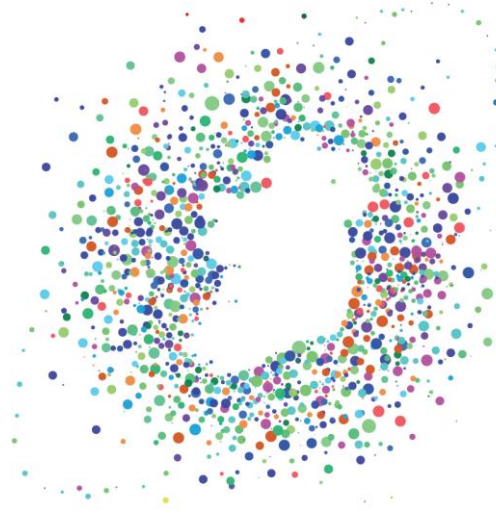




Rialtas na hÉireann
Government of Ireland



**Consultation Paper for the
Mid-term Review of Innovation 2020**

**Call for Submissions
Deadline October 11, 2018**

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1. Introduction

Innovation 2020 (I2020) is Ireland's strategy for research and development, science and technology for the period 2016-2020. It sets the vision for Ireland to become a Global Innovation Leader driving a strong sustainable economy and better society underpinned by:

- Excellent research in strategically important areas that has relevance and impact for the economy and society;
- A strong innovative and internationally competitive enterprise base, growing employment, sales and exports;
- A renowned pool of talent both in Ireland's public research system and in industry that maximises exchange of talent and knowledge;
- A coherent joined-up innovation ecosystem, responsive to emerging opportunities, delivering enhanced impact through the creation and application of knowledge;
- An internationally competitive research system that acts as a magnet and catalyst for talent and industry;

To deliver this vision, the following objectives are pursued:

- Increase public and private investment in research and development;
- Enhance the impact of research and innovation for enterprise;
- Ensure that education drives innovation;
- Focus research and innovation activity on social and economic development;
- Support innovation through the protection and transfer of knowledge;
- Engage with the rest of the world in becoming a Global Innovation Leader;
- Effectively implement this strategy to become a Global Innovation Leader.

The strategy includes 140 actions (including headline actions and sub-actions). When the Third Progress Report was published in July 2018, 18 actions were complete, 12 were nearly complete, 9 actions were encountering delays, 5 actions were just initiated and three were not yet initiated. The 93 remaining actions are ongoing.

Action 7.5 of I2020 provides that the Implementation Group will lead a mid-term evaluation of this strategy so that "relevant adjustments can be made in a timely manner to ensure successful delivery on the vision and objectives". The review is being undertaken by the Department of Business Enterprise and Innovation on behalf of the I2020 Implementation Group.

The purpose of this Call for Submissions is to seek input from interested parties for the Mid-term Review of Innovation 2020. Respondents are asked to provide input in relation to the four areas below:

1. The implementation of I2020 to date.
2. How changes in the broader policy environment (e.g. economic, social, enterprise and education policy) as well as the changes in European Research, Development and Innovation (RDI) policy will impact on the implementation of I2020.
3. The key areas of focus for the remainder of the Strategy (until the end of 2020) to ensure successful delivery of the Strategy.
4. Other issues that pertain to I2020.

To assist respondents, this document provides a summary of progress under each of the goals of the Strategy at Section 3.

You are invited to submit your written views under the above headings **by October 11, 2018** at the following address:

Department of Business Enterprise and Innovation
e-mail: john.morris@dbei.gov.ie

For any queries, please contact, Dr Anne Ribault-O'Reilly (Phone 01.631.22.31 or anne.ribaultoreilly@dbei.gov.ie)

2. Objective for the Mid-term Review

The Terms of Reference of the Mid-term Review (see Appendix 1) stipulate that the review will:

- Assess progress in achieving the targets set out in I2020;
- Assess progress in the implementation of the Strategy based on the I2020 Progress Reports for 2016, 2017 and 2018;
- Identify any changes in the national and international policy environment that impact on the objectives of I2020 and the delivery of the actions;
- Review the actions as necessary to ensure that they continue to be aligned with the overall vision and objectives of the Strategy.

The objective of the Mid-term review is to ensure that the Strategy continues to deliver the vision and objectives for Ireland's RDI system whilst acknowledging the changes in the policy environment, responding to emerging opportunities and delivering enhanced impact. The Terms of Reference do not provide for any extensive evaluation of the outcome and the impact of I2020; these are issues appropriate to a later *ex post* evaluation which will be undertaken in 2020 (Action 7.5 of I2020).

The terms of Reference for the Mid-term Review provide for an online public consultation based on this Call for Submissions.

3. Overview of Progress to date

This section provides an overview of the implementation of the 140 actions (across the 7 goals/chapters of I2020) at midway point through the Strategy. Detailed information on the status of each action is available from the I2020 progress reports¹.

