p> <p>The EPA has collaborated closely with the Health Service Executive to develop possible research collaboration opportunities in the Environment & Health area. This included the second national conference on environment and health in November 2017 where several 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.</p> <p>In 2017, the EPA (in collaboration with the HSE) has contracted CIRCA to carry out an assessment of knowledge gaps, research needs and areas of opportunity for Ireland in the area of Environmental & Health Research and to develop a road-map for filling these gaps. The EPA 2017 awards included environment & health research-related projects of a value of c. €2.2m, of which €0.6m comes from HSE co-funding.</p> |
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| Action No. 4.9 | Support exceptional researchers, talent and leadership in health research and build a strong enabling environment for Irish health research, nationally and internationally. |
|  <p>European Research Area</p> | <ol style="list-style-type: none"> Support innovative, investigator-led and internationally competitive research to address major health challenges Support the conduct and evaluation of healthcare intervention studies in order to improve health outcomes and health service delivery Support partnership-driven research, information and evidence that meet the needs of the Irish health and social care system. Support exceptional research, talent and leadership in health research. Build a strong enabling environment for Irish health research nationally and internationally |
| Status | a. Ongoing b. Ongoing c. Ongoing d. Ongoing e. Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | HRB |
| Progress Update | <p>The HRB Strategy 2016-2020 <i>Research Evidence Action</i> 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, therefore, 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.</p> <p>In addition to its existing suite of funding mechanisms the HRB developed a number of new initiatives in 2017 to support the HRB Strategy 2016-2020 <i>Research Evidence Action</i> including:</p> <ul style="list-style-type: none"> Funding of 10 Emerging Investigator Awards and 29 Investigator Led Projects to support innovative, internationally competitive research to address major health challenges. Development of a Definitive Interventions (DIFA) scheme to Support the conduct and evaluation of healthcare intervention studies in order |

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| | <p>to improve health outcomes and health service delivery, with 10 awards made in 2017 and further awards planned for 2018 and 2020.</p> <ul style="list-style-type: none"> • 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 • Development of a four-year Implementation Research Funding Evaluation Plan (2017-2020) to enhance monitoring and evaluation of HRB investment. In 2017 the HRB published a bi-annual report on the Outputs and Outcomes of HRB awards that finished in 2015/2016 and a Bibliometric study (with CWTS Leiden) on Peer-reviewed Publications supported through HRB funding 2013-2016. |
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| Action No. 4.10 | 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. | |
| <p>Description</p>  <p>European Research Area</p> | <p>a. Establish a national Health Innovation Hub Ireland (HIHI). b. Explore and develop collaborations in the context of the eHealth Strategy for Ireland¹ and the Knowledge & Information Strategy.</p> | |
| Status | a. Completed 2016 | b. Ongoing |
| Implementation Date | <p>a. 2016 b. 2016 – 2020</p> | |
| Lead Responsibility | <p>a. DBEI, DoH b. DoH and HSE</p> | |
| Progress Update | <p>a. Refer to First Progress Report. HIHI works across healthcare and Irish businesses to solve problems, improve the health services and in the process, helps to create jobs and exports. HIHI offers companies the opportunity for pilot and clinical validation studies and the health service access to innovative products, services and devices that they may not otherwise be exposed to.</p> <ul style="list-style-type: none"> • HIHI has conducted 56 company engagements through its Innovation In Programme, leading to 23 HIHI Projects. 11 of these projects resulted from the HIHI Call in 2016 and the balance have come to HIHI through the Open-Door Process. • HIHI has established projects in 13 clinical locations and has engaged with more than 50 clinical staff including nurses, consultants, IT staff, biomedical engineers, allied health professionals and administration and management staff. • Under the Innovation Out programme, HIHI has received 44 concepts from individuals working within or close to healthcare. HIHI has had 31 engagements with the innovators involved in these projects and has conducted 13 Technology Assessments. • HIHI launched its second focused call for projects in June 2018. <p>b. In the context of the eHealth Strategy for Ireland and the Knowledge & Information Plan, the reorganised HSE ICT management function is</p> | |

¹ eHealth Strategy: Bringing improved population wellbeing, health service efficiencies and economic opportunity through the use of technology enabled solutions, Dept of Health Dec 2013

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| | <p>now in a stronger position to explore the numerous opportunities provided by modern eHealth capability to improve the health service delivery and the eHealth Ireland Advisory Committee also includes representatives of academia and the enterprise sector.</p> <p>eHealth Ireland's ecosystem brings together communities and connects stakeholders in academia, enterprise, service delivery and policy through a comprehensive programme of events, consultations and roundtables to explore and develop collaborations as part of the eHealth Strategy. The most recent ecosystem events brought together clinical, research and digital stakeholders on such topics as <i>Mental Health and Wellbeing</i> (Sept 2017), <i>Partnering with Patients for Healthcare Innovation</i> (Oct 2017) and <i>eHealth Innovations for Home and Community Care</i> (Apr 2018). A 2nd Joint Ecosystem event was also held with Northern Ireland (Jan 2018) which explored areas of collaboration in the context of eHealth, maximising healthcare efficiencies through technology, ICT interoperability & standardisation and system design.</p> <p>eHealth Ireland has also hosted <i>Health Innovation Week</i> in 2016 and 2017 which runs a series of interactive events for clinicians, researchers, enterprise, academia and service users that encourage creation, learning and collaboration by showcasing healthcare innovations.</p> |
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| 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 | Completed 2017 |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DAFM |
| Progress Update | Refer to Second Progress Report. |

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| 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 (Sustainable Healthy Agri-food Research Plan). |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DAFM |
| Progress Update | DAFM will announce in late Q2 2018 details of substantial expenditure on a number of new research projects addressing this action arising from DAFM's 2017 Research Call. The areas to be funded will align with priority investment areas identified in the SHARP strategic research and innovation agenda that gives effect to the two main food related research priority areas. |

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| | <p>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). The EPA and DAFM are co-funding a Water JPI project (EUTROSED), led by TCD in this area. DAFM is also co-funding 2 of the topics included within the 2017 EPA Research Calls (under Climate & Water Calls); and the EPA has also agreed to co-fund one project under the 2017 DAFM Calls. Co-funding for DAFM has also been secured for 2 of the topics included in the 2018 EPA Research Calls.</p> <p>In addition, the EPA has liaised with DAFM via its Sustainability, Climate & Water Research Coordination Groups, as part of its role in coordinating environmental research in Ireland. In line with the objectives of FoodWise 2025 and the EPA's Strategic Goals, the EPA has continued to support the Smart Farming initiative.</p> |
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| 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. | |
| Description  European Research Area | a. Review agri-food sector innovation capacity b. Review coordination of agri-food research technology centres. | |
| Status | a. Ongoing | b. Initiated |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | a. EI, DAFM, Teagasc, (MI) b. EI, SFI, DBEI & DAFM | |
| Progress Update | a. DAFM have established a High Level Innovation Team which was launched on May 10th, 2018. The team has undertaken to review agri-food sector innovation capacity and capability and will report to the FoodWise High Level Implementation Committee by Q2 2019 with a view towards contributing to future agenda setting & strategic efforts. b. In March 2018, DAFM, EI & SFI coordinated an information visit for the EI/SFI agri-food research technology centres to Brussels to meet key EU Commission officials (Agri, R&I, Biobased Industries) with regards to EU Research & Innovation Funding opportunities. | |

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| Action No. 4.14 | Improve capacity of agri-food companies to absorb research and innovation output from research bodies. | | | | |
| Description  European Research Area | 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 | a. Nearly complete | b. Ongoing | c. Nearly complete | d. Ongoing | e. Ongoing |
| Implementation Date | 2016 – 2020 | | | | |
| Lead Responsibility | a. Teagasc b. Teagasc c. Teagasc d. DAFM, IRC e. DAFM (lead) SFI, Teagasc | | | | |
| Progress Update | a. The Proposal to build a national Food Innovation Hub has been agreed and is at the design phase of development. Since realisation of the concept, interest has remained high, stimulated by increased public-private partnerships and demand for innovation in an evolving global food supply chain. The initiative is underpinned by investment in number of new projects including 'cheese for china', 'dairy dry; funded by Department of Agriculture, Food & Marine;' and use of the latest molecular techniques for food safety, i.e., 'from production to consumption'. Emphasis has also been placed on the area of 'Process Analytical Technology; PAT' within the food programme through the recruitment of a research scientist and award of newly funded projects. b. New research has been undertaken in the area of food digestion and health. This includes initiation of collaborative projects with the food industry. A new in-vitro digestion methodology, developed through an EU-cost action project led by Teagasc , has been published and adapted for use by national and international academia and industry. New research, led by Teagasc, in food digestion and health will also take place as part of a new SFI-DAFM funded Agri-Tech Centre that is due to commence in September. In other developments, extensive studies have taken place to elucidate and harness the health-promoting attributes of fermented foods and associated microbes. The work builds on the strengths of APC Microbiome Ireland, Food for Health Ireland, University College Cork and Teagasc. A fifth department has also been established in the food programme entitled the 'Food Quality and Sensory Science' to enhance capabilities of industry to develop healthy, nutritious and shelf-stable meats, cereals and other consumer foods. Current investments have led to the use of digital technologies such as imaging and virtual / augmented reality for understanding food structure, which is intrinsically linked to quality- and health-related attributes of food. | | | | |

