



Evaluation of Ireland's Participation in FP7 and Horizon 2020 – DJEI Summary Report

July 2016



An Roinn Post, Fiontar agus Nuálaíochta
Department of Jobs, Enterprise and Innovation

Key Messages

This paper presents the key findings from the Technopolis evaluations of Ireland's participation in FP7 and Horizon 2020, concentrating on the main learnings and implications from a policy perspective. It provides the Department of Jobs, Enterprise & Innovation, the Horizon 2020 High Level Group, the National Support Structure and other relevant stakeholders with a range of options for consideration which could assist in Ireland's future participation in European Framework Programmes.

Overall, Ireland has performed well in the Framework Programmes (FP) to date, especially when adjusting for the size of our research base, indicating significant leverage of the programme relative to other countries. Ireland exceeded its target for funding under FP7, securing €625m in funding. Early indications are that Ireland is on track to achieve its target of €1.25 billion in funding under Horizon 2020, assuming current performance can be maintained.

Some of the most important findings of the evaluations relate to the added-value aspects of framework programme participation:

- The Framework Programme provides a high level of additional RDI that can only take place at a transnational level. Without FP funding, many projects would either not have gone ahead or have proceeded at a much reduced scale.
- The Framework Programme has good alignment with Ireland's national research priorities and also provides opportunities for researchers to target funding outside of priority areas, thereby complementing national funding, especially in areas without the scale to come within the priorities. In some cases, it also provides opportunity for securing larger funding than may be available nationally.
- The Framework Programme provides opportunity for access to and collaboration with experts that may not be located in Ireland, improving the overall quality of the research base domestically. International collaboration and working to international standards also has an important reputational enhancing effect.
- There are important impacts from a researcher career perspective in terms of progression, expansion of networks in addition to knowledge transfer and quality impacts from international experience gained which can be transferred back to Ireland.
- The evaluations also provide reported impacts for enterprise with regard to development and adoption of new technologies and increased turnover, employment and productivity. There are some tangible impacts evident in terms of licences, spinouts, patents and scientific publications.

Overall, the evaluations indicate that the National Support Structure for the Framework Programme in Ireland is relevant, efficient and effective and that it delivers a range of benefits for the research community in terms of information, advice and navigation through the programme. There are clear and positive correlations between engagement with the support network and increased likelihood of success.

There are certain areas of the programme where Ireland is punching well above its weight, such as the level of participation and success by SMEs, the performance of ICT sector, and Marie Curie Actions

including Marie Curie Co-Funding. Under FP7, Irish organisations took the leadership of consortia role at a rate matching that of our key competitors and substantially ahead of the EU average.

There are areas where a more strategic approach could be considered, for example, a greater central push and more co-ordinated approaches with regard to engagement in Framework Programme Strategic Initiatives and Co-Funding programmes. Related to this, the evaluations also find that there may be scope for better co-ordination at national level for targeting ways at influencing the Framework Programme agenda, targeting strategic alliances and ensuring appropriate senior engagement at relevant committees.

Based on our performance in FP7, relative to some of our close competitors, there may be scope to raise ambition in terms the scale of funding targeted at project level in addition to further building on our success in leadership of consortia. There is a substantial pool of agency clients that have received R&D supports but have not been engaged in the Framework Programme and represent an opportunity for further targeting and expansion of participants.

Ireland's targets for participation in Horizon 2020 are not provided for at a detailed level and the evaluations make some recommendations for raising our ambition in certain areas. There are aspects of the programme where, if more focus and perhaps resources are applied, there could be significant payoffs.

The recommendations from Technopolis provide a range of options aimed at building on our success to date and strengthening Ireland's engagement in the framework programme, including targeting greater participation around national priorities, increasing the scale of participation and maximising success rates. There are a number of levers Ireland can draw on to further enhance its performance. These include improving potentially assigning additional NCPs to cover specific aspects of the programme not currently assigned, measures targeted at success rates, expanding the pool of participants, raising ambition/targets in certain areas, more strategic engagement in committees and Strategic Initiatives and further developing our overall strategy and key performance indicators. They are not prescriptive and their merits, timing, resource implications and practicalities will need to be considered by DJEI, the High Level Group and other relevant stakeholders.

Overall, it is important to note that the recommendations are about building on what is primarily an effective system of support and good performance rather than a wholesale change to the existing approach.

1. Introduction

In December 2015, the Enterprise Programmes & Policies Evaluation Unit in DJEI commissioned Technopolis Group to undertake an Ex-Post Evaluation of Ireland's Participation in FP7 (2007-2013) and an Interim Evaluation of Ireland's Participation in the Eight Framework Programme, Horizon 2020 (2014-2020). The evaluations were undertaken from January to May 2016 and were overseen by a Steering Committee, chaired by DJEI and comprising representatives from IDA Ireland, Enterprise Ireland, Department of Education & Skills, HEA/Irish Research Council, Science Foundation Ireland and DJEI's Innovation, Research and Development Division. Prof. Iulia Siedschlag from the ESRI participated as the independent expert. The Steering Committee met on five occasions during the evaluation process.

Evaluation Objectives and Methodologies

The evaluations are concerned with:

- 1) The role of the Framework Programmes in assisting the development and advancement of Ireland's national innovation system; and
- 2) Ireland's participation in the context of our relative performance vis-à-vis our targets and competitors.

The evaluation terms of reference placed a priority on how future participation in Framework Programmes can be best aligned with national STI objectives, including maximising and increasing levels of participation, investment and scale. In this context, the evaluations have a strategic focus in terms evidence of lessons learned, outcomes and impact. In essence, the evaluations are aimed at establishing:

- Ireland's performance in FP7
- Impacts of engagement
- Identification of successful engagement
- Underperformance and associated lessons for future engagement
- Implications for participation in Horizon 2020
- Progress to date in the Horizon 2020 programme
- Measures for enhancing strategic engagement in the Framework Programme

The major themes covered by the evaluations are Ireland's participation and performance; participant experience; economic, scientific and societal impacts; synergies with the national innovation system; the effectiveness of the national support structure; influencing the research agenda and enhancing future participation.

There were also specific interests in certain aspects of the Framework Programmes requested by stakeholders to be covered in the evaluations including:

- Impacts on researcher careers and mobility;
- Financial supports for applicants; participation by enterprises, particularly SMEs;
- A case study on the ICT sector;

- Ireland's participation in Framework Programme strategic initiatives, including Joint Technology Initiatives (JTIs) and European Technology Platforms (ETPs);
- Ireland's engagement in co-funding initiatives such as ERA-NETs, Marie Curie Co-Fund and Joint Programming Initiatives (JPIs).

The evaluations have combined a mixture of methodologies including econometric analysis; European Commission Corda Database of Framework Programme projects; benchmarks of international performance; case study techniques; and a validation workshop involving 50 participants from the support system, higher education, enterprises and policy stakeholders. A total of 76 interviews were held with high level stakeholders and programme participants. In addition, an extensive survey was undertaken of FP7 applicants (729 respondents) and Horizon 2020 applicants (651 respondents).