Goal 1: Ireland as a Global Innovation Leader

The five actions under Goal 1 set the strategy’s vision and the objective of reaching the target of 2.5% of GNP research intensity, Ireland’s commitment under the Europe 2020 Strategy (2011). Progress on these actions is ongoing as outlined in table 1 below:

Completed	0	Delayed	0
Nearly completed	0	Initiated	0
Progressing / on-going	5	Not yet scheduled to be initiated	0

Ireland’s position in terms of innovation leadership is progressing. Ireland has gained one place on the 2016 European Innovation Scoreboard² with a 9th position in the 2018 European Innovation Scoreboard³ (Action 1.1). Ireland is a “Strong Innovator” positioned behind Germany, Belgium and the “Innovation Leaders” but ahead of Austria, France and Slovenia (the “Innovation Leaders” are Sweden, Denmark, Finland, the Netherlands, the UK and Luxembourg). Noticeably, Ireland is the best performer for three of the 10 dimensions of the Scoreboard: innovation in SMEs, level of employment in knowledge-intensive activities and sales impacts.

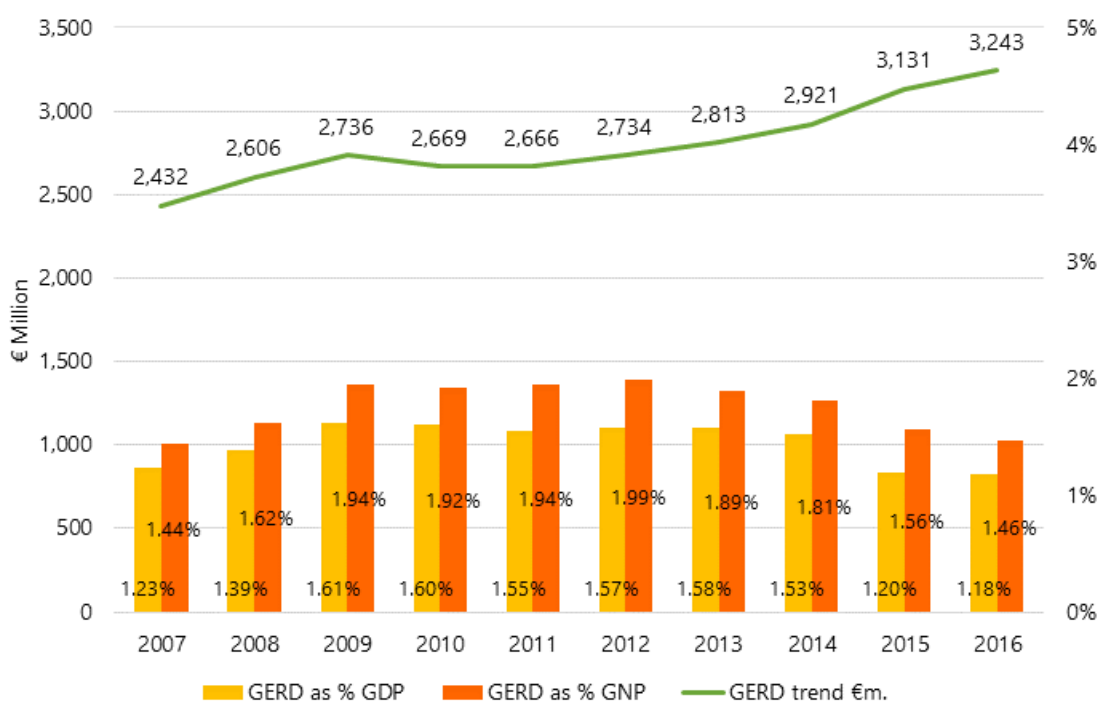
Gross Domestic Expenditure in Research and Development (GERD includes expenditure in R&D by Business Enterprises, Higher Education Institutions as well as Government and Not for Profit Organisations) increased to €3.2bn in 2016 (+ 3.5% on 2015). In 2016, GERD stood at 1.46% of GNP (further details on GERD and the research intensity rate are available in figure 1).

¹ The progress reports are available from the following link: <https://dbei.gov.ie/en/Publications/Innovation-2020-Progress-Reports.html>

² The European Innovation Scoreboard provides a comparative assessment of the performance of 28 EU Member States across 10 dimensions. The 2016 European Innovation Scoreboard uses 2014 data.

³ The 2018 European Innovation Scoreboard uses 2016 data.

Figure 1: Gross Expenditure on R&D and as a % of GDP/GNP 2007-2016



Source: DBEI based on CSO data⁴

Reaching the 2.5% of GNP research intensity target within the timeframe of 2020 (Action 1.2.a) presents a significant challenge:

- Despite the increase in GERD since 2012 when it reached a high of 1.99% of GNP, the research intensity rate has fallen as GNP increased at a faster rate, reflecting the strong economic recovery over recent years.
- Post economic crisis, public investment in RDI - a key component of GERD - is recovering slowly: Government Budget Allocation for Research and Development (GBARD) was €768.4m in 2017 (based on Budget 2017 estimates) having decreased to €721.7m in 2013 from a peak of €930m in 2008.

⁴ the data presented is based on <https://dbei.gov.ie/en/Publications/Publication-files/R-D-Budget-Survey-Report-2016-2017.pdf> and September 2018 GDP and GNP data.