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| | <p>c. A new €10 million expansion has been initiated at Moorepark Technology Limited at the Moorepark research centre site in Fermoy, Co. Cork. The expansion will see a considerable increase in client work and ability to deliver new innovations for the food processing sector. One example is the introduction of new approaches to drying foods - underpinned by the research programme at Teagasc through the recent recruitment of a scientist in the area of dehydration of food and through successfully awarded research projects in the area.</p> <p>d. To date DAFM has committed approx. €750,000 to the IRC for the funding 7 MSc and 9 PhD placements in agri-food, forestry, fisheries and bioeconomy enterprises. DAFM has continued to partner with IRC in the 2017 employment based Research programme. IRC's Employment-based Programme Call is currently in process. 35-40 awards will be made, and agri-food will be a prominent area within the award portfolio.</p> <p>e. DAFM reports that the current Agri-Food Graduate Development Programme (2014-2018), which is operated by a consortium involving UCC, UCD and Teagasc, is ongoing and funded until November 2018.</p> |
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| 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 and in non-food bioeconomy activities. |
| Status | Nearly complete |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DAFM, (and MI, Teagasc, BIM), DCCAE (EPA, SEAI), SFI, EI |
| Progress Update | <p>DAFM will announce in late Q2 2018 details of substantial expenditure on a number of new research projects addressing this action arising from DAFM's 2017 Research Call. The areas to be funded will align with priority investment areas identified in the SHARP strategic research and innovation agenda that gives effect to the two main food related research priority areas.</p> <p>DCCAE reports that funding of biobased research will continue to be provided by existing funding streams, e.g. the EPA Research Programme.</p> <p>MI reports that Investment under the EU Marine Biotechnology ERA-NET three projects funded total grant-aid of €900k to six Irish partners, including two industry partners. These projects aim to extract and purify high value-added components from marine bioresources e.g. seaweed.</p> <p>National Marine Biodiscovery Laboratory - This consortium (NUI Galway, University of Limerick and University College Cork) builds on the previous Beaufort Marine Award. Organisms collected in the maritime areas of Ireland from the intertidal zone until the deep sea will be sent to the NMBL for storage, curation and identification. They will feed an existing repository of taxonomically identified Irish marine species. Additionally, part of the samples will be processed to prepare fractions leading to small molecules, peptides and proteins of added value. Finally, a biobank and a chemical library of marine products will be hosted at the NMBL and</p> |

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| | <p>will be made available to the research community through an online database. Total grant-aid €900k over 3 years from March 2017.</p> <p>The SEAI RD&D Funding Programme provides an opportunity for applicants to apply for funding for this area. The 2017 Programme included a number of topics which specifically address bio-based economy activities.</p> <p>Almost all of Teagasc's Walsh Fellowships funded in 2018 were in the areas of bio-based economy, rural development and reducing losses along the food chain.</p> <p>The EPA has funded new projects relevant to the bio-based economy. The EPA reviewed its portfolio of ongoing research projects during the January 2017 Scoping Exercise on the Bio-Economy. 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). As part of its new 2017 awards, the EPA co-funded a Fulbright Fellowship on the Bio-Economy as well as a Medium-Scale project on An Irish nutrient platform to underpin sustainable development.</p> |
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| Action No. 4.16 | Develop a national bio-economy strategy |
| Description | Develop a bio-economy strategy to identify opportunities for Ireland to build innovative enterprises to address the global requirement for replacing fossil-derived consumer goods with bio-based alternatives. |
| Status | Completed 2018 |
| Implementation Date | 2017 |
| Lead Responsibility | DT, DAFM, DCCAE, relevant funders, (Teagasc) |
| Progress Update | The National Policy statement on the Bioeconomy was launched by D/Taoiseach in March 2018. The first meeting of the Implementation Group, co-chaired by DAFM and DCCAE , was in May 2018. Among its tasks are ensuring there is a coherence between all sectoral strategies on the bioeconomy; to encourage the translation of research into real world applications and to progress the leading value chain propositions in the BioEire project. |

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| Action No. 4.17 APJ 2018 No. 19 | Support progress towards the <i>Harnessing Our Ocean Wealth</i> targets through coordinated marine research and development strategies | |
| Description |  <ul style="list-style-type: none"> 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 | a. Completed 2017 | b. Ongoing |
| Implementation Date | 2016 – 2020 | |
| Lead Responsibility | Marine Institute Funding departments and agencies | |

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| <p>Progress Update</p> | <p>a. The National Marine Research & Innovation Strategy 2017-2021 was published and launched by the Minister for Agriculture, Food and the Marine at the Harnessing Our Ocean Wealth Summit on 30th June 2017.</p> <p>The strategy identified 16 key implementing actions. The Marine Institute completed Action 4 – Research Equipment and Small Infrastructure Call in 2017, with an investment of €2.5 million for 19 awards – 14 to the Higher Education Sector and five to Industry. On 3rd May 2018, the first meeting of the Marine Research Funders Forum was held, where national funders were given an opportunity to share information on their current funding programmes and to discuss potential co-funding opportunities.</p> <p>The first meeting of the Marine Infrastructures Providers Forum is planned for September 2018.</p> <p>The Marine Institute’s Industry-Led Call 2018 is designed to provide opportunities for SMEs to participate in marine research (Action 8). The call results will be announced at the start of Q4 2018, with an expected investment of €2m.</p> <p>The EPA and the MI 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 is also cofunding topics from the 2017 & 2018 EPA Research Calls.</p> <p>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; and has been invited onto the National Marine Research Funders’ Forum.</p> <p>SEAI is actively involved in these fora through its ocean energy team.</p> <p>b. The MI Industry-led call in 2018 (4.17a above) is a key component of the strategy to enhance the research capabilities within SMEs, supporting progress in the development of marine-related products and services for indigenous and export markets. A budget of €2m euros has been allocated by the MI to fund Industry-led projects up to a maximum award of €200,000 per project.</p> <p>In 2017, the Marine Institute is advancing plans to implement a new National Coordination function for R&I coordination and Knowledge Transfer in Advanced Marine Tech and Blue Biotech. That coordination will align with efforts of the Marine Development Team linking the R&I Strategic Coordination with business development.</p> <p>Páirc na Mara is a new marine innovation park which is to be developed by Údaras na Gaeltachta at Cill Chiaráin in the Conamara Gaeltacht of County Galway. The nine-hectare development site will provide the infrastructure and facilities to support the establishment and expansion of a cross-section of marine enterprises. These enterprises will develop innovative marine products and services creating employment, economic regeneration and added value through targeting national and export markets.</p> <p>Páirc na Mara forms part of a new marine research cluster which also includes NUI Galway Carna Campus Laboratories, and an aquaculture site in Beirtreach Buí near Carna. The Connemara cluster, in turn, will form part of a national aquaculture research cluster which includes the Marine Institute facilities at Newport, Co. Mayo, with the Beirtreach Buí site will be an important part of the States marine research infrastructure.</p> |
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| | In 2017, Enterprise Ireland funded a Marine Incubator Manager. Appointed in 2018 and based in the MaREI facility in Cork, the Manager has a nationwide remit to support start-up companies in the Marine sector to bring them to the point where they will be commercially viable. |
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| Action No. 4.18 | Implement the actions identified in <i>EPA Research Strategy 2014–2020</i> |
| 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 | <p>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.</p> <p>Environmental Research Programme 2014-2020 The EPA’s Research Programme 2014-2020 is designed to identify pressures, inform policy and develop solutions to environmental challenges through providing strong evidence-based scientific knowledge. The research programme is based around “three pillars” (climate, water and sustainability), representing the key research priorities associated with delivering a protected Irish environment.</p> <p>EPA Research Activities 2017-2018 In 2017, the EPA published 38 EPA research reports and committed €11.2 million to fund new research projects. These included: 31 projects on the topics of Water (8), Climate (8), Green Enterprise (3) and Sustainability (16); three new PhDs via the IRC-EPA Scholarship Scheme; two projects co-funded via the SFI-EPA Investigator Programme; two Fulbright-EPA awards; five transnational projects under the Climate & Water Joint Programming Joint Calls.</p> <p>Since January 2018, 11 EPA Research reports have been published. The EPA has a budget of €10.9m in 2018, with just over €9.4m for new commitments towards new research awards in 2018. In April 2018, the EPA launched its 2018 Annual Research Calls – with a closing date of 27th June 2018.</p> <p>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:</p> <ul style="list-style-type: none"> • Increasing awareness, synergies and communication amongst Irish research funders; and • Coordinating and reducing the fragmentation of environmental research in Ireland. |