Section 2 of this paper focuses on the key findings and lessons from a policy perspective from the Ex-post Evaluation of Ireland's participation in FP7. Section 3 reflects the key findings from the Interim Evaluation of Ireland's Participation in Horizon 2020. Section 4 presents the evaluation recommendations and options for future consideration by DJEI, the National Support Structure and the Horizon High Level Group.

2. Ex-Post Evaluation of Ireland's Participation in the Seventh European Framework Programme (FP7)

2.1 The Seventh European Framework Programme (FP7)

Overview and Ireland's objectives for participation

In broad terms, the Framework Programmes for Research and Innovation have two main strategic objectives:

- To strengthen the scientific and technological base of European industry;
- To encourage industrial international competitiveness, while promoting research that supports EU policies.

FP7 was the EU's main instrument for funding research in Europe for the period 2007-2013. With a total EU budget of over €50 billion, FP7 represented a 41 percent real increase in funding from its predecessor FP6. In order to complement national research programmes, activities funded under FP7 must have 'European added value' which can include co-operation/collaboration but also activities that raise competition between scientists in fundamental frontier research from the national to the European level. FP7 was designed to be larger and more comprehensive than its predecessors, with more flexibility and simplified procedures.

FP7 had the overriding aim of contributing to the European Union becoming the world's leading research area. Building and learning from previous Framework Programmes, it was designed with the objectives to strengthen industrial competitiveness and to meet the research needs of other Community policies, thereby contributing to the creation of a knowledge-based society, building on a European Research Area and complementing activities at a national and regional level. FP7 provided a good measure of continuity with FP6 and continued to be based largely around collaborative research (Cooperation) and mobility of researchers (People). However, it also contained a number of new elements, the most important of which was "Ideas" which provided the funding for the new European Research Council.

Among the objectives of the Framework Programme, transnational cooperation, frontier research based on excellence, and the strengthening of the human potential in research and technology were particularly highlighted by the EU. Other objectives laid down by the European Parliament and the Council were the promotion of a dialogue between science and society, facilitating the career development of researchers, strengthening of research capacities and ensuring wide use and dissemination of the knowledge generated by the research funded through the Framework Programme. An overview of the structure and budgets for FP7 is provided in Table 1 below. Each thematic area (Co-operation, Ideas, People, and Capacities) includes a number of sub themes.

FP7 – as with prior framework programmes – had a very high strategic importance for Ireland and there was the expectation that the programme would complement "national initiatives and programmes designed to strengthen research capacity in industry, in higher education institutions and in other parts of the public sector"¹.

¹ Recommendations for a Support Structure, Forfás (2009)

Table 1 FP7 Structure and Budgets

Theme	€m	% of total
Co-operation Including Health Food, agriculture and biotechnology, Information and communication technologies, Nanosciences, nanotechnologies, materials and new production technologies, Energy, Environment (including climate change), Transport (including aeronautics), Socio-economic sciences and the humanities, Security and Space, Joint Technology Initiatives	32,413	64
Ideas – European Research Council	7,510	15
People Including Initial Training, Life-long training, Industry-academia, International dimension, Specific actions	4,750	9
Capacities Including Research infrastructures , Research for the benefit of SMEs, Regions of knowledge, Research potential, Science in society, Coherent development of research policies, International co-operation	4,097	8
Non-nuclear actions by the Joint Research Centre	1,751	3
Total	50,521	100

Source: https://ec.europa.eu/research/fp7/understanding/fp7inbrief/structure_en.html

The programme was expected to provide enterprise, academic and other public sector researchers with:

- Access to research networks and opportunities to collaborate with leading research teams throughout Europe – this opens up collaborative opportunities well beyond the scale and scope of anything that can be achieved in a purely national context;
- Access to a pool of talented researchers throughout Europe who can come to work in Irish research institutions and Irish companies and contribute to the research goals of these organisations;
- Access to specialist research infrastructures throughout Europe including infrastructures that could never be provided in a purely national context;
- Opportunities for Irish researchers to take up positions in other countries with benefits for them personally (in terms of career advancement) and for Ireland in the longer-term (in terms of skills they bring back on their return).²

The programme was also seen as an opportunity to showcase Ireland’s scientific capabilities and to foster the commercialisation of research outputs.

² Idem

In addition to the benefits outlined above, there was also the understanding that the programme could act as an important source of funding for research in Ireland, beyond the Exchequer.

A Programme Logic Model for Ireland's engagement with FP7 is provided in Appendix I, tracing through Ireland's objectives for participation through to inputs, activities, outputs and intended outcomes and impacts. Notably, from an evaluations perspective, this logic model has been created ex-post the programme. Good practice for programme engagement would set this out ex-ante with a view to evaluating at a later date. This is developed further in the recommendations.




National Support Structure for FP7

In order to extract the maximum benefit from the opportunities available within FP7, a dedicated support structure was put in place. Through this support structure, a mix of guidance, advice and financial assistance was available to encourage researchers and enterprises, where appropriate, to avail of the opportunities within the programme. The key elements of the structure have continued under Horizon 2020 and are summarised briefly below:

- A **National Director for FP7** was appointed to lead a team based in Enterprise Ireland ensuring that a coordinated and coherent approach was adopted towards FP7 across all of the Government Departments, agencies and other organisations involved.
- The **national office for FP7** (located in Enterprise Ireland) provided the first point of contact for researchers and enterprises interested in participating in FP7. The office was responsible for general awareness raising activities and provided a range of services to other Government Departments, agencies and organisations involved in the support network (e.g. specialist advice, researcher targeting etc.).
- Enterprise Ireland put in place a **Brussels office** which (amongst other activities) provided a "brokering" service to help researchers and enterprises to identify potential partners in other Member States. The Brussels office also facilitated links to key individuals in the European Commission and in other EU institutions.
- A network of **National Contact Points (NCPs)** was put in place by Enterprise Ireland covering each of the subject areas in FP7 to ensure that researchers and enterprises have a nominated individual who they can turn to for practical advice and assistance with regard to availing of FP opportunities. The NCP role is (for the most part) a full-time role and there was greater uniformity in terms of service delivery.
- **National delegates** were also appointed to each of the programme committees that operated in FP7. The role of the national delegates was to represent Irish views at EU meetings and to work closely with the NCP in their area to identify and facilitate strategic opportunities for Irish involvement in their own part of the programme and in FP7 generally.

2.2 Ireland's Targets and Participation

Table 2 - Overview of Ireland's participation

High points		Areas for Improvement	
150%	Ireland secured more than 150% of its original target for FP7 (and three times the FP6 drawdown)	48%	Ireland only managed to secure 48% of its target for the ERC (Ideas pillar)
	Ireland ranks among the Top 10 countries in terms of SME participation (drawdown), taking account of the number of SMEs that operate in the country)		Project coordination was highly dominated by HEIs, in contrast with pattern of participation from other countries where there is more active participation from companies
	The ICT programme and Marie Curie Actions are the two main successes in FP7 (with a drawdown of €113M and €126M respectively). Ireland secured almost 10% of total Commission funding for Marie Curie co-fund actions.		