Other actions are progressing:

- The target for growth in the number of large and significant R&D performers (Action 1.2.b) will be achieved⁵ but, despite the broad range of enterprise supports (grant and tax incentives), only 57% of Irish enterprises with more than 10 employees consider themselves innovation active between 2014-2016⁶ (the I2020 target is 73%).
- The I2020 target of doubling of private funding of RDI in the higher education sector target is likely to be achieved (Action 1.2.c) with private funding increasing from €31.2m to €48m.
- From February 2014 to August 2018, Irish researchers secured €577 million in competitive funding under Horizon 2020 (H2020) – the European Framework Programme for Research and Innovation (Action 1.2.d), which is equivalent to 1.73% of the H2020 budget committed to date, ahead of the 1.56% objective corresponding to the I2020 target of €1.25bn of Horizon 2020 funding.

⁵ In 2015, 1,184 enterprises are significant R&D performers with more that €100,000 spent on RDI – the Innovation 2020 target is 1,200 by 2020 and 184 enterprises are large R&D performers – the target is 200 by 2020.

⁶ This information is based on the CSO (2018) Innovation in Irish Enterprise Survey:
<https://www.cso.ie/en/releasesandpublications/er/ie/innovationinirishenterprises2016/>.

Goal 2: Innovation in Enterprise

One of the key objectives of I2020 is to drive innovation in enterprise with new or improved products, processes or services to ultimately grow and diversify Ireland’s enterprise base and improve its productivity and competitiveness. The objective is pursued with 26 actions to:

- Align innovation investment with enterprise opportunities;
- Tailor supports to meet enterprise needs;
- Develop an ecosystem of research and technology centres;
- Develop Ireland as a test-bed location;
- Promote inter-disciplinary research;
- Promote innovation-driven entrepreneurship*⁷;
- Enhance access to finance for innovation*;
- Develop collaboration within the public research system and between it and enterprise;
- Promote design-driven innovation*;
- Promote standards and regulation as source of competitive advantage*.

An overview of the actions is presented below.

Table 2 - Status of the 26 Actions under Goal 2: Innovation in Enterprise			
Completed (Actions 2.3, and 2.6.e)	2	Delayed	0
Nearly completed (Actions 2.4.a and 2.5)	2	Initiated (Actions 2.13 and 2.14)	2
Progressing / on-going	20	Not yet scheduled to be initiated	0

Align innovation investment with enterprise opportunities

I2020 seeks the alignment of investment with enterprise opportunities with 4 actions. One action is completed and three actions are ongoing:

- The new cycle of research prioritisation (Action 2.2) was put in place in Q1, 2018. It targets competitive public investment to priority areas that are favourably positioned to benefit from global opportunities and support enterprise policy.
- The targeting of competitively awarded research investment in support of enterprise towards the revised priority areas (Action 2.1.a, 2.1.b and 2.3) by funders is on-going.

⁷ The actions with “*” are grouped under the heading “Framework Conditions”.

- Funders are carrying out a number of initiatives to stimulate public research on Services and Business Processes and Manufacturing Competitiveness (Action 2.2.a and Action 2.2.b). Further investment is required through the HEA's foundation investment in research capacity.

Tailor supports to meet enterprise needs.

The four actions tailoring RDI supports to enterprise needs are progressing:

- Two actions are nearly completed: the review of RDI support conducted by DBEI (Action 2.4.a) and the directory of innovation supports compiled by DBEI and hosted on KTI website (Action 2.5).
- Two actions are progressing: the review and streamlining of enterprise RDI supports (Action 2.4.b) to increase private investment (Action 2.4.c) with the introduction of EI's Agile Innovation fund, the Business Innovation Initiative, the €500m Disruptive Technology Innovation fund⁸ and the Enterprise Innovation Vouchers.

Develop an ecosystem of research and technology centres

The ecosystem of research and technology centres is progressing with 5 ongoing actions:

- The optimisation and enhancement of the Network of Technology Centres with the review of three Technology Centres (Action 2.6.a) and the increase in funding for two Technology Centres;
- The allocation of EI funding for 15 Technology Gateways for the period 2018-2022 with two new clusters (Applied Internet of Things and Engineering, Materials and Design Cluster) and the federation of 7 existing Technologies Gateways into a Food Tech Cluster (Action 2.6.b);
- The launch of four new SFI Research Centres and the announcement of a 5th new centre (Action 2.6.c) with a commitment of €100m SFI investment complemented by €54m of enterprise investment;
- The opening of the first Research Technology Organisation (the Irish Manufacturing Research Centre funded by EI and the IDA) and the announcement of a second (the Fraunhofer Project Centre to be established in Ireland with funding from SFI and Fraunhofer-Gesellschaft) (Action 2.6.d);
- The completion of the standardisation of performance indicators for Technology Gateways, Technology Centres and Research Centres (Action 2.6.e).

⁸ The fund is one of four funds in the National Development Plan 2018-2027. The fund, administered by EI, will drive collaboration between Ireland's world-class research base and industry as well as facilitating enterprises to compete directly for funding in support of the development and adoption of these technologies.

Promote Ireland as a test-bed location

The promotion of Ireland as a test-bed location is progressing with two ongoing actions:

- The funding of facilities for innovative technologies and therapies (Action 2.7.a) by HRB, SFI and MI;
- The development of transparent protocols to facilitate and encourage enterprise access to the test-beds (Action 2.7.b) by SFI.

Promote inter-disciplinary collaborations

Inter-disciplinary collaborations (Action 2.8) are enabled by the HEA core-grant and stimulated by an increase in co-funded programmes.