The EPA is also co-funding environmental research in partnership with the Fulbright Commission, Science Foundation Ireland, and the Irish Research Council. As part of its 2017 & 2018 Annual Research Calls, co-funding was secured from the Health Service Executive, the Marine Institute, Met Eireann, Department of Agriculture, Food and the Marine, Sustainable Energy Authority of Ireland, Iarnod Eireann, Dublin Airport Authority, Transport Infrastructure Ireland, Geological Survey of Ireland, Southern Waste Region Authorities, National Parks & Wildlife Services, Office of Public Works, Department of Transport, Tourism and Sport, and ERP & WEEE Ireland. 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 the EU's Horizon 2020 research programme, Societal Challenge 5 (Climate action, environment, resource efficiency and raw materials). In 2017, the EPA supported Irish environmental researchers in securing over €4 million in funding for environmental research under Horizon 2020 SC5. A webinar with DG Research for Horizon 2020 SC5 was held on the 27th November 2017. In addition, roadshows were held in 2017 in third level institutions. The EPA is also the National Delegate for the EU's EURATOM programme.

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: WaterWorks2017, WaterWorks2015, WaterWorks2014 ERAnet COFUND actions and IC4Water Coordination Support Actions.
- Climate Joint Programming Initiative (chaired by the EPA since 2017) and associated EC-funded Horizon 2020 projects (ERA4CS & AXIS ERAnet COFUND actions and SINCERE Coordination Support Action).
- VERIFY Coordination Support Action (as a partner).
- BiodivERsA: The EPA became an Observer in the network in late 2016 and a full partner in 2018; and participated in the ERAnet COFUND action (BioDivScen).
- EnvHealth: (network of funders in Environment & Health).
- Share '5 Agencies' Programme (involving the Irish and UK EPA's).
- CONCERT European Joint Programme (which the EPA joined in 2018).

The EPA Research programme has an active communications programme. Communication and dissemination activities arising from EPA-funded research are strongly encouraged and monitored throughout the lifetime of funded projects. In addition, EPA-funded projects must comply with an Open Access and Open Data policy for all the outputs arising from the projects.

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| 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 (NDRC) |
| Status | Ongoing |
| Implementation Date | Ongoing |
| Lead Responsibility | DCCAE |
| Progress Update | <p>Last year DCCAE engaged Indecon International Economic Consultants to undertake an independent review of the policy underpinning the NDRC programme.</p> <p>The review found that the investment in the NDRC programme has been effective with estimated net economic benefits of €73.5m. The report highlights that NDRC-supported companies have created over 680 high value jobs in Ireland and have secured follow-on investment of €152m.</p> |

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| Action No. 4.20 | Implement research-related actions in the forthcoming <i>Energy White Paper</i> and <i>Energy Research Strategy</i> |
| 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 | <p>In January 2018, DCCAE commissioned a high-level study into the Irish National Gas Network, to address issues relating to the wider economic costs and benefits of potential extensions to the Irish natural gas network, including decarbonisation, air quality, climate and emissions and regional and rural development benefits. In September 2017, the Commission for Energy Regulation announced its delivery plan for smart meters in Ireland, as laid out in the Energy White Paper, to commence in 2019.</p> <p>SEAI's RD&D Funding Programme supports innovative and targeted actions which assist in delivery of the National Energy Efficiency Action Plan (NEEAP), the National Renewable Energy Action Plan (NREAP), the National Mitigation Plan goals and the 2015 Department of Communications, Climate Action and Environment Energy White Paper.</p> <p>In the 2017 EPA new awards, c. €1.6m was awarded for new energy-related projects (including co-funding received from SEAI). Energy-relevant topics were also included as part of the 2018 EPA Research Calls and co-funding was secured from SEAI towards the 2017 & 2018 EPA awards.</p> |

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| Action No. 4.21 | Implement <i>Geoscience Research Strategy</i> |
| Description | Implement actions identified in <i>Geoscience Research Strategy 2015–2020</i> |
| Status | Ongoing |
| Implementation Date | 2020 |
| Lead Responsibility | DCCAE/GSI |
| Progress Update | <p>Continued development of GSI's research programme including external collaborations and co-funding of research in Ireland.</p> <p>The EPA has also agreed to co-fund with the GSI the Irish participation under the EU ERAMin Joint Call. As part of its 2017 new awards, three projects relevant to the GeoScience Strategy were funded: Raw materials Ireland; Distribution of metal ions in ground & surface water, soils and plants in South East Ireland; Towards a higher resolution national risk map: Incorporating multiple covariates to develop a new spatial model of indoor radon levels. Co-funding from the GSI was secured for the 2017 & 2018 EPA Research Calls.</p> |

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| 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 | Nearly complete |
| Implementation Date | 2017 |
| Lead Responsibility | DCCAE, GSI |
| Progress Update | <p>GSI has signed a New Memorandum of Understanding with ESRI. A new Horizon2020 project including ESRI, GSI, academic, SME and international mining company will start in June 2018 specifically focused on economic and social impact of mining & risk perception. GSI continues to support the Geoscience Ireland business cluster, Institute of Geologists of Ireland etc.</p> |

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| Action No. 4.23 | Complete INFOMAR, National Marine Mapping Programme |
| Description | Implement Phase 2 of INFOMAR, 2016-2026 to complete mapping of all Irish waters |
| Status | Ongoing |
| Implementation Date | 2026 |
| Lead Responsibility | DCCAE, GSI & MI |
| Progress Update | <p>MI report that IMFOMAR is on target to complete mapping, but reduced programme resourcing 2009 – 2016 has impacted programme outputs, and now requires mapping prioritisation (sub-programme 1) through to programme end, over data and value-added exploitation activities (sub-programmes 2 & 3).</p> <p>In 2017 the MI completed six seabed mapping surveys under the INFOMAR Programme (Integrated Mapping for the Sustainable Development of Ireland's Marine Resource) with a total of 91 survey days (27 days on the Celtic Explorer and 64 days on the Celtic Voyager).</p> |

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| | <p>The survey area for the R.V. Celtic Voyager was the Celtic Sea, extending coverage south of Waterford and Wexford and the survey area for the R.V. Celtic Explorer was the Celtic Sea, extending coverage within the Biologically Sensitive Area. Coverage achieved exceeded 4300 km², during 13,182 survey line kilometres.</p> <p>The 1:100,000 chart series was created for the entire coastline of Ireland along with an interactive web map service to simplify access and download of same. Digital tile services were also created with rapid access bathymetry and contour data now online for ingestion by software developers. Significant data compilation and processing has been achieved with backscatter and habitat data resources now also regionally accessible online.</p> <p>International & Irish research activity has been extensive, with work ongoing on EMODnet Habitat and DGMARE Pro-Atlantic projects, and INTERREG & H2020 proposals in development, as well as national collaborative programmes including the EMFF Geogenic Reef project being progressed.</p> <p>The programme is progressing with new GSI vessels (RV Mallet and RV Lir) surveying in 2018.</p> |
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| Action No. 4.24 | Complete TELLUS Programme |
| Description | Complete TELLUS, national coverage of airborne geophysics and ground geochemistry as national environmental baseline |
| Status | Ongoing |
| Implementation Date | 2023 |
| Lead Responsibility | DCCAIE, GSI |
| Progress Update | GSI reports that there were data launches in 2017 and 2018 with further data expected to be available in Q3 2018. |

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| Action No. 4.25 | 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 | a. Nearly complete | b. Nearly complete |
| 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 being finalised which will continue the work already underway in supporting Irish Enterprise and research institutes. A policy on intellectual property rights and endorsement for the Defence Organisation is progressing which will protect and develop the | |