Ireland took part in 1,465 projects with a drawdown €625M (compared to €199M in FP6). This was 56% more than the original target of €400M (set in Strategy for Science, Technology and Innovation) and 4% more than the revised (and official) target of €600M.³

Table 3 - Drawdown and target

	Initial target	Revised target	Final drawdown
EC Contribution	€400M	€600M	€625M
% Of total EC Contribution	0.9%	1.3%	1.4%

Source: Technopolis 2016, based on CORDA and SSTI

Success Rates

Irish organisations submitted a total of 7,440 proposals to FP7. The majority of proposals were submitted to the Cooperation Specific Programme (57%), followed by People (21%), Capacities (12%) and Ideas (9%). The success rate (percentage of applications receiving funding) of all applications involving Irish participation was 20.2% in FP7, which is in line with the average for all EU Member States (20.1%).

³ Ireland's initial target of €400m in EC contribution (funding) was set out in the Strategy for Science, Technology and Innovation (SSTI) before the final structure and budgets for the programme had been finalised. The target was revised after a bottom up exercise with national delegates and NCPs combined with an ambition of achieving 1.25 per cent of activity producing a target of approximately €600m.

Profile of Participation

In total, **433 different organisations** have taken part in the programme accounting for a total of **1,960 participations in 1,465 projects**.⁴ These 433 organisations include 25 Higher Education Institutions and 52 public organisations and research organisations. A total of **332 companies** (including 249 SMEs) have taken part in FP7.

A relatively small number of projects (23%) included **more than one Irish organisation** (the average participation per project was 1.3) In terms of regional participation, **53%** of the total drawdown was in the Dublin region.

Comparative performance

Countries such as Finland and Denmark have performed slightly better in FP7 in comparison with Ireland, as is shown in the table below. They have had higher drawdowns as a result of taking part in more projects and by taking a slightly bigger share of those projects in comparison with Ireland. Additionally, a large pool of different Finnish and Danish organisations have taken part in FP7 projects (almost 600 in Denmark in comparison with 433 in Ireland). Table 4 also shows the (average) results for the EU28 and E15 countries. These statistics are dominated by countries with a high volume of projects, including the UK (10,372) Germany (8,805), France (7,201), Spain (6,327) and Italy (6,233).

Table 4 Participation by Ireland and select comparators

Pillar	Number of projects	Total EC drawdown (In € M)	Average EC drawdown per project (In € M)	Number of unique orgs.	Number of participations	Average participation per project
Ireland	1,465	625.2	0.4	433	1,960	1.3
Austria	2,440	1,188.1	0.5	747	3,543	1.5
Denmark	2,021	1,072.3	0.5	596	2,786	1.4
Finland	1,784	877.4	0.5	533	2,731	1.5
Netherlands	5,047	3,393.5	0.7	1,524	8,251	1.6
EU-28 (Average)	2,544	1,447.9	0.6	880	4,225	1.7
EU-15 (Average)	4,189	2,575.3	0.6	1,426	7,167	1.7

Source: Technopolis analysis of Corda data

⁴ Sometimes there is more than one Irish participant per project (see section on local collaborations).

Even though Ireland secured a relatively low volume of EC drawdown from FP7, in absolute terms, and in comparison with the four-comparator countries, its performance is much stronger once the size of its research base is accounted for (no. of researchers). Ireland's drawdown per researcher (over €42,000) was the third highest of all EU member states, behind the Netherlands and Belgium), but substantially ahead of countries such as the UK, France and Germany (ranging between approximately €21,000 to €29,000 drawdown per researcher). Similarly, Ireland has 647 participations for every thousand researchers working in-country, in comparison with 564 in the Netherlands and 356 for the EU average overall. A question for the future is how best to manage any capacity implications that arise for targeting increased participation from an already highly leveraged research community.

Programme Areas

Ireland performed well across large parts of FP7, meeting or exceeding its targets in 13 out of the 20 FP7 specific programmes and thematic areas.

Within the Cooperation Specific Programme, it performed particularly well in ICT, Nanotechnology and Security. It also performed well in the Capacities (research for the benefit of SMEs) and People Specific Programmes. However, it fell short of its targets in Energy, Space and Transport and applications were only around half of the target value in in the 'Ideas' pillar (ERC).

Table 5 - FP7 Targets and participation

FP7 Area	Total EU Budget (in € M)	Budget Available for Calls (in € M)	Proposed Target for Irish Share of Activity (in € M)	Target for Funding to Irish Participants (in € M)	Funding to Irish Participants Achieved € M	% Target achieved
Cooperation	32,413	30,818	1.20%	369.2	398.0⁵	108%
of which:						
Health	6,100	5,946	1.25%	74.3	77.9	105%
Food, Agriculture and Biotech	1,935	1,886	2.00%	37.7	40.9	108%
ICT	9,050	8,822	1.25%	110.3	126.4	115%
Nanotechnology	3,475	3,388	1.25%	42.4	54.7	129%
Energy	2,350	2,291	1.25%	28.6	19.8	69%
Environment	1,890	1,842	0.80%	14.7	18.2	124%
Transport	4,160	4,055	1.00%	40.5	15.9	39%
Space	1,430	600	0.80%	4.8	3.4	71%
Security	1,400	1,365	0.80%	10.9	28.0	256%
Social Sciences and Humanities	623	623	0.80%	5.0	5.3	106%
Ideas	7,510	7,510	1.40%	105.1	50.5	48%
People	4,750	4,750	2.00%	95.0	112.7	119%
Capacities	5,848	3,897	1.06%	41.3	63.5	154%
Research Infrastructures	1,715	1,515	0.80%	12.1	15.7	130%
Research for Benefit of SMEs	1,336	1,336	1.60%	21.4	35.6	166%
Regions of Knowledge	126	126	1.60%	2.0	2.8	140%
Research Potential	340	340	0.00%	0	0.6	(0.6M)
Science in Society	330	330	1.00%	3.3	8.3	248%
Development of policies	70	70	1.00%	0.7	0.1	14%

⁵ The €398 million figure includes an additional €6.7 million for Joint Technology Initiatives and 0.5 million for General Activities for which there were not programme specific targets.

FP7 Area	Total EU Budget (in € M)	Budget Available for Calls (in € M)	Proposed Target for Irish Share of Activity (in € M)	Target for Funding to Irish Participants (in € M)	Funding to Irish Participants Achieved € M	% Target achieved
INCO	180	180	1.00%	1.8	0.4	22%
Non-nuclear Activities of JRC	1,751	0	0.00%	0		--
Total EC	50,521	46,976	1.30%	611	624.7	102%
Euratom	2,751	2,230	0.20%	4	0.383	10%
Total EC and Euratom	53,272	49,206	1.25%	615	625.0	102%

Source: Ireland's Participation in FP7, Revised Indicators and Targets (October, 2007)

Participating organisations

In terms of profile of participant organisations, Ireland's Higher Education Institutions (HEIs) dominate the drawdown figures, accounting for 65% of total drawdown (€409m), with Ireland's companies accounting for 26% (€164m) of total funding secured. The universities and institutes of technology also dominate Ireland's project coordinators, accounting for around 86% of all of the country's coordinators compared to 57% for the programme overall. This result contrasts with the pattern of participation from other countries, where companies tend to take the leadership role more frequently. This suggests that Irish companies could be encouraged to be more active in this role given that this would likely lead to stronger, more intense participation in projects, not only in terms of drawdown but also in terms of intensity of involvement overall.