Develop collaborations

The five actions encouraging collaborations within the public research system and between it and enterprise are progressing with:

- The research funders reviewing their programmes to incentivise collaborations within the public research system (Action 2.11.a) and to identify complementarities (Action 2.11.b);
- The establishment of new enterprise liaison positions for KTI (Action 2.12.a), the expansion of SFI Strategic Partnership and Spokes Programmes (Action 2.12.c), and the promotion of the Innovation Partnerships (Action 2.12.c) with, for instance, the Technologies Gateways funded by EI.

Enhance framework conditions

Four actions seek to enhance the framework conditions for Innovation. They are all progressing:

- The action promoting innovation-driven entrepreneurship (Action 2.9) is progressing with the initiation of a OECD “Review of SME and Entrepreneurship Issues and Policies in Ireland” in Q2, 2018;
- The action developing access to finance (Action 2.10) is progressing with new Finance for Growth Initiatives such as the Credit Guarantee Scheme 2017 and the Brexit Loan Scheme;
- The action promoting design-driven innovation (Action 2.13) was initiated with the establishment in May 2017 of the National Design Forum – a key action of the Design Strategy;
- The action promoting standards and regulations as a source of competitive advantage (Action 2.14) has been initiated by NSAI.

Goal 3: Education for Innovation

I2020 contains 24 actions focusing on the needs of the Irish RDI system in terms of research talent and research infrastructure. These actions seek to:

- Ensure that the higher education sector drives innovation;
- Continue to develop the pipeline of talent;
- Increase the pipeline of PhDs, post-doctoral researchers and principal investigators;
- Promote “Frontier Research” across all disciplines;
- Create opportunities for world-renowned research professors;
- Develop a clear career structure for researchers involved in innovation;
- Create opportunities for improved research mobility;
- Promote gender equality in research careers;
- Further develop our research infrastructure.

Further details on the progress to date are presented below.

Completed (Actions 3.8 and 3.13)	2	Delayed (Actions 3.7.b. and 3.14)	2
Nearly completed (Action 3.10)	1	Initiated	0
Progressing/ On-going	19	Not yet scheduled to be initiated	0

Continue to develop the pipeline of research talent.

I2020 seeks to increase interest in RDI careers and develop awareness of RDI activities with four actions. They are all in progress with:

- The publication by the Department of Education and Skills of the “STEM Education Policy Statement and Implementation Plan” (Action 3.1.);
- A range of initiatives from SFI, the HEA, the EPA and the IRC to encourage young people and the wider population to participate in STEM disciplines (Action 3.2.a) and to engage the broader Irish Public in STEM (Action 3.2.b). To date, the impact on the profile of students choosing STEM subjects at third level has been minimal (Action 3.2.c);
- An increase in the number of new apprenticeship and traineeship programmes since 2015 to respond to employers’ needs in terms of STEM/RDI related know-how (Action 3.3).

Ensure that the higher education sector drives innovation

To drive innovation, I2020 seeks to develop a world-class standard for postgraduate education and training (Action 3.4). The National Advisory Forum for Ireland’s Framework

for Doctoral Education, co-chaired by the HEA and QQI, is supporting the implementation of this National Framework.

Increase the pipeline of PhDs, post-doctoral researchers and principal investigators

Five actions seek to increase the number of researchers across the pipeline with limited progress on the first four actions and a delay on the action aiming to facilitate the recruitment of applicants with industry linkages:

- Progress on the recruitment of 500 new PhD (Action 3.5) is slow. After a reduction in number (with 34 less enrolments) between 2016/17, a number of initiatives have been introduced in 2018: the IRC funded new post-graduate scholarships, the HRB launched new collaborative doctoral awards and SFI launched a new €100m 5-years PhD students funding programme with the new SFI Centres for Research Training (CRT);
- New initiatives have increased the number of career opportunities for Young Researchers (Action 3.6) as well as Early- and Mid-career independent Researchers (Action 3.7.a). Reaching the 30% target is contingent on additional budget for the IRC, HRB, SFI;
- The development of metrics to score applicants for academic positions with industry linkages is expected to be delivered in 2018 (Action 3.7. b).

Promote “Frontier Research” across all disciplines

The establishment of a new IRC “Laureate Awards” programme was completed with the first call for “Laureate Awards” in 2017 (Action 3.8). Funding has been committed for a second call of the “Laureate Awards” for the Advanced Career stage.

Create opportunities for world-renowned research professors

Two actions aim at creating opportunities to recruit world-renowned professors:

- The recruitment of new research talent (Action 3.9.a) has been initiated by SFI but meeting the targets (10 Future Leaders and 3 to 5 Research Professorships per annum) will require significant funding;
- The provision of support by the Embassy Network of research, innovation and education opportunities for researchers in Ireland (Action 3.9.b) is on-going.

Develop a clear career structure for researchers involved in innovation.

The two actions seeking to develop a clear career structure for researchers are progressing:

- The national policy on structured progression for researchers (Action 3.10) is almost complete;
- Improvements in the provision of career advice, including in terms of non-academic career path and support (Action 3.11) continue to be made by HEIs and research funders.