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| | <p>organisation's interests while creating an environment which stimulates innovation and encourages industry to collaborate with the Defence Forces.</p> <p>Both are progressing with an expected completion date in 2018.</p> |
| 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 | Delayed |
| Implementation Date | 2016 |
| Lead Responsibility | D/Defence |
| Progress Update | D/Defence report that this is scheduled to be completed mid-2019, however this is very much dependant on the development of an IP Policy for the Defence Organisation. A project team is currently working on the IP policy and it is envisaged that it will be signed off in the next couple of months. Actions taken so far include formal contact with EI and exploratory discussions. |

The Role of Intellectual Property in Innovation

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| Action No. 5.1 | Publish a revised IP Protocol to ensure that the Irish protocol remains 'best in class' |
| Description | A revised IP Protocol will be published in 2016 incorporating feedback from industry and other stakeholders on issues identified in operating to the current protocol |
| Status | Completed 2016 |
| Implementation Date | 2016 |
| Lead Responsibility | DBEI, KTI |
| Progress Update | Refer to First Progress Report |

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| Action No. 5.2 | Provide additional resources and tools to improve industry-academic collaboration |
| Description | Expand resources and tools for enterprise to engage with the public research system and to access IP, including model agreements, practical guidelines and improved information on expertise within the public research system. |
| Status | Completed 2017 |
| Implementation Date | 2016 |
| Lead Responsibility | KTI |
| Progress Update | Refer to Second Progress Report |

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| Action No. 5.3 | Encourage commercialisation of publicly-funded research |
|  <p>European Research Area</p> | <p>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:</p> <ol style="list-style-type: none"> Commercially relevant technologies (Licences, Options, Assignments): 175 (per annum by 2020) Spinouts: 40 (per annum by 2020) High Potential Start Ups (HPSUs) from Spinouts: 16 (per annum by 2020) 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 | <p>EI continues to drive the commercialisation of research, and technology transfer through KTI and the targets set for 2020 should be achieved. Below are the year-end outturns for 2017.</p> <ol style="list-style-type: none"> 164 for Licences Options, Agreements and Assignments 22 Spinouts 15 HPSUs from Research 1,078 Collaborative Research Projects between enterprise and the public research system |

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| | <p>Under the SFI Technology Innovation and Development Award (TIDA) 2017 programme call, SFI made awards to support 39 applied research projects deemed by international peer review to have strong commercial potential. As part of this programme, awardees will also have the opportunity to undertake innovation and entrepreneurship skills training as part of the SFI Spark Pre-Accelerator run in collaboration with the DCU Ryan Academy for Entrepreneurs.</p> <p>As part of the inaugural call of the SFI/NSF I-Corps@SFI Entrepreneurial Training Programme which is run in partnership with the US National Science Foundation (NSF), SFI funded 8 teams to complete entrepreneurship training as part of the NSF I-Corps Curriculum in the United States.</p> |
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| 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 | Completed 2017 |
| Implementation Date | 2017 |
| Lead Responsibility | DBEI, EI |
| Progress Update | Refer to Second Progress Report |

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| Action No. 5.5 | 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 | Completed 2017 |
| Implementation Date | 2017 |
| Lead Responsibility | DBEI, EI with IUA |
| Progress Update | Refer to Second Progress Report. KTI operations have been reviewed, extra resourcing endorsed, with EI and DBEI to move forward. |

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| Action No. 5.6 | Raise IP awareness |
|  <p>European Research Area</p> | 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 | During 2017, DBEI's Patents Office participated in 60 events speaking on IP at “Start your own business” courses run by the Local Enterprise Offices. The Office engaged in IP awareness raising activities at various business advice and enterprise exhibitions throughout the country, including the All Ireland SME Summit, the National Ploughing |

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| | <p>Championships and at the Medical Technology Ireland event in Galway. Additionally, the Office co-hosted an IP seminar with EI in Dublin as well as taking part in the National Research & Innovation Expo and various events including the Business Support Showcase during Enterprise Week. The Office also held 47 IP clinics in 2017, which give an opportunity to the public, inventors, entrepreneurs and business people to discuss on a one-to-one basis with Patents Office staff, matters concerning IP applications they intend to make or have already made to the Office.</p> <p>To May 2018 the Office has undertaken 23 IP awareness raising activities in support of business and has held 28 IP clinics.</p> |
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| Action No. 5.7 | Build IP capability and resilience at enterprise level |
|  <p>European Research Area</p> | <p>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.</p> |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | EI, DBEI with relevant agencies |
| Progress Update | <p>EI's Intellectual Property Strategy Offer is currently live. The IP Strategy Offer (pilot) is designed to complement existing EI RD&I offers by supporting clients to develop an IP strategy around linked EI supported RD&I projects. The offer will give financial assistance to clients to access external IP expertise and develop in-house IP capability with a view to developing a strategy to capture and exploit more of the value of their RD&I. It comprises two grants IP Start and IP Plus.</p> <p>IP Start is a relatively small grant to cover a portion of the cost of employing an external IP consultant for a short engagement (maximum 3 days at a daily rate of €900 per day) to raise awareness and address immediate IP issues. The duration of IP Start assignments will be limited to 4 months and may be grant aided up to 80% of eligible expenditure. The primary focus of the grant is to support an R&D Technical Feasibility, but other scenarios are possible depending on client needs and nature of the linked RD&I activity. Applications will be accepted from the following categories of EI SME clients:</p> <ol style="list-style-type: none"> 1. Recipients in-company RD&I supports 2. Industrial partners in innovation partnership programme projects 3. Innovative HPSUs 4. Awardees of H2020 SME instrument Phase 1 funding <p>IP Plus is a grant toward the cost of a longer-term assignment to develop a detailed IP strategy with a focus on a linked EI supported RD&I project. The grant will provide financial assistance to: a) engage external IP consultant(s) (at a cost of €900 per day maximum) to address identified strategic IP issues and b) allocate a part time internal IP champion to work closely with the consultant and develop the internal IP capability of the business. This grant focuses on full scale RD&I activities and aims to address a range of IP strategic issues including: awareness; competitive</p> |

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| | intelligence; processes and documentation; policy; data security; exploitation; protection etc. IP Plus assignments will run concurrently with the EI supported RD&I project or in the case of RD&I projects completed within the preceding 7 years assignments will be limited to 18 months in duration. Eligible expenditure for IP Plus assignments is limited to a maximum of €70,000, with a maximum grant rate of 50%, and applications will be accepted from EI SME clients that are either: <ol style="list-style-type: none"> 1. Recipients in company RD&I supports, or 2. Industrial partners in innovation partnership programme projects |
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| 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 | Delayed |
| Implementation Date | 2017 |
| Lead Responsibility | HEA/DES |
| Progress Update | The Higher Education System Performance Framework 2018 – 2020 has a metric under student enterprise and employability on IP awareness and education modules by level and discipline. This will be monitored as part of the HEA’s annual Strategic Dialogue process with the institutions. Metrics / information on IP education within the HEIs should be available before the end of 2018. |

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| Action No. 5.9 | Measure progress of IP activity in firms |
|  <p>European Research Area</p> | Develop an approach for measuring and monitoring progress of IP activity in the firm base. |
| Status | Delayed |
| Implementation Date | 2017 |
| Lead Responsibility | Inter-agency group at Action 5.7 |
| Progress Update | In August 2016 EI 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” proposes a methodology for measuring and monitoring progress and will be reviewed at the next meeting of the Inter-agency group. |

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| 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 | Nearly complete |
| Implementation Date | 2016-2017 |
| Lead Responsibility | DBEI |
| Progress Update | The Copyright and Other Intellectual Property Law Provisions Bill 2018 is a response to the report of the Copyright Review Committee entitled "Modernising Copyright". It aims to modernise the copyright regime in Ireland and to take account of changes needed to adapt to the evolution of the digital age. It will also introduce certain exceptions to copyright permitted under the Information Society Directive (2001/29/EC). The Bill has completed all stages in Dáil Éireann and it is expected that it will be enacted in Q4 of 2018. |

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| Action No. 5.11 | Improve patenting options for business |
|  <p>European Research Area</p> | 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 | Delayed |
| Implementation Date | 2016-2017 |
| Lead Responsibility | DBEI |
| Progress Update | While the required number of ratifications (13) has been reached, of the 3 mandatory ratifications, i.e. France, Germany and the UK, only Germany has yet to ratify. The ratification process has been delayed in Germany pending the outcome of a constitutional challenge. Pending a decision from the German Constitutional Court, a start date for the UPC to come into operation is difficult to predict. |