SME Participation

Irish SMEs had a strong participation in FP7, with a drawdown of €118.5m or 72% of total drawdown by companies. SMEs were most active in the areas of Research for the Benefit of SMEs, Health and ICT. Ireland is the fifth highest performing country in terms of SME drawdown per 1,000 SMEs and third within the Research for the Benefit of SMEs programme.

2.3 Partnerships and collaborations

Co-ordination role

Ireland performed strongly in terms of its leadership of FP7 actions, with Ireland hosting the project coordinator role in 30% of all of its participations.

Ireland matches the project coordination activity and income levels achieved among the four selected comparator countries (Netherlands, Austria, Denmark, Finland), and are substantially ahead of the average figures for all EU member states (19%).

Partnerships with other Member States and Third Party Countries⁶

91 percent of partner countries that participate in projects in which there was Irish participation are EU member states, broadly in line with comparator countries.

Germany, UK, Spain, France, Italy and the Netherlands are the countries with which Irish organisations collaborate the most, which is a reflection of the scale of participation by those countries in the programmes. When Ireland takes the co-ordinating role, the highest number of participations come from the UK, then Germany, Spain, France and Italy. Further analysis of Horizon 2020 data to date indicates that:

Out of total participations by Ireland to date, 98 (16%) have had collaboration with a UK participant, accounting for €63m (23%) of total funding won to date;

Where Ireland takes a co-ordination role, 27% of total co-ordination projects to date have a UK collaboration and account for €46.7m or 31% of the total funding for participation's where Ireland has taken a co-ordination role; and

Where Ireland takes a participant role, the reliance on the UK is not as pronounced, accounting for 10% of total participations and 13% of total funding where Ireland takes a participant role.

Finally, another notable finding on collaborations is that local collaborations (more than one Irish participant on a project) seem to drive higher levels of company participation in the programme. In FP7, where there is more than one Irish participant, 44 percent of local collaborations are by companies. This increases to 66 percent when a HEI takes the co-ordination role in a project.

2.4 Participation in strategic initiatives

Ireland has had varied success in FP7 Strategic Initiatives, with high success in Marie Curie Co-Fund but less participation in Joint Technology Initiatives and ERA-NETs.

The three main Strategic Initiatives Ireland participated in under FP7 were Marie Curie COFUND; Joint Technology Initiatives (JTIs) and ERA-NETs. Marie Curie COFUND scheme aims to stimulate regional, national or international programmes to foster excellence in researchers' training, mobility and career development, dissemination of best practices and by co-funding new or existing regional, national, and international programmes. Ireland performed strongly within the FP7 Marie Curie COFUND actions, securing eight COFUND programmes in total and €21.5M in EU contributions, which is approaching 10% of the total Commission funding for the scheme overall. This was a new initiative in FP7, and the level of Ireland's engagement is a clear indication of the country's ability to identify and respond to new opportunities.

JTIs were new mechanisms introduced in FP7 as a way of realising more efficient investment by bringing together public-private partnerships at the European level. This instrument combines private sector investment and/or national and European public funding, including grant funding from the FP

⁶ As the EU enlarged, candidate countries had the chance to participate in research collaborations through the Framework Programmes, sometimes years before they became members. A wider international dimension was progressively built into EU research policy. Transnational cooperation was progressively extended to more and more countries beyond the EU, across the entire world. That process culminated in the opening of all EU research programmes to the participation of teams from non-EU countries.

and loan finance from the European Investment Bank (EIB). Irish participation in the Joint Technology Initiatives (JTI) was limited, with a level of engagement that was considerably below what has been achieved for FP7 overall (0.6% versus 1.4% of EC Contribution secured by Irish organisations over the total funding available). Ireland was most actively engaged within the Nanoelectronics JTI. Key stakeholders argued that these initiatives continue to be of strategic importance, and that Ireland should increase efforts in order to pursue engagement at a more appropriate scale within Horizon 2020.

The objective of the ERA-NET scheme was 'to develop and strengthen the coordination of national and regional research programmes' such that the volume of research funded by member states might be effectively increased as a result of improved coherence and reduced duplication. Ireland's government departments and research funders were partners in eight of the 31 ERA-NET projects funded through FP7, covering a range of different themes, from the economic viability of the rural economy (RURAGRI and the AFDA) to environmental health (ERA-ENVHEALTH and the EPA) to migration in Europe (NORFACE Plus and Irish Research Council for the Humanities and Social Sciences). In most cases, the focus of these FP7 ERA-NET projects is closely linked with the Irish organisation's policy and research priorities, which is a very positive outcome.

The ERA-NET instrument has also provided a platform for Ireland's science funders to pool and leverage EU funds, with funds available nationally for basic science (e.g. SFI and nanoscience through NanoSci-EPlus). Taken together, eight ERA-NETs have produced around 35 participations, with around 31% in the area of 'Food, Agriculture and Biotechnology', where Teagasc has had an active participation.

2.5 Participant experience

Motivations and satisfaction

According to the survey results, access to funding is the most widely reported driver for participation in FP7 for universities and research institutes, which is in line with results from past evaluations. Other widely reported motivations are improved access to international scientific networks and enhanced reputation (in the case of HEIs and research organisations). Businesses cite a cross-section of motivations, with a similarly broad endorsement of four or five distinct ambitions, ranging from support for developing a specific innovation through to progressing a strategic goal or developing in-house capability.

Engagement with national contact points

Ireland's FP7 applicants made good use of the country's network of National Contact Points (NCPs), with around two thirds of all applicants that responded to the survey having made use of the support on offer. Even allowing for some degree of positive bias, this suggests that a majority of FP7 applicants were in receipt of support.

Feedback shows that the applicant base made most extensive use of the NCP network's signposting functions and proposal writing advice. Moreover, a significant minority made use of various more involved activities such as assistance in searching for partners.

The community perceives great advantages of engaging with NCPs, mostly related to understanding critical success factors for applications and raising their awareness of the strategic relevance of the programme. Given the positive differential in performance of assisted applications, relative to non-assisted bids, the evaluation of FP7 suggests that there would be benefit in exploring ways in which to increase the proportion of all applicants that have had some level of guidance and advice from the NCP network.

2.6 Main outcomes and benefits from participation

Main benefits

According to survey evidence, FP7 has had a series of positive benefits on participant organisations. Access to international networks as well as advancements in knowledge and scientific capacity are the top benefits that have emerged from participation in FP7. There have also been positive effects concerning research and technological capacity of participant organisations and in the willingness to invest in R&D and innovation projects.