Create opportunities for improved researcher mobility

Six actions aim to improve researcher mobility. The four actions relating to mobility between academia and industry are progressing with:

- An increase in the number of researchers with supported appointment in industry (Action 3.12.a) with SFI Industry Fellowships (from 21 in 2015 to 41 in 2017) and new IRC Employment based Postgraduate and Enterprise Partnership Programmes (76 awards in total in 2017);
- An increase in the flow of researchers from SFI Centres to industry (Action 3.12.b) from 24% in 2015 to 29% in 2017 (the I2020 target is 35% by 2020);
- An improvement of researcher mobility tracking (Action 3.12.c) with a range of initiatives by the HEA and other funders;
- The ongoing support by DBEI of the EURAXESS Ireland Office to facilitate the international recruitment of researchers (Action 3.12.d).

The action relating to the development of innovation and entrepreneurship skills (Action 3.13) is completed with initiatives from SFI, DAFM and EI⁹.

The action relating to access to the EU RESAVER Pension Scheme (Action 3.14) is delayed: an exemption from membership of the State Single Pension Scheme is required to introduce the scheme.

Promote gender equality in research careers

The action seeking to promote gender equality within research career (Action 3.15) is progressing with a number of institutions (HEIs and Research Funders) taking a range of initiatives to address gender bias in recruitment and award selection. This will be further accelerated with the publication of a Gender Equality Task Force Action Plan 2018-2020¹⁰.

Further develop our research infrastructure

I2020 provides for the strategic development of research infrastructure (Action 3.16.a) and access policies that maximise enterprise use of the infrastructures (Action 3.16.b). Both are progressing but significant development of research infrastructure is constrained by limited available funding:

- To address some of the current infrastructure needs within third level institutions, SFI has funded €60m of research infrastructures since the start of 2016.
- Project 2040 - Ireland's National Development Plan - commits to €2.2bn in support of infrastructure in the higher education sector, including a new Programme for Research in Third Level Institutions (PRTLII). A Government decision on the timing and scale of the next cycle of PRTLII is pending.
- Planned investment (€200m investment in the Institute of Technology sector through Public Private Partnership and €278m investment in the higher education sector) will impact positively on RDI infrastructure capacity.

⁹ The EI initiative is a TechStart / GraD Start Programme. It is not reported in the third Progress Report but in the Action Plan for Jobs 2018 progress reports.

¹⁰ The Task Force was appointed by the Minister of State with responsibility for Higher Education, Marie-Mitchell O'Connor TD, in November 2017..

Goal 4: Innovation for Social Progress and the Economy

I2020 contains 39 actions to promote innovation for social progress and economic impact. They seek to create a coordinated innovation and public research system and

- Promote innovation in the public sector;
- Facilitate access to scientific publications/research;
- Promote innovation in health, agri-food, marine, environment, the digital society, energy, natural resources, and defence.

The status of these actions is provided in the table below. The progress to date is then summarised.

Completed (Actions 4.10 a. 4.11, 4.16 and 4.17. a)	4	Delayed (Action 4.26)	1
Nearly completed (Actions 4.14.a, 4.14.b, 4.15.a, 4.22, 4.25.a and 4.25.b.)	6	Initiated (Actions 4.6 and 4.13.b)	2
Progressing / on-going	26	Not yet Initiated	0

To increase innovation in the Public Sector

One of the objectives of I2020 is to increase innovation in the public sector. The seven actions are progressing as outlined below:

- The use of scientific evidence by policy makers (Action 4.1.a) is increasing with, for instance, the new “Evidence Generation and Knowledge Dissemination” Unit in the HRB and HRB funding of a new initiative to build capacity in evidence synthesis;
- The number of evaluations of funding programmes (Action 4.1.b), including research programmes, is increasing;
- There is regular engagement by Government Departments with the annual Estimates process and Cabinet (Action 4.2);
- A number of competitive funds for global and societal challenges (Action 4.3) have been launched (the IRC COALESCE Programme - Collaborative Alliances for Societal Challenges and the Disruptive Technologies Innovation Fund managed by EI) and European Joint Programming Initiatives are co-funded;
- There are a number of targeted supports to cultivate interdisciplinary research (the IRC COALESCE Call) and increase engagement of public entities with civic society (Action 4.4) with, for instance, the funding of Patient and Public Involvement by the HRB co-funded with the IRC;

- The increase in supports for collaborations across sectors (the public and private) with intensified collaborations between research funders and not-for-profit entities and with EI's Small Business Innovation Research (SBIR) initiatives (Action 4.5);
- The development of public service innovation to deliver better outcomes for users of public services (Action 4.6) with "Our Public Service 2020" – the Government public service innovation and development framework.

Support Open Access

The implementation of the Open Access agenda is building momentum (Action 4.7):

- The National Open Research Forum co-chaired by the HEA and HRB (as a successor to National Steering Committee on Open Access Policy) is developing a National Policy Statement on the transition to Open Research (publications and data principles);
- The HEA is leading a review of the services provided by the national research e-library (IReL) and coordinating a review of bibliometric analytical tools nationally¹¹;
- Other initiatives such as requirements by Research Funders, the HRB Open Science Publishing Platform and data stewards training are on-going.