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| 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 | Nearly complete |
| Implementation Date | 2016-2017 |
| Lead Responsibility | DBEI, DJ&E |
| Progress Update | The Copyright and Other Intellectual Property Law Provisions Bill 2018 provides for the extension of the jurisdiction of the Circuit Court and the District Court to facilitate intellectual property infringement claims for relief in civil proceeding within the monetary jurisdiction of those Courts. The Bill is currently progressing through the Houses of the Oireachtas, and has completed all stages in Dáil Éireann. It is expected that the Bill will be enacted in Q4 of 2018. |



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| Action No. 5.13 | Support the Knowledge Development Box |
| Description | Develop outline scheme and attendant legislation to support the Knowledge Development Box for qualifying IP assets. |
| Status | Completed 2017 |
| Implementation Date | 2016 |
| Lead Responsibility | DBEI, Patents Office |
| Progress Update | Refer to Second Progress Report |

Innovating with the EU and the Wider World

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| Action No. 6.1 APJ 2018 No. 52 | Secure €1.25bn in funding from Horizon 2020 | |
| Description   European Research Area | 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 | <p>Ireland's drawdown up to the end of February 2018 was €513 million. The largest (and last) Work Programme was launched in October 2017, and contains €30 billion in funding. All of the organisations involved in the High Level Group are actively targeting this work programme to maximise Ireland's return.</p> <p>Higher Education Institutions accounted for 53% of the total and private companies won 34%. SMEs received 61% of the funding to companies. This performance has Ireland on track to achieve the national target.</p> | |
| Action No. 6.2 | Catalyse the creation of and participation in consortia to bid for large-scale Horizon 2020 projects | |
| Description  European Research Area | 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 | a. Ongoing | b. 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. EI launched a Large Scale Support Call for Horizon 2020 Initiatives in December 2017, which provides up to €100,000 to support the preparation of targeted, large scale activities in Horizon 2020. b. The Horizon 2020 National Support Team continues to provide support and funding for participation in large scale Horizon 2020 bids. Officials continue to engage with the High Level Group and all stakeholders are currently undertaking exercises to ascertain whether additional large scale opportunities might be targeted, particularly where more than one sector may be involved. | |

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| 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 | Ongoing |
| Implementation Date | Through-out lifetime of Horizon 2020 |
| Lead Responsibility | Horizon 2020 National Support Network, Irish Permanent Representation Brussels, Irish Research Community |
| Progress Update | <p>Engagement with the Commission is ongoing in respect of the implementation of the Horizon 2020 Work Programme, through the engagement of the Horizon 2020 National Support Network and the Department's representation on the Strategic Configuration Committee for H2020.</p> <p>Following a consultation with national stakeholders, government departments and agencies, DBEI published its position paper on Framework Programme 9 – now known as Horizon Europe – in August 2017. The paper was presented to the European Commission in February 2018.</p> <p>DAFM, through its National Delegate and National Contact Point are active in working to influence the work programme of H2020 and FP9 to facilitate the participation of Irish researchers.</p> <ul style="list-style-type: none"> • Work with DBEI, the National Support Network and permanent representatives in Brussels to monitor and influence the EU SC-2 agenda including engaging in the development of the Agri-Research & innovation, Food 2030 & Bioeconomy policy developments • Facilitate national researcher consultations to influence biannual H2020 work programme content • Participate in Programme Committee, Biobased Industries State Representative Group & Standing Committee on Agricultural Research to advocate for Irish research needs and ensure timely updates of research community. <p>The HRB through its National Delegate and National Contact Point for Health are very active in working to influence the work programme of H2020 and Framework 9 to facilitate the participation of Irish researchers. Examples of activities include:</p> <ul style="list-style-type: none"> • Work with DBEI, the National Support Network and permanent representatives in Brussels to monitor and influence the EU health research agenda • Facilitate national researcher consultations to influence biannual H2020 work programme content • Participate in EU Health Programme Committee to advocate for Irish research needs and ensure timely updates of research community • Input to mid-term H2020 review consultation • Coordinate and submit national inputs to EU policy/ legislative consultations that could impact on Irish research, including EU Copyright Directive, SE TDM position, H2020 impacts, Data Protection Regulations, Clinical Trials Regulations • Ensure that the Department of Health and other agencies are aware of the implications of legislative initiatives through briefing of |

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| | governmental personnel, coordinated responses, and engaging with key stakeholders on developments. |
| Action No. 6.4 | Assess EFSI potential for funding for research and innovation in Ireland |
| Description | Investigate the potential of national initiatives to engage with EFSI. |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI |
| Progress Update | In April 2018 DBEI entered into a contract with the European Investment Bank (EIB), specifically the European Investment Advisory Hub part of the EIB, to conduct an assessment of Research & Development Funding for Third Level Institutes in Ireland. The EIB appointed a contractor with expertise in third level and innovation funding models to conduct an assessment that would enable it to evaluate new funding models and to identify additional sources of finance; the aim is to increase the level of R&D in the Third Level Institutes in Ireland. The study will run through summer 2018 and a final report will issue to the Department in September 2018. |
| Action No. 6.5 | Ensure full benefit to Ireland from European Structural and Investment funding for research and innovation |
| Description | Participate fully in ERDF and ETC programmes. |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI |
| Progress Update | <p>EI has six programmes that qualify for ERDF co-funding:</p> <ul style="list-style-type: none"> • Priority 1: strengthening research, technological development and innovation <ul style="list-style-type: none"> • Industry R&D Fund in Border, Midlands and West (BMW) region • Commercialisation Fund in BMW and South and Eastern regions • Innovation Partnerships in BMW and South and Eastern regions • Priority 3: enhancing the competitiveness of SMEs <ul style="list-style-type: none"> • New Frontiers in BMW region • Capacity in BMW region • LEOs in BMW and South and Eastern regions <p>MI plan to commit €5m for research co-funded under ERDF from 2018 to 2020. An investment of €2m in 2018 for an industry-led call, followed by €3m for post-doctoral fellowships, capacity-building research projects and networking/technology transfer activities in 2019 and 2020. The first expenditure declaration is scheduled for 2020. MI is also one of the co-funding partners for Science Foundation Ireland's Investigators Programme, providing co-funding for five successful awards to date that are co-funded under ERDF.</p> <p>SFI participates in the two ERDF 2014 -2020 Operational Programmes:</p> <ol style="list-style-type: none"> 1. The BMW OP – run by the Northern & Western Regional Assembly – the Research Centres INSIGHT and CURAM, any related SPOKES |

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| | <p>awards (but none awarded yet) plus all investigator awards made to RBs in the region – e.g. NUIG, are eligible for ERDF Co-Funding.</p> <p>2. The South and Eastern Regional OP run by the Southern Regional Assembly – All Research Centres awarded since 2013 i.e. CONNECT / ADAPT/ LERO AND ICRAE plus all Spokes awards made since 2014 from all 12 Research Centres are eligible also.</p> <p>European Territorial Cooperation (ETC) – also known as INTERREG – is part of the European cohesion and structural policy. The current round of INTERREG runs from 2017 to 2022. DBEI co-funds the research and innovation strand, together with our counterpart, the Department for the Economy in Northern Ireland. The R&I strand comprises two distinct elements: an initiative to increase the number of SMEs engaged in cross-border Research and Innovation activity (€18m) under which a range of activities will be provided for SMEs; and a more research-oriented initiative to increase the level of cross-border business and industry-relevant research and innovation capacity within the Health and Life Sciences and Renewable Energy sectors (€53m).</p> <p>A total of €71,330,880 has been committed to eight projects. Letters of offer have been issued to the seven projects under the Enhancing Research and Innovation Objective at a value of €54.7m. A letter of offer for €16.7m has also issued to the single project under the Business Investment in Research and Innovation objective, led by Intertrade Ireland. Its key objective is to increase the proportion of SMEs engaged in cross-border research and innovation (R&I) collaboration in the eligible region.</p> |
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| Action No. 6.6 | Ensure effective national coordination and oversight of participation by Ireland in Joint Programming Initiatives |
| <p>Description</p>  <p>European Research Area</p> | <p>National Steering Group for Joint Programming Initiatives will meet up to twice a year, with bilateral meetings as appropriate to ensure effective oversight.</p> |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | DBEI |
| Progress Update | <p>In light of the Horizon 2020 interim evaluation finding that the partnership landscape has become increasingly complex, the European Research Area and Innovation Committee (ERAC) established an ad hoc working group to advise on the future use of EU R&I partnership formats. To inform Ireland’s position on the future partnership landscape in Horizon Europe, DBEI will be consulting with relevant stakeholders during 2018, including JPI participants. DBEI continues to engage on JPI related issues at European level through its participation at the GPC (joint programming committee) meetings. Engagement at national level will be kept under review to reflect EU developments.</p> |