Findings emerging from the ICT case study (but that are relevant across thematic areas) show that:

- Participation in the FP provides research organisations and large enterprises with knowledge and expertise that allows them to broaden fields of activity and/or to develop new technologies, thus creating business opportunities.
- Research actors and SMEs in the field of ICT services that strive for a presence on the international market emphasise the opportunity the FP offers in developing an international brand, to be recognised for doing 'state-of-the-art' research and to set up relationships with potential customers outside Ireland.
- For SMEs a major benefit from FP participation is the development of relationships with customers and the development of client knowledge.
- Research organisations and SMEs that strongly depend on competitive funding for their sustainability indicate reputation building as a major benefit.
- Several of the ICT research centres that have knowledge transfer to local industry as part of their mission consider success in the FP critical to reaching their objectives.

Research commercialisation

Participation in FP7 has produced tangible research commercialisation outputs. The evaluation estimates that circa 228 patents have been generated from FP7 that is specific to Ireland. This is equivalent to 0.2 patents and 0.1 license agreements per project.

According to calculations made by Knowledge Transfer Ireland, a total of 20 licenses and a total of 13 spin-outs had a EU-funding component (not necessary all related to FP7). The estimations looks at the EU funded spinouts and licenses from 2008-2015 (1 year post start of FP7 and 2 years post end of FP7, to allow for a time lag at either end).

Career mobility

Ireland was fully engaged with Marie Curie, and benefited from substantial numbers of incoming early career researchers, bringing to Ireland their particular scientific experience and international networks. Ireland has also seen quite large numbers of its own researchers taking advantage of the scheme, as a means by which to progress their own careers and broaden their horizons internationally. The evaluation survey confirmed the following substantial benefits gained by FP7 Marie Curie Fellows:

- Marie Curie Actions contribute towards career mobility for researchers in terms of career progression. MCA does not seem to have significant effects in achieving mobility of researchers in terms of geography or sector, and this goes in line with prior findings for the Marie Curie long-term evaluation study.
- Marie Curie Actions are also a good platform for fellows to get access to international expertise and extend their networks.
- It is also a tool for the institutions' postdocs to gain experience internationally. There is also the element of knowledge transfer: when they return they share the gained knowledge and skills with the other postdocs in their institute.
- There is also the benefit of staff exchange, which implies access to facilities that are not available in the 'mother' institution (e.g. data sources) to carry out research.

2.7 Synergies with National RDI System

Effects of domestic and international environment

According to survey evidence, pressures within the domestic environment had an effect on Ireland's applications to FP7, with the economic crisis placing a downward pressure on many national budgets, thereby encouraging organisations to make applications where they might otherwise have looked for national support.

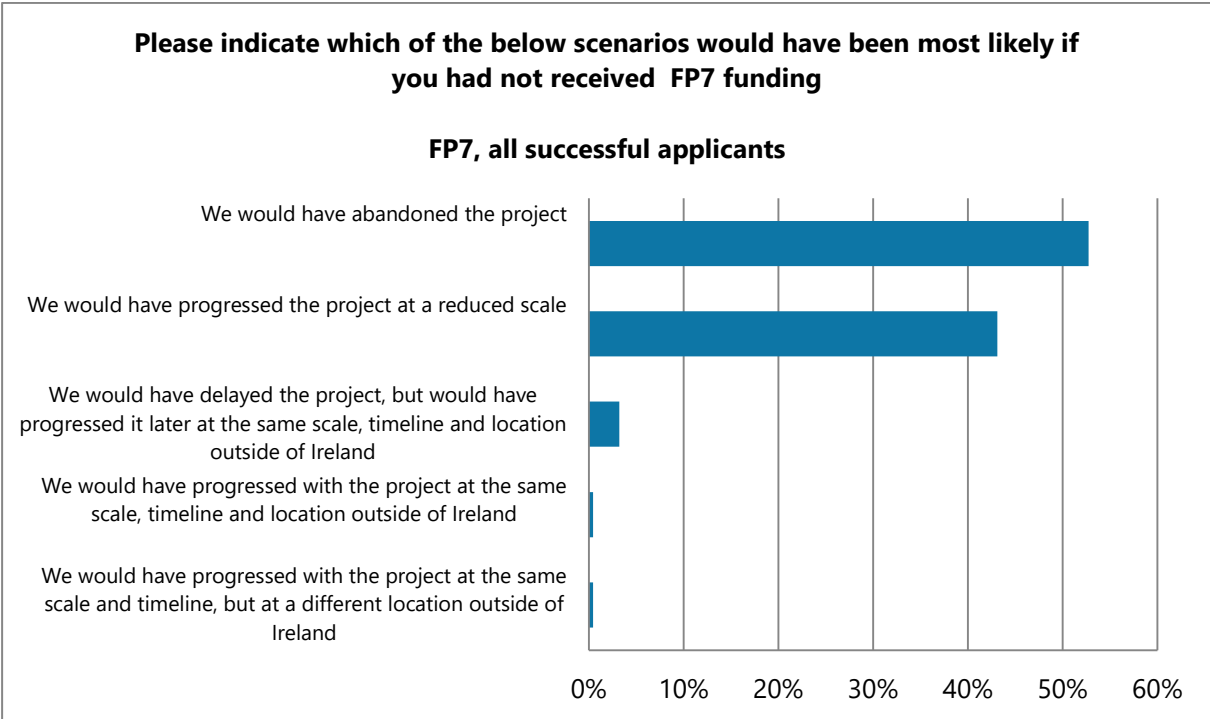
Added value of FP7

The survey analysis provides further evidence of the added value of FP7 funding as the majority of respondents state that they would have to ceased their projects had they not received FP7 funding.

The majority of respondents (and successful applicants) indicated that they would have abandoned the project had their project not received FP7 funding (53%). Furthermore, 43% of respondents indicated that they would have progressed the project, but at a reduced scale.

Very few respondents to this question (3%) suggested that they would have progressed at the same scale, timeline and location (outside of Ireland) had the project not received FP7 funding. The same answers were consistent across all stakeholder groups.

Figure 1 - Added value of FP7 funding, all successful applicants



Source: Participant survey, Technopolis (2016). Base: 218 respondents

Examining the same topic with unsuccessful applicants reveals that the anticipated scenarios reflected what actually happened to projects that were not funded. 48% of unsuccessful applicants stated that they actually abandoned their project, while 36% stated that they progressed their project at a reduced scale. 13% stated that they delayed the project but carried on later at the same scale, timeline and location outside of Ireland.

Interview data largely reinforces those views expressed in the survey. A majority of those interviewed believe that participation in Framework Programmes provides substantial added value. In particular, interviewees mentioned the scale of Framework Programme projects as being greater than those that could be supported by national funding.