Sector Specific Actions

To promote innovation in **health**, the actions involve developing a coordinated approach to research management (Action 4.8), support for exceptional researchers, talent and leadership in health research (Action 4.9 with 5 sub-actions) and support for collaboration between the health system and enterprise to develop and commercialise new healthcare technologies and enhance efficiencies (Action 4.10 with 2 sub-actions). The most significant developments are:

- The Department of Health has established a new Research and Development and Health Analytics Division within the Department;
- The funding and development of new health research infrastructure (the Health Innovation Hub, the Clinical Research Facilities and Clinical Research Co-ordination Ireland (HRB-CRCI), the national bio-banking system);
- The publication of the HRB Strategy 2016-2020 and the development and roll out of a Research Funding Evaluation Plan (2017-2020);
- 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.

Actions promoting innovation in **agri-food** are in line with FoodWise 2025 – the ten-year strategy for the agri-food sector. They involve better access to consumer insight research (Action 4.11), funding of research in line with SHARP (the Sustainable Healthy Agri-food Research Plan) to improve the productivity and sustainability of production (Action 4.12). They also involve improving the coordination between industry, State agencies and

¹¹ These initiatives have been launched since the completion of the third Progress Report.

research institutions to enhance commercial benefits (Action 4.13) and the research absorption capacity of agri-food companies (Action 4.14). Finally, they provide for RDI investment in bio-based economy, rural development and along the food chain (Action 4.15) and the development of a bio-economy strategy (Action 4.16). A number of milestones have been achieved:

- The establishment of a high-level Innovation Team that will review the agri-food sector innovation capacity and capability and report to FoodWise High Level Implementation Group by Q2 2019;
- The launch of the Bord Bia Consumer Research and Market Insight Centre, the development of a Food Innovation Hub and the expansion of the Moorepark Research Centre and the forthcoming launch of a new SFI-DAFM funded Agri-Tech Research Centre;
- The launch of the National Policy Statement on the bio-economy and the establishment of a High-Level Bio-economy Implementation Group (co-chaired by DAFM and DCCA).

With one headline action to promote innovation in the **marine sector**, I2020 supports the implementation of the national strategy for the sector “Harnessing Our Ocean Wealth” (Action 4.17). The strategy provides for the publication and implementation of a national Marine Research and Innovation Strategy to 2020 (Action 4.17 a) and the implementation of the recommendations of the Interdepartmental Marine Coordination Group and the Development Task Force focusing on research translation and development (Action 4.18.b). In this regard, the announcement of a new Marine Innovation Park (Páirc Na Mara) by Údaras na Gaeltachta to complement the national aquaculture research cluster is a key development.

Progress is being made to promote innovation in the **environment** and **energy** sectors, the development and/or implementation of the research strategies for the sectors: the EPA Research Strategy 2014-2020 (Action 4.18) and the Energy Research Strategy (Action 4.20). Both are progressing.

The actions relating to the **natural resources** sector involve the implementation of the Geoscience Research Strategy (Action 4.21), the strengthening of a network to support researchers and business partners in addressing economic and societal challenges in the field (Action 4.22) and the completion of the INFOMAR (Action 4.23) and TELLUS (Action 4.24) programmes. They are all on course. A noticeable development is the strengthening of links between publicly funded research and the geoscience business cluster.

To promote innovation in **digital society**, I2020 supports the development of high impact digital enterprises (Action 4.19). DCCA funds the National Digital Research Centre and its accelerator programme.

The promotion of innovation in the **defence** sector involves two actions:

- The development of a Defence Enterprise Initiative to support Ireland-based enterprise will be supported by engagement with the European Defence Agency (EDA) and access to the EDA's and the relevant H2020 funding (Action 4.25.a) and by the strengthening of links between the Defence Forces and Ireland-based enterprise and research performing organisations (Action 4.25.b);
- The establishment of a Security and Defence Enterprise Group (Action 4.26) is delayed pending development on IP Policy for Defence Organisations;

Goal 5: The role of Intellectual Property in Innovation

With 13 actions relating to Intellectual Property, I2020 supports the creation of an intellectual property regime that encourages the creation of proprietary knowledge and its diffusion. It commits to

- Strengthen knowledge transfer for innovation;
- Promote more extensive commercialisation of public research;
- Seek to improve IP exploitation by Irish Enterprise;
- Position Ireland's IP framework to encourage innovation.

The status these actions is outlined below. Subsequently, progress is reviewed in greater details:

Completed (Actions 5.1, 5.2, 5.4, 5.5 and 5.13)	5	Delayed (Actions 5.8, 5.9 and 5.11)	3
Nearly completed (Actions 5.10 and 5.12)	2	Initiated	0
Progressing / on-going	3	Not yet Initiated	0

Strengthen knowledge transfer for Innovation

The following actions are completed:

- The publication of a revised IP Protocol (Action 5.1);
- The development of additional sets of resources and tools to encourage industry-academic collaborations (Action 5.2).

Promote more extensive commercialisation of public research:

The commercialisation targets (Action 5.3) are on course and one is already exceeded:

- 164 Licenses Options, Agreements and Assignments (the I2020 target is 175);
- 22 Spin-out (the I2020 target is 40);
- 15 High Potential Start-ups (the I2020 target is 16);
- 1,078 Collaborative Research Projects between enterprise and the public research system (the 2020 target is 920).

The actions relating to the new targets for the commercialisation of research for (Action 5.4) and the launch of a third Technology Transfer Strengthening Initiative (Action 5.5) are completed with the allocation of €34.5bn for the period 2017-2021.