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| Action No. 6.7 APJ 2018 No. 52 | Enhance national participation in JPI and ERA-NET initiatives. |
| Description  | Develop further involvement in relevant JPI activities. |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | Relevant research funders (SFI, HRB, DAFM, Teagasc, MI, EPA, D/Arts and Heritage Council, GSI) |
| Progress Update | <p>DAFM allocates some funding from its three competitive research programmes to support national participation in strategically aligned JPI and ERA-Net competitive research Calls. Such participation helps leverage expertise and data and develop skills and networks. Current ERA-Nets supported include Sustainable Crop Production (SusCrop) and Sustainable Food Production and Consumption (SusFood 2). DAFM is also a member of governing board of the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) and Joint Programming Initiative for Healthy Diet Healthy Life (HDHL- JPI).</p> <p>The EPA collaborated with EU research programming through the Water Joint Programming Initiative (co-chaired by the EPA since 2014), Climate Joint Programming Initiative (chaired by the EPA since 2017), VERIFY Coordination Support Action (as a partner), BiodivERsA as an observer in the network in late 2016 and a full partner in 2018, EnvHealth (network of funders in Environment & Health), Share ‘5 Agencies’ Programme and CONCERT European Joint Programme (which the EPA joined in 2018).</p> <p>GSI are participating in 3 ERA Net projects:</p> <ul style="list-style-type: none"> • ERA MIN 2 (3 successful project starting in May 2018). Second call in planning stages • Geothermica (2 successful projects starting in June 2018). Second call in planning stages • GeoERA (GSI participating in 11 successful projects – In kind ERA NET) <p>The IRC is supporting four ERANets: HERA (Humanities in the European Research Area); NORFACE (New Opportunities for Research Funding Agency Cooperation in Europe); CHIST-ERA (European Coordinated Research on Long-term Challenges in Information and Communication Sciences & Technologies); and Gender-Net PLUS.</p> <p>Currently SFI is supporting six ERANets, two JPIs and is co-funding a H2020 Joint Technology Initiative project (commencement 2018).</p> <p>Teagasc is currently leading an ERA-NET Cofund on Greenhouse Gas Monitoring and Mitigation (FACCE ERA-GAS) on behalf of the Joint Programming Initiative 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</p> |

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| | member of Sustainable Animal Production (SusAn), Cofund on Sustainable Crop Production (SusCrop) and ICT-AGRI ERA-NETs. |
| Action No. 6.8 | 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. e. With UK Environment agencies in ShARE, support collaborative research for evidence to underpin environmental regulation. |
| Status | a. Ongoing b. Ongoing c. Ongoing d. Ongoing e. Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | a. SFI, HRB b. SFI c. SFI, DAFM d. DBEI, (MI) e. EPA |
| Progress Update | a. The HRB continues to participate in the SFI-HRB-Wellcome Trust Biomedical Research Partnership in which HRB and SFI jointly fund 50% of awards won by an Irish health researcher applying to Wellcome Trust programmes. Since 2016, there have been 14 awards made amounting to a total of €13m, including: <ul style="list-style-type: none"> • 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 Wellcome Trust Investigator Awards worth €3.82m (all partners) were approved for funding in Q2 of 2018. b. SFI has continued to support the Royal Society University Research Fellowship (RS-URF) with a total of three awards being funded in the 2017 RS-URF Scheme amounting to a total €1.5m. There are 2 SFI applicants currently under active review in the 2018 RS-URF Scheme. RS-URF award holders can apply for a RS-Research Grant in the first year of their award of up to €176,000. Two SFI URF award holders were awarded RS-Research Grants in 2018, amounting to a total of €300,000. There has been additional involvement in Royal Society through the recent RS-Enhancement Awards which enabled RS-URFs to apply for a further €114,000 in research funding. Eight SFI RS-URFs were awarded an Enhancement award totalling €0.8m in research costs providing further opportunities to support excellent, early-career researchers carry out research of national strategic importance in Ireland. c. DAFM continues to co-fund selected priority ERA-Nets that also involve UK collaborations – most recently this has included the SusCrop (Sustainable Crop Production) and SusFood 2 (Sustainable Food Production and Consumption) ERA-Nets, which include DEFRA as a co-funding partner. |

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| | <p>SFI report that more than 70 expressions of interest have been received under the EPSRC-SFI partnership to date. Applications are at various stages of review. In addition to the Standard Research Grants partnership, SFI and the EPSRC have launched a partnership under the EPSRC Centre for Doctoral Training (CDT) call which facilitates partnerships between the SFI Research Centres and Centres of excellence in the UK.</p> <p>The IRC held discussions on collaboration with three UK Research Councils (ESRC, AHRC and NERC) in early 2018. Post-creation of UKRI, joint planning will get underway again. The Council will be launching an International Engagement Strategy in June or July 2018, and collaboration with the UK research system will be a key focus within the strategy.</p> <p>d. The Department continues to be an active participant in the All Island Horizon 2020 Steering Group, which involves Intertrade Ireland, DBEI, Enterprise Ireland, Invest NI, and the Department for the Economy from the NI Executive, and engages to try and maximise north/south co-operation in regards to Horizon 2020 opportunities.</p> <p>e. 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. Such evidence and experience can be applied across the UK and Ireland, thus deriving maximum benefit for all from the funding and resources invested.</p> <p>In addition, 6 invitations to acts as evaluators, steering committee members for Environmental Protection Agency research projects have been taken up through the SHARE network. In December 2017 SHARE completed a Delphi exercise on air quality using the expertise of all 5 agencies to look for emerging issues in the area.</p> <p>The SHARE group met in Dublin in April 2018 to review its annual plan, 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 to the face-to-face meeting in Dublin, the SHARE project held six bi-monthly telephone meetings.</p> <p>UK applicants are also eligible under the EPA's Funding Rules. During the reporting period, the EPA provided funded to eight UK research Organisations: The James Hutton Institute; Scottish Environment Protection Agency (SEPA); Queen Mary University of London; Centre for Ecology & Hydrology; Kings College London; Queen's University Belfast; University of Hartford; University of Leicester.</p> |
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| Action No. 6.9 | Explore future joint funding opportunities with Northern Ireland |
|  European Research Area | Consider mechanisms under research infrastructure, research cooperation and researcher exchange |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | SFI/DAFM (DCCA, EPA, GIS) |
| Progress Update | <p>The Department of Agriculture, Environment and Rural Affairs (DAERA) in NI collaborated with DAFM on DAFM's 2017 Research Call which will result in the announcement in Q3 2018 in the announcement of in co-funding of a selection of the successful projects which have NI research participation. Details of the 2018 US-Ireland Research and Development Partnership Call in Agriculture was announced in June 2018 which will facilitate further tri-jurisdictional collaborations and co-funding opportunities by with Northern Ireland and the USA.</p> <p>There is a Centre-to-Centre proposal currently under review at the NSF with an expected outcome in mid-2018. This is part of 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.</p> <p>GSI report that they are in discussions with GSNI/BGS regarding research funding opportunities, however very limited funding is available currently.</p> <p>Please refer to Action 6.10 for further progress on joint funding opportunities with Northern Ireland.</p> |

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| Action No. 6.10 | Deepen collaboration through the US-Ireland R&D Partnership |
|  European Research Area | a. Expand remit of Partnership in areas of mutual interest to US, Ireland and NI. b. Support the NSF/GROW Programme for NSF Graduate Research Fellows to carry out research visits to Ireland. |
| Status | a. Ongoing b. Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | a. DBEI, ITI, (GSI Teagasc and EPA) b. SFI |
| Progress Update | a. For 2018 it was agreed to add four new Programme Priority Areas to the scope of the partnership alongside the existing three areas that were included in 2016 and 2017. This expansion will create co-operation between health and agriculture. The Partnership has funded 43 projects, representing a total investment of €66.96m. Over |