Alignment with National Priority Areas

In terms of the alignment of Ireland’s 14 Research Priority Areas align with the thematic focus of the FP7 specific programmes and calls for proposals, overall, analysis suggests that around 60% of Ireland’s drawdown from FP7 has gone to support work in areas that sit outside the 14 national priorities. This is a first approximation and does not account for the high volume of multidisciplinary research across the Framework Programme which may also have NRP relevant research. Notably, Research Prioritisation was initiated towards the end of the Framework Programme. It would be of interest to carry out a similar analysis on Horizon 2020 to assess if there has been greater alignment within the new programme and/or assess the relevance of the Framework Programme in the next iteration of the National Research Prioritisation exercise.

The view from stakeholders is that the value of the FP is at least in part its breadth and ability to support research and innovation projects in areas that do not have the scale or criticality to constitute a national priority. The FP can help to sustain national capability – and international networks – in a diversity of niche topics. From this perspective, balance is required between increasing concentration on national strengths and ensuring national access to smaller fields and a wider range of subjects.

In this context, FP7 has provided substantial financial support for research in Ireland both within the national priority areas and in areas that fall outside the priorities and is therefore complementary to rather than competing with the national innovation system.

Links between national R&D supports and FP7

The evaluation found a number of positive links between national R&D and FP7, beginning with a view from HEIs and public research organisations in particular that national programmes provide a valuable underpinning for subsequent success within the European RTD Framework Programme. There are also examples of research fields that sit outside national research priorities where FP7 has provided access to funding that would not have been available locally.

Links between the funding opportunities in FP7 and the Irish R&D

The evaluations identified an important pool of EI and IDA client companies that have not taken part in FP7. Those companies (circa 1,600 in total) represent an untapped potential in terms of prospective applicants and participants in future FPs.

Survey responses provided a strong suggestion of the complementarity and additionality of Framework Programmes with the funding available at national level for Irish-based companies. FP7 provided opportunities for Irish-based companies to secure much larger sums than were available nationally in some instances and to secure funding covering many more areas of industrial applied research than were available nationally, which indicates that FP7 provided good complementarity to national resources.

2.8 Impact

It has been difficult to fully capture the impacts of FP7, due to issues such as lack of data and the relatively short timeframe since the programme conclusion. In this context, the evidence primarily relies on estimates and indicators of impacts.⁷

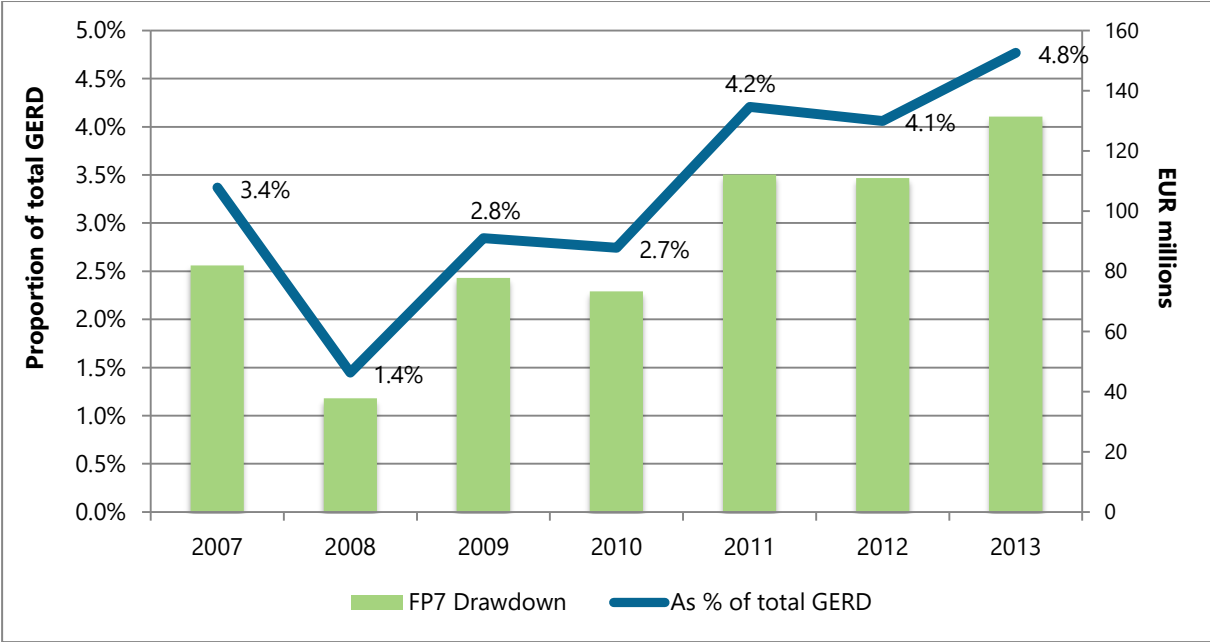
Economic

The majority of survey participants from companies stated that participation in FP7 led to positive economic outcomes in terms of increased employment (73%), increased turnover (6%) and increased productivity (64%).

⁷ Significant efforts were made to undertake a best practice counterfactual impact assessment using Propensity Score Matching and Difference-In-Difference techniques, however, due to lack of data at firm level this was not possible (see methodology section in Technopolis FP7 report).

Based on ratios calculated in the context of prior evaluations of FP7 the evaluators estimate an EC contribution of €625M would lead to (i) a total investment of €1.1bn (i.e. a leverage of €0.46bn), (ii) a total contribution to Ireland’s GDP equivalent to an annual GDP growth of €300M, (iii) an estimated 2,000 jobs created per year. As shown below, FP7 annual drawdown has been equivalent to 1%-5% of the total annual Gross Expenditure on R&D (GERD) in Ireland and, as such, it represents a substantial contribution to the total R&D spend.

Figure 2 - FP7 drawdown and total intramural R&D expenditure in Ireland



Source: Technopolis, based on CORDA and Eurostat (Total intramural R&D expenditure (GERD) for all sectors of performance [rd_e_gerdtot])

Scientific

According to European Commission SESAM/RESPIR data, a total of 622 projects with Irish participation are registered in the dataset (42% of total number of projects). The data shows that 362 projects (out of 622) have had at least one publication (at the end of the project). Furthermore, a total of 7,267 publications have been registered across those projects (11.5 publications per project) and 3,187 (44%) correspond to publications submitted to High Impact Peer Reviewed Journals. The Framework Programme was also valuable as a means to wider networks, and as a way to have scientific and research results disseminated to a broader audience than would otherwise be possible.

Societal

Irish organisations have taken part in projects that could have tangible societal impacts, with 122 projects reporting an impact on EU policy (SESAM/RESPIR). Understanding those impacts would require the conducting of individual case studies at project level (which was out of the scope of this study). However, an overview of a selection of projects and their final reports shows that FP7 has

funded research that could help Ireland to address societal challenges (including those related to public health and climate change) and also to improve public engagement in science and science education.

2.9 Conclusions

Ireland performed well against its targets for FP7, with a drawdown of around €625M, which was more than three times the drawdown realised in FP6 and more than 150% of its original target for FP7.