Improve IP exploitation by Irish Enterprises

To increase the exploitation of IP by Irish enterprises, I2020 seeks to raise awareness and build the IP protection of capability of Irish enterprises with four actions. Two of these are progressing with:

- A range of initiatives to increase IP awareness among the broad public and entrepreneurs (Action 5.6);
- EI's pilot grants "IP Start" and "IP Plus" (Action 5.7).

Two actions are delayed:

- The opportunity to include modules on IP management in relevant courses will be informed by the data on the provision of IP modules generated through the Annual Strategic Dialogue process with HEIs (Action 5.8);
- The new indicators of IP activity in firms (Action 5.9) will be finalised in 2018 instead of 2017.

Position Ireland's IP framework to encourage innovation

The action relating to the Knowledge Development Box (Action 5.13) is completed.

The two actions relating to the modernisation of copyright legislation and its enforcement regime (Action 5.10 and 5.12) are nearly complete: the Copyright and Other Intellectual Property Law Provisions Bill 2018 is progressing through the Houses of the Oireachtas. Enactment is expected in Q4, 2018.

The action designed to improve the patenting options for business (Action 5.11) is stalled: progress on the implementation of the European Unitary Patent system depends on the outcome of a German constitutional challenge.

Goal 6: Innovating with the EU and the Wider World

Under Goal 6, I2020 seeks to facilitate, develop and exploit global research cooperation and reinvigorate our networks with global partners. With 22 actions, I2020 outlines that we will engage with the rest of the innovation world and:

- Deepen Ireland’s engagement in the EU, in particular through the Horizon 2020 programme;
- Deepen our engagement with the European Fund for Strategic Investment;
- Optimise European Structural Funds;
- Optimise our engagement in the European Research and Innovation Area;
- Work with other countries to develop our innovation system;
- Participate in International Research Organisations;
- Benchmark our innovation system against comparator countries.

The status of the actions is presented below. The progress to date is subsequently reviewed.

Table 6 - Status of the 22 Actions under Goal 6: Innovating with the EU and the Wider World			
Completed (Actions 6.12, 6.13 and 6.14)	3	Delayed	0
Nearly completed	0	Initiated	0
Progressing / on-going	17	Not yet Initiated (Actions 6.15 and 6.16)	2

Deepen Ireland’s engagement in the EU, in particular through the H2020 Programme.

Ireland’s engagement in the EU is progressing with four actions to:

- Secure €1.25bn funding from Horizon 2020 (Action 6.1) as the Irish research community obtained a €577m drawdown (August 2017 data);
- Catalyse the creation of and participation in consortia to bid for large-scale Horizon 2020 projects with the support of the Strategic Research Proposals Group (Action 6.1.a) and the Horizon 2020 National Support Team (Action 6.2.b);
- Influence the EU Commission in formulating the work programme and represent Ireland’s interests (Action 6.3).

Deepen our engagement with the European Fund for Strategic Investment

The action providing for the assessment of the EFSI’s potential for research and innovation (Action 6.4) is progressing. DBEI anticipates receipt of a report by the EIB evaluating new funding models and identifying additional sources of finance by the end of the year.

Optimise European Structural Funds

The action seeking to ensure full participation in the European Regional Development Fund (ERDF) and the European Territorial Cooperation (known as INTERREG) programmes is progressing: EI, MI and SFI are co-funding a number of ERDF Operational Programmes; DBEI and DOH are co-funding INTERREG programmes in Ireland.

Optimise our engagement in the European Research and Innovation Area

The pursuit of this objective is progressing with two actions: the coordination and oversight of participation in Joint Programming Initiatives (JPIs) (Action 6.6) and the involvement in JPIs and ERA_NET initiatives (Action 6.7).

Work with other countries to develop our innovation system.

The following 9 actions are progressing the international collaboration agenda:

- The HRB -SFI- Wellcome Trust co-funding for biomedical and clinical research in Ireland (Action 6.8.a);
- The SFI - Royal Society fellowship for early stage researchers based in Ireland (Action 6.8.b);
- A range of initiatives strengthening collaborations with major UK funders (Action 6.8.c);
- The development of Horizon 2020 proposals with UK research team, including teams based in Northern Ireland (Action 6.8.d);
- The increased collaborations between the 5 Irish and UK environmental agencies (Action 6.8.e);
- The development of joint funding opportunities with Northern Ireland, including with the support of the US-Ireland R&D Partnership programme (Action 6.9);
- The broadening of the remit of the US-Ireland R&D Partnership (Action 6.10.a);
- The support to NSF Graduate Research Fellow visiting Ireland (Action 6.10.b);
- The new support for research collaborations with China (Action 6.11).

Participate in International Research Organisations

The three actions relating to membership of key international organisations are completed:

- CERN membership discussions took place in 2016 (Action 6.12) and formal application for membership depends on the availability of funding in the future;
- Ireland formally applied for membership to ESO in Q1 2018 (Action 6.13) and accession is planned for October 2018;
- Membership of ELIXIR was secured in 2016 (Action 6.14).

The review of the membership of International Organisations (Action 6.15) will start in 2020.