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| | <p>50 SFI team members were supported through the US-Ireland programme in 2017, including 20 PhD students and over 25 postdoctoral researchers.</p> <p>DAFM announced in June a new 2018 Call for Research Proposals in the US-Ireland Research and Development Partnership Call in Agriculture. The 2018 Call sees an expansion in the number of topic areas in scope from three to seven compared to the 2017 Call, with four new strategically relevant topics covering agri-food added following detailed discussions between officials across all three jurisdictions.</p> <p>b. In 2017, four applications to the NSF-GROW programme were successful. Under this programme, four National Science Foundation Graduate Research Fellows from the United States undertook a research visit to an SFI funded research group or Research Centre.</p> |
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| Action No. 6.11 | Develop follow up initiatives to the ISCA programme |
| Description  European Research Area | Develop funding partnerships with international funders in countries such as China, Brazil, India and Japan to support international collaborative research projects. |
| Status | Ongoing |
| Implementation Date | 2016 – 2020 |
| Lead Responsibility | SFI |
| Progress Update | <p>The inaugural Science Foundation Ireland – National Natural Science Foundation of China Partnership Programme Call 2017 (SFI-NSFC 2017) was launched in March 2017. The major goal of the call was to support excellent and innovative collaborative research projects in priority areas of relevance to Ireland and China in order to build capacity, expertise and mutually beneficial relationships between researchers in both countries. This call saw a high number of applications with 46 proposals submitted for review, ensuring that the selection process was very competitive. Eight research projects in the areas of wireless and optical communications, artificial intelligence, micro- and nano-electronics, climate change, green energy, and nano-materials for biomedical applications were funded at a total level of ca. €12.7 million, consisting of SFI investment (€8.6 million) and NSFC investment (¥31.9 million - approx. €4.1 million).</p> |

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| Action No. 6.12 | Initiate negotiations with CERN for Ireland's membership options |
|  European Research Area | Enter discussions with CERN. |
| Status | Completed 2016 |
| Implementation Date | 2016 |
| Lead Responsibility | DBEI |
| Progress Update | While discussions were entered into, due to intense demands on the capital programme and tight fiscal constraints, it has not been possible to date to progress membership of CERN. The issue of membership remains under review with a view to progressing when the fiscal situation permits. |

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| Action No. 6.13 | Initiate negotiations with ESO for Ireland's membership options |
|  European Research Area | Enter discussions with ESO. |
| Status | Completed 2018 |
| Implementation Date | 2018 |
| Lead Responsibility | DBEI |
| Progress Update | Final negotiations took place in Q1 2018, and terms for Ireland's membership were successfully agreed. Ireland has formally applied for membership, and it is expected that Ireland will take its place on the governing Council of the ESO in Q4 2018. |

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| 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 | Completed 2017 |
| Implementation Date | 2016 |
| Lead Responsibility | DBEI |
| Progress Update | Refer to Second Progress Report |

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| Action No. 6.15 | Formally review membership of IROs at least every five years |
| Description | Undertake review of the costs and benefits of existing and potential IRO memberships on basis of scientific and industry benefits relative to full cost of memberships. |
| Status | Not yet initiated |
| Implementation Date | 2020 |
| Lead Responsibility | DBEI |
| Progress Update | |

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| Action No. 6.16 | Retain membership of international research funding organisations; benchmark Ireland and adopt best known practices. |
| Description | Benchmark Ireland against large, small and EU countries. Learn from and adopt best known practice, policies and initiatives. |
| Status | Not yet initiated |
| Implementation Date | 2016-2020 |
| Lead Responsibility | Relevant research funders |
| Progress Update | SFI, the IRC and HRB are all members of Science Europe, which provides a forum for exchange of information on good practice and policies. |

Innovation Implementation

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| Action No. 7.1 | Establish the Innovation 2020 Implementation Group | | |
| Description | To ensure a coherent approach to implementation of this strategy the IDC, the RPAG and the H2020 HLG will be merged to create one coherent group to drive implementation of this strategy – the Innovation 2020 Implementation Group. | | |
| Status | Completed 2016 | | |
| Implementation Date | 2016 | | |
| Lead Responsibility | DBEI | | |
| Progress Update | Refer to First Progress Report | | |
| Action No. 7.2 | Maximise synergies between the Innovation 2020 Implementation Group and other relevant groups in the science and innovation area | | |
| Description | Put in place informal reporting mechanisms between the Innovation 2020 Implementation Group and other relevant groups to ensure coherence in development and delivery of policy across all relevant Government departments. | | |
| Status | Ongoing | | |
| Implementation Date | 2016 – 2020 | | |
| Lead Responsibility | All relevant Government departments | | |
| Progress Update | <p>The Innovation 2020 Implementation Group affords the opportunity for relevant groups to report, present and collaborate on a variety of initiatives. Group members have engaged with the Research Integrity Forum, the National Open Research Forum, Health Innovation Hub Ireland, the Horizon 2020 High Level Group. Group members have presented on IRC initiatives, the SEAI Strategy 2017-2021, the National Marine Research and Innovation Strategy and the Energy Research Strategy.</p> <p>Additionally, members of the group in addition to representatives of enterprise, the public sector and academia participated in the consultation event for the refresh of research prioritisation areas in November 2017 (please refer to Action 2.3).</p> | | |
| Action No. 7.3 | Implement, monitor and build on the Irish National Policy on Ensuring Integrity in Research | | |
| Description |  <p>a. Develop and implement nationally harmonised best practice guidelines, training curricula, grant conditions, and processes for handling research misconduct.</p> <p>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.</p> <p>c. Consider expanding and extending SFI pilot audits to all funders i.e. national shared audit scheme.</p> | | |
| Status | a. Ongoing | b. Completed 2018 | c. Nearly complete |
| Implementation Date | 2016 – 2020 | | |
| Lead Responsibility | Research Integrity Forum, research funders and performers | | |

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| <p>Progress Update</p> | <p>a. The Forum has put in place a pilot online research integrity training programme, supported financially by the research funders and the research performers (via their representative bodies the Irish Universities Association (IUA) and the Technological Higher Education Association (THEA)). The pilot commenced in January 2018 and will provide training for 15,000 researchers over a three-year period. While roll out of this programme across 26 independent research-performing organisations is inevitably complex, some minor issues which arose early in the roll-out are actively being resolved to enable broad engagement across the research system.</p> <p>The Forum has committed to publishing an update of the National Policy Statement on Ensuring Research Integrity in Ireland by the end of 2018, to keep it in line with the European Code of Conduct for Research Integrity, the second edition of which was published in April 2017. A sub-group of the Forum has been tasked with the revisions. 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.</p> <p>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 is continuing to work with other stakeholders, including the National Open Research Forum, on the important issue of storage of research data.</p> <p>b. 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 Forum secretariat (IUA and THEA) 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 took place in Q3 and 4 2017, and the first draft report was presented to the Forum in January 2018. Following revisions and approval by the Forum in May 2018, it will be published in June 2018. The exercise will be repeated in Q3 and Q4 2018.</p> <p>c. The Forum has convened a working group to liaise on the development of an Agreed Upon Procedure (AUP) for proposed SFI reviews of research-performing organisations. Plans for exploratory visits to two HEIs in Q2 2018 are well advanced with a view to informing the AUP. Emanating from this working group, broader discussions on the most effective mechanisms for assurance of research related matters are underway, led by HEA.</p> <p>Additional progress:</p> <ul style="list-style-type: none"> • The Chair and Deputy Chair of the Forum (Professor Anita Maguire UCC and Dr Jennifer Brennan, THEA) will represent Ireland in a European Commission Mutual Learning Exercise on Research Integrity, beginning June 2018. |
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| | <ul style="list-style-type: none"> The work of the Forum has been presented at three international conferences: SATORI Workshop, Nov 2016; 5th World Conference on Research Integrity, May 2017; PRINTEGER Conference, April 2018. Following on from the inaugural seminar of the National Forum on Research Integrity in February 2017, the Forum plans an event during the coming year with the National Open Research Forum, on the interface between Research Integrity and Open Research. The report from the inaugural seminar is available here. Several of the Forum members have joined the UK Research Integrity Office, a non-profit which provides valuable training and advice on research integrity to organisations. <p>The Forum held a very successful peer-engagement seminar for Research Integrity Officers (RIOs) 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. The Forum recognizes the importance of creating opportunities for peer engagement among the RIOs and will ensure this is an ongoing priority.</p> |
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| Action No. 7.4 | Report to Cabinet Committee on progress implementing the strategy |
|  <p>European Research Area</p> | 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 |
| Progress Update | The second Innovation 2020 Progress Report was brought to Cabinet Committee on 13 th September 2017 and published on 7 th December 2017. This third report was brought to the Innovation 2020 Implementation Group in June 2018, and then to Cabinet in July 2018 and published thereafter. |