FP7 has delivered a series of benefits to participant organisations that range from enhanced access to international scientific networks; to improvements in technological capacity and investments; to improvements in an organisation's ability to attract researchers; and tangible results in terms of commercialisation of research outcomes and improved national and international competitiveness.

Marie Curie fellows benefited from working with leading overseas research groups and the extension of their international scientific networks, but also from access to major international research facilities. Ireland also had particular relative success in areas such as Marie Curie co-fund, participation by SMEs, leading of consortia and in certain areas of the framework programme such as ICT, Health and Research for the benefit of SMEs. The National Support Structure has played a highly important role in Ireland's overall success. Although causal impacts have been difficult to isolate, there are a number of strong indicators of impact, combined with survey and interview evidence, which suggests FP7 has been of benefit for Ireland and had significant impacts on developing the innovation base. Findings emerging from an ICT case study show that:

- Participation in the FP provides research organisations and large enterprises with knowledge and expertise that allows them to broaden up fields of activity and/or to develop new technologies, thus creating business opportunities.
- Research actors and SMEs in the field of ICT services that strive for a presence on the international market emphasise the opportunity the FP offers in developing an international brand, to be recognised for doing 'state-of-the-art' research and to set up relationships with potential customers outside of Ireland.
- For SMEs, a major benefit from FP participation is the development of relationships with customers and the development of client knowledge.
- Research organisations and SMEs that strongly depend on competitive funding for their sustainability indicate reputation building as a major benefit.
- Several of the ICT research centres that have knowledge transfer to local industry as part of their mission consider success in the FP critical to reaching their objectives.

Companies maintain that participation in FP7 has had an impact on their levels of turnover, employment, and productivity. It implies that the positive benefits outlined above (access to international networks and knowledge, increased research and technological capacity, ability to attract and retain research staff, etc.) have materialised in commercial gains.

3. Interim evaluation of Ireland’s Participation in Horizon 2020

3.1 Horizon 2020

With a budget of just under €80 billion and covering the period 2014 to 2020, Horizon 2020 is the European Union’s largest ever research and innovation programme. Horizon 2020 is the centrepiece of the Innovation Union, one of the seven Flagship Initiatives identified in the Europe 2020 strategy, which is expected to help Europe recover from the worst economic crisis of the post war period.

Table 6 Horizon 2020 Structure and Budgets

Theme	€m	% total
Excellent science (Pillar 1) Including European Research Council; Future and Emerging Technologies; Marie Skłodowska-Curie Actions; European research infrastructures	24,441	32
Industrial Leadership (Pillar 2) Including enabling and industrial technologies; access to risk finance; innovation in SMEs	17,016	22
Societal challenges (Pillar 3) Including health, demographic change and wellbeing; food security; secure clean and efficient energy; smart, green and integrated transport; climate action, environment resource efficiency and raw materials; inclusive, innovative and reflective societies; secure societies	29,697	39
Science with and for society	462	1
Spreading excellence and widening participation	816	1
European Institute of Innovation and Technology	2,711	4
Non-nuclear direct actions of the JRC	1,903	2
Total	77,028	100

Source: http://ec.europa.eu/research/horizon2020/pdf/press/fact_sheet_on_horizon2020_budget.pdf

Horizon 2020 is structured around three main pillars (above). It carries forward almost all elements of FP7, but also includes what was previously the separate Competitiveness and Innovation Programme and also the European Institute of Innovation and Technology (EIT). In short, it brings together all of

the previous EU funding instruments for research and innovation within a single, integrated framework.⁸

It has also introduced a series of new or improved funding instruments, including the SME Instrument, Access to Risk Finance and novel public procurement methodologies. The programme has expanded the use of co-funding (first used in FP7), which allows EU funds to be granted to national funders to strengthen the international engagement of what are essentially national schemes.

Additionally, the European Commission has maintained its support for an increasing number of strategic initiatives at the European level, which are important to understand under Horizon 2020 and engage with, both from the point of view of influencing research agendas (setting priorities) and securing major contracts. These can be grouped into two categories:

- I. innovation-related initiatives such as the European Technology Platforms (ETPs: industry-led networks that define strategic research agendas and outline roadmaps) or the European Innovation Partnerships (Public-Private Partnerships that work across the research and innovation spectrum and address / work on major societal challenges), and
- II. the Public-Public Partnerships, i.e. initiatives coordinating national policy makers such as the Joint Programming Initiatives and ERA-NETs.

3.2 Ireland's Targets and Strategy

In December 2013, the Government approved a national strategy for participation in Horizon 2020 together with an ambitious target of securing €1.25 billion in funding to Ireland over the lifetime of the Programme (2014-2020). The strategy sets out a range of actions designed to maximise Ireland's participation in the programme and achieve the target, involving all of the key Departments, agencies and research performers.⁹ A Horizon 2020 High Level Group (HLG) under the chairmanship of the Department of Jobs, Enterprise and Innovation (DJEI) was established to oversee the implementation of the national strategy for engagement with Horizon 2020.

Under the auspices of the HLG, a Strategic Research Proposals Group has been established to target and catalyse projects of larger scale. Continuing from FP7, there is a national support network, led and coordinated by Enterprise Ireland, comprising knowledgeable and experienced practitioners who are charged with helping companies and academics access the funding opportunities presented by Horizon 2020. Underpinning the overall drawdown target of €1.25 bn is a set of objectives specific to the different pillars of Horizon 2020.

Excellent Science was given a special focus in Ireland's Horizon 2020 strategy, including a new, multi-agency responsibility. This has meant that a number of support agencies, including SFI and IRC, have been given specific responsibilities and roles for delivering the objectives and targets under this pillar including building on success under Marie Curie Actions in FP7 and to address underperformance in ERC grants..

⁸ <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

⁹ <https://www.djei.ie/en/Publications/Publication-files/Horizon-2020-%E2%80%93-EU-Framework-Programme-for-Research-and-Innovation-2014-%E2%80%93-2020-Ireland%E2%80%99s-Strategy-and-Target-for-Participation-.pdf>

The **Industrial Leadership** pillar represents a key opportunity to further the involvement of Ireland's lead industries and SMEs, and to foster involvement in more Public-Private Partnerships. The objectives include encouraging lead industries to take advantage of the focus on Key Enabling Technologies and building on the success of SME engagement under FP7.

The seven **Societal Challenges**, for which multiple agencies have a shared responsibility, are presented as an opportunity to foster greater multidisciplinary working, and with Ireland's strengths in ICT, software, agri-food and other technology-based areas such as nanotech and eco-innovation, Ireland is in a strong position to take advantage of the opportunities this pillar presents. Key objectives include supporting businesses to bring to the market eco-friendly solutions and building on strong performance in science and society.

Within the **cross-cutting areas** of Horizon 2020, the Arts, Humanities and Social Sciences (AHSS) community receives support from the Irish Research Council, including support for AHSS researchers to lead projects in all areas, as well as grants to engage in interdisciplinary projects.

An opportunity is also set out for Ireland's research funding bodies to top up their own funding schemes via the Horizon 2020 **co-fund system**. This is currently being undertaken by a number of agencies, including Enterprise Ireland, Irish Research Council, SFI and others.