Benchmark our innovation system against comparator countries

The benchmarking exercise (Action 6.16) has not yet been initiated but membership of the Small Advanced Economies Initiative (SFI, DBEI), Science Europe (SFI, IRC, HRB) and Global Research Council (SFI) provide opportunities to “Learn from, and adopt best known practice, policies and initiatives”.

Goal 7: Innovation Implementation

Goal 7 sets the framework for the implementation of this whole-of-Government Strategy with 11 actions:

- The I2020 Implementation Group;
- Links between the I2020 Implementation Group and other relevant groups;
- Independent advice and stakeholder input;
- Research Integrity;
- Measuring success;
- Standardised classification of public investment in research.

Progress on the actions is summarised below and reviewed in greater details.

Completed (Actions 7.1, 7.3.b)	2	Delayed (Actions 7.6.a, 7.6.b. and 7.6.c)	3
Nearly completed (Action 7.2.c)	1	Initiated (Action 7.5.a)	1
Progressing / on-going	3	Not yet Initiated (Action 7.5.b)	1

The I2020 Implementation Group

The action relating to the establishment of the Implementation Group (Action 7.1) is completed.

Links between the I2020 Implementation Group and other relevant groups

Engagement between the I2020 Implementation Group and other groups in the science and innovation area (Action 7.2) is ongoing.

Research integrity

Through the Research Integrity Forum, one action is still in progress: a range of initiatives has harmonised policy and practices for handling of research misconduct (Action 7.3.a) in all areas except data storage where work is still ongoing.

The following two actions are completed or near completion:

- The standardisation of the process and format for the publication of outcomes of research integrity investigations (Action 7.3.b);
- The development of a national shared audit scheme based on SFI pilot (Action 7.3.c).

Measuring success

Three actions relate to the evaluation of the strategy. Their status is as follows:

- Reporting to the Cabinet Committee on the implementation of the Strategy (Action 7.4) is ongoing. I2020 and the third progress report were most recently discussed at Cabinet in July 2018;
- The mid-term evaluation of the strategy (Action 7.5.a) has been formally initiated and is the subject of this Call for Submissions;
- The retrospective evaluation of I2020 (Action 7.5.b) will be initiated at the term of I2020.

Standardised classification of public investment in research

The completion of three actions relating to the classification of public investment in research (Action 7.6.a, 7.6.b and 7.6. c) is delayed. Completion of the project is contingent on resources.

Appendix 1 - Terms of Reference for the Mid-term Review of I2020

Innovation 2020 (I2020) is Ireland's strategy for research and development, science and technology for the period 2016-2020. The vision for the Strategy is for Ireland to be a Global Innovation Leader, driving a strong sustainable economy and better society. Reflecting the cross-Government approach of innovation policy, oversight of the Strategy rests with the Cabinet Committee and the Innovation 2020 Implementation Group (I2020 IG) – the interdepartmental group responsible for the implementation of the Strategy's 140 actions (including headline actions and sub-actions).

The Strategy provides that I2020 IG will lead a mid-term evaluation of this strategy so that "relevant adjustments can be made in a timely manner to ensure successful delivery on the vision and objectives" (action 7.5). The underlying objective of the mid-term review is to ensure that the Strategy adapts to changing circumstances and continues to deliver the vision and objectives for Ireland's research and innovation eco-system.

The review will be carried out by DBEI on behalf of the I2020 IG.

The objectives

The Review will inform the 2019 and 2020 workplans for the I2020 IG. The review will:

- Assess progress in achieving the targets set out in I2020;
- Assess progress in the implementation of the Strategy based on the I2020 Progress Reports for 2016, 2017 and 2018;
- Identify any changes in the national and international policy environment that impact on the objectives of I2020 and the delivery of the actions; and
- Review the actions as necessary to ensure that they continue to be aligned with the overall vision and objectives of the Strategy (attached in appendix).

Methodology:

The Review will include the following tasks:

- Assessment of progress against I2020 targets and other relevant benchmarks,
- Review of progress reports for 2016, 2017 and 2018,
- Identification of significant policy developments at national and EU levels,
- Consultation with the members of I2020 IG, and
- Online public consultation based on a Call for Submissions.

Timeframe

The draft final review will be submitted to I2020 IG in December 2018 for approval.

Appendix 2 - Glossary

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
DES	Department of Education and Skills
DOH	Department of Health
EDA	European Defence Agency
EIB	European Investment Bank
EI	Enterprise Ireland
EPA	Environmental Protection Agency
ERDF	European Regional Development Fund
ESFI	European Fund for Strategic Investments
ESO	European Southern Observatory
GBARD	Government Budget Allocations for Research and Development
GERD	Gross Expenditure on Research and Development
GSI	Geological Survey Ireland
GNP	Growth National Product
HEA	Higher Education Authority
HEI	Higher Education Institute
HRB	Health Research Board
IP	Intellectual Property
IDA	Ireland Industrial Development Agency Ireland
IRC	Irish Research Council
KTI	Knowledge Transfer Ireland
MI	Marine Institute
NSAI	National Standards Authority of Ireland
PRTL	Programme for Research in Third Level Institutions
QQI	Quality and Qualifications Ireland
R&D	Research and Development
RDI	Research, Development and Innovation
RTO	Research Technology Organisation
SBIR	Small Business Innovation Research
STEM	Science Technology Engineering and Mathematics
SFI	Science Foundation Ireland