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| Action No. 7.5 | Evaluation of this strategy | | |
| Description | <p>a. A mid-term evaluation of this strategy will be carried out so that relevant adjustments can be made in a timely manner to ensure successful delivery on the vision and objectives.</p> <p>b. A retrospective evaluation of this strategy will be carried out to inform the development of its successor.</p> | | |
| Status | <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">a. Initiated</td> <td style="width: 50%;">b. Not yet initiated</td> </tr> </table> | a. Initiated | b. Not yet initiated |
| a. Initiated | b. Not yet initiated | | |
| Implementation Date | 2018 | | |
| Lead Responsibility | a. Innovation 2020 Implementation Group | | |
| Progress Update | a. Strategic Policy Division (DBEI) will undertake a review of the strategy in Q3 2018. The Terms of Reference have been developed and presented to the Innovation 2020 Implementation Group on June 8 th , 2018. | | |

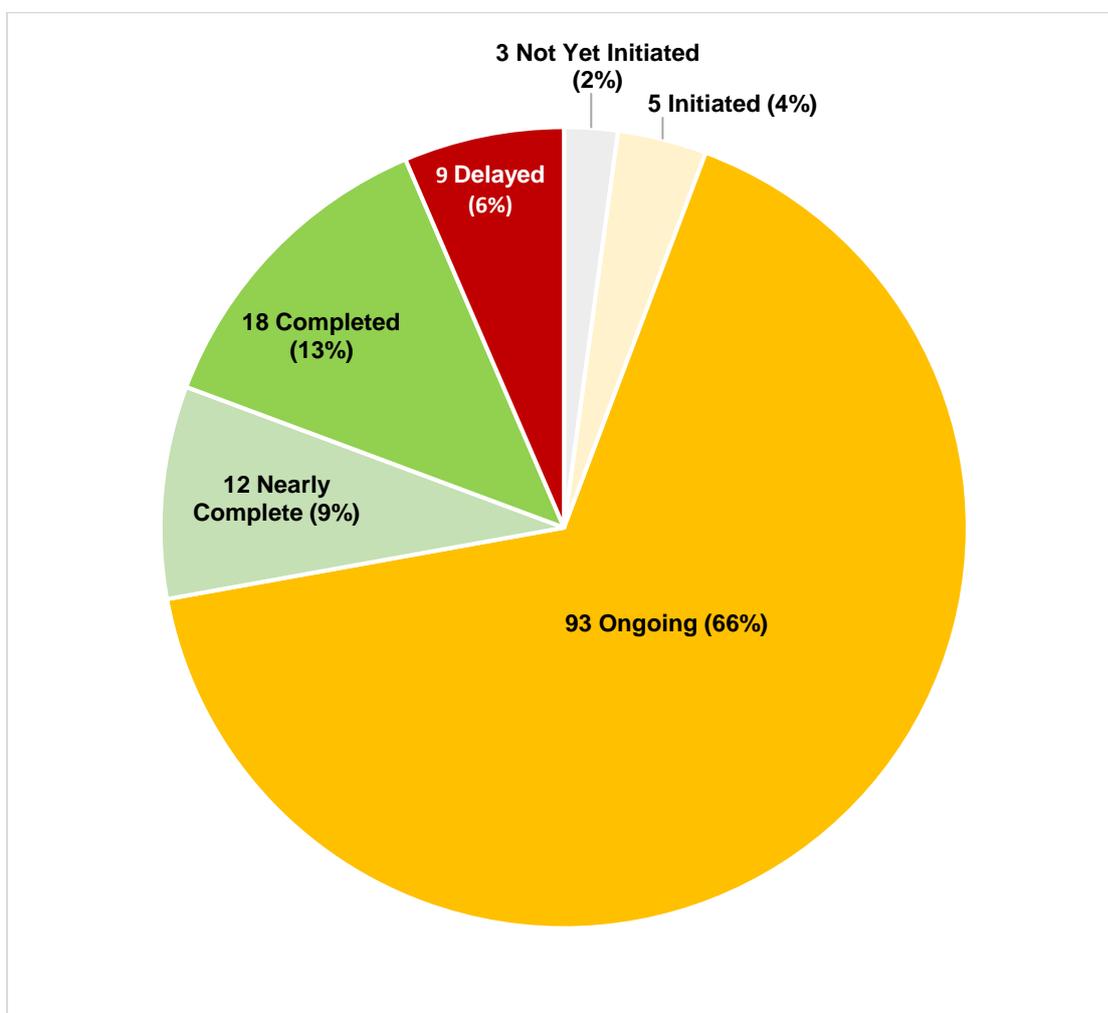
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| Action No. 7.6 | Standardised classification of public investment in research | | |
| Description | <ul style="list-style-type: none"> a. Drive the development of a standardised categorisation scheme for tracking public investment in R&D based on 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 | a. Delayed | b. Delayed | c. Delayed |
| Implementation Date | 2017 | | |
| Lead Responsibility | <ul style="list-style-type: none"> a. Innovation 2020 Implementation Group b. All research funders c. All research funders | | |
| Progress Update | <p>In Q3 2017, DBEI met with HEA to discuss a draft proposal to consider options in line with current policy development on Classification of Investment in Research. Completion of a standardised categorisation scheme depends on future resource allocation.</p> <p>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 project to map national health research investment against the Health Research Classification System (HRCS) over a five year period from 2011-2015. Data analysis was completed in 2017 and it is planned to publish the aggregated results in 2018.</p> | | |

Annex 1 – Breakdown of Progress on Actions

Innovation 2020 comprises 140 actions (which includes headline actions and their sub-actions).

Since the second progress report, 5 actions are newly initiated and 5 additional actions have been completed, bringing the total complete actions to 18. 8 additional actions are now delayed, bringing the total to 9 delayed actions.

A summary of progress is illustrated in the chart below.





Annex 2 – Glossary

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| BERD | Business Expenditure on Research and Development |
| DAFM | Department of Agriculture, Food & Marine |
| DBEI | Department of Business, Enterprise and Innovation |
| DCCA | Department of Communications, Climate Action and Environment |
| DCCOI | Design & Crafts Council of Ireland |
| DES | Department of Education & Skills |
| DoF | Department of Finance |
| DoH | Department of Health |
| EI | Enterprise Ireland |
| EPA | Environmental Protection Agency |
| ERA | European Research Area |
| ERC | European Research Council |
| ERDF | European Regional Development Fund |
| ESFI | European Fund for Strategic Investments |
| ETC | European Territorial Cooperation |
| GBARD | Government Budget Allocations for Research and Development |
| GERD | Gross Expenditure on Research and Development |
| GovERD | Government Expenditure on Research and Development |
| GSI | Geological Survey Ireland |
| HEA | Higher Education Authority |
| HEI | Higher Education Institute |
| HERD | Higher Education Expenditure on Research and Development |
| HRB | Health Research Board |
| IDA Ireland | Industrial Development Agency Ireland |
| IDR | Interdisciplinary Research |
| IRC | Irish Research Council |
| IUA | Irish Universities Association |
| KTI | Knowledge Transfer Ireland |
| MI | Marine Institute |
| NSAI | National Standards Authority of Ireland |
| PRTL | Programme for Research in Third Level Institutions |
| RDI | Research, Development and Innovation |
| RPO | Research Performing Organisation |
| RTO | Research Technology Organisation |
| SBIR | Small Business Innovation Research |
| SEAI | Sustainable Energy Authority of Ireland |
| SFI | Science Foundation Ireland |



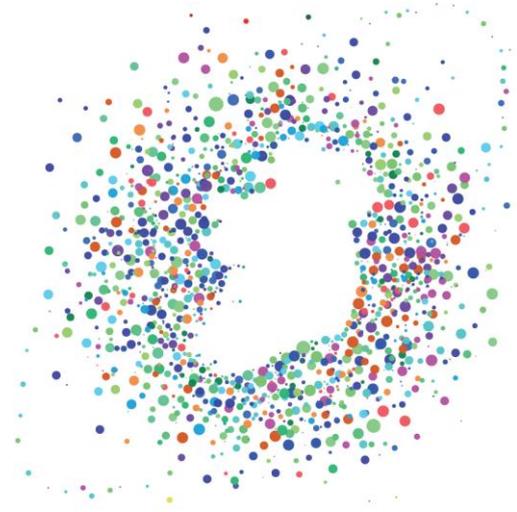
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