SMEs feature prominently in the strategy, with many concrete opportunities identified through a number of the pillars and specific societal challenges, with specific resourcing put in place to foster further SME engagement.

Target Setting

With regard to target setting, a bottom up exercise resulted in an indicative drawdown target of €1.01bn from Horizon 2020. Reflecting ambition of even stronger participation, the official target was set at €1.25 bn, equivalent to doubling the country's FP7 drawdown. The table below shows the indicative Horizon 2020 targets across pillars. It also provides a comparison with FP7 drawdown across areas. This is based on an approximation in terms of comparable programmes across both frameworks. The table reflects the results of Ireland's bottom-up exercise, which resulted in the indicative of €1.01bn. The allocation of the remaining €250m is dealt within under the recommendations.

The Table below shows that there are some areas where the targets far exceed the overall expectations of 100% in FP7 drawdown. This includes Marie Skłodowska Curie, Inclusive Societies, Secure, Clean, efficient energy and Smart, Green & Integrated Transport.

In contrast, there are other areas where Ireland could consider pressing harder as expectations are relatively conservative (highlighted in green).









Table 7– Horizon 2020 targets and comparison with FP7

Areas	Budget * €000	Budget %	Ireland's juste retour** €000	Ireland's bottom up*** €000 target	Ireland's Horizon 2020 target as %	FP7 drawdown €000	Horizon 2020 target as % increase of FP7 drawdown
I Excellent Science	24,441,073	31.73	293,293	401,000			
European Research Council	13,094,807	17	157,138	100,000	10%	50,467	98%
Future & Emerging Technologies	2,695,990	3.5	32,352	25,000	2%	--	
Marie Curie Actions on skills, training & career development	6,162,262	8	73,947	246,000	24%	112,713	118%
Research Infrastructures (inc. e-Infra.)	2,488,013	3.23	29,856	30,000	3%	15,680	91%
II Industrial Leadership	17,015,547	22.09	204,187	254,000			
Leadership in enabling & industrial technologies	13,556,977	17.6	162,684	198,000	20%	184,540	7%
Access to Risk Finance	2,842,343	3.69	34,108		--	--	
Innovation in SMEs	616,226	0.8	7,395	56,000	6%	35,656	57%
III Societal Challenges	29,678,996	38.53	356,148	331,000			
Health, demographic change & well-being	7,471,743	9.7	89,661	72,000	7%	77,960	-8%
Food security; sustainable agriculture; marine and maritime research; and the bio-economy	3,851,414	5	46,217	76,000	8%	40,869	86%
Secure, clean, efficient Energy	5,931,177	7.7	71,174	65,000	6%	19,842	228%
Smart, green & integrated Transport	6,339,427	8.23	76,073	44,000	4%	16,063	174%
Climate action, resource efficiency & raw materials	3,081,131	4	36,974	33,000	3%	18,210	81%
Inclusive Societies	1,309,481	1.7	15,714	21,000	2%	5,641	272%
Secure Societies	1,694,622	2.2	20,335	20,000	2%	28,015	-29%
IV Widening participation	816,500	1.06	9,798	10,000	1%	--	
V Science for and with society	462,170	0.6	5,546	6,000	1%	8,239	-27%
European Institute for Innovation & Technology	2,711,395	3.52	32,537	8,000	1%	--	
JRC Non-nuclear direct actions	1,902,598	2.47	N/A	N/A	--	382	
Total	77,028,279*	100	901,508	1,010,000	100%		

*Effective Horizon 2020 budget 2014-20 (current prices) €m. ** Juste Retour is defined as the 'principle that the funding granted to project participants from a given country/region under a joint call is in proportion to the budget contributed to the joint call by that country/region' (see: <https://www.era-learn.eu/service/glossary/juste-retour>). ***Compiled from National Support Network for Horizon 2020

3.3 Ireland's participation in Horizon 2020 to date

Table 8: Summary of participation

Summary of high points		Summary areas where further work will pay dividends going forward	
	Ireland has performed strongly within Horizon 2020, more than doubling its drawdown as compared with the first two years of FP7, up from €120M to €273M The number of applications has seen a similar expansion, and that has been especially strong growth in applications from business		The great success with the ERC has mostly concerned the starting and consolidator grants, and there is an opportunity for Ireland to do more to secure its share of the larger and arguably more prestigious ERC Advanced Grants
	The further expansion and development of Ireland's national support system – NCPs, Research Officers, Horizon 2020 funds – has played an important role in these achievements. There is a clear positive correlation between engagement with the support system and applicant success; there is also strongly positive feedback from users regarding the relevance and effectiveness of the supports on offer		Ireland is widely engaged with the Framework Programme. However, the proliferation of new advisory structures and strategic initiatives means that Ireland – and other smaller member states – needs to adopt a more coordinated approach to ensure its engagement is strategically targeted and maximises future opportunities.
	Assuming Ireland can maintain its success rates, the country is on track to exceed its €1.25 billion target and more than double its drawdown as compared with FP7		There is potential for additional focus of the national support network in areas of strategic importance including co-funding initiatives, the European Institute of Technology, procurement and access to finance.
	Ireland has been particularly successful within the Excellent Science pillar, further improving on its historically strong performance in Marie Curie and delivering a striking improvement within the ERC, as compared with FP7.		
	Ireland's smaller businesses have continued to show a strong interest in the programme, with Ireland's SMEs securing more than double the share of total EU contributions from the SME Instrument, as compared with the country's share of EU contributions for Horizon 2020 overall		

Participation and Progress

Up to March 2016 of Horizon 2020, Ireland submitted around 4,200 applications, which is **substantial increase** when compared with the first two years of FP7 (+2,300; +183%). This is higher than the increase for the EU programme overall, for which the equivalent increase is 133%.

Ireland is also submitting **larger applications**, as compared with FP7. In the first two years of Horizon 2020, Irish applicants requested €2.6 billion in EC contributions, as compared with €850M in total requested EC funding for all applications submitted in the first two years of FP7 (a threefold increase in the amounts requested).

Ireland secured 622 awards in the first two years of Horizon 2020 (447 in FP7), which amounts to an **application success rate of around 15%**. This is a decrease of around 5 percentage points as compared with FP7, which mirrors the trend for the programme overall, and reflects growth in application numbers across Europe. Ireland has performed relatively better than at EU level overall, where the average success rate has fallen by more than 8 percentage points in the first two years of Horizon compared to FP7.

Ireland has been **awarded a total of €273.3M in EC contributions** for those 622 participations and 472 projects (several projects have two or more participants by organisations located in Ireland). This is a 228% increase on the draw down in the first two years of FP7 (€120M), which is a notable improvement in performance. Ireland has achieved a success rate – in terms of EC Contributions – of around 11%, which is the same as the average for Horizon 2020 overall and 2% less than achieved in

FP7. This ratio is expected to improve slightly when the Commission has completed its contracting for decisions made relating to 2014 and 2015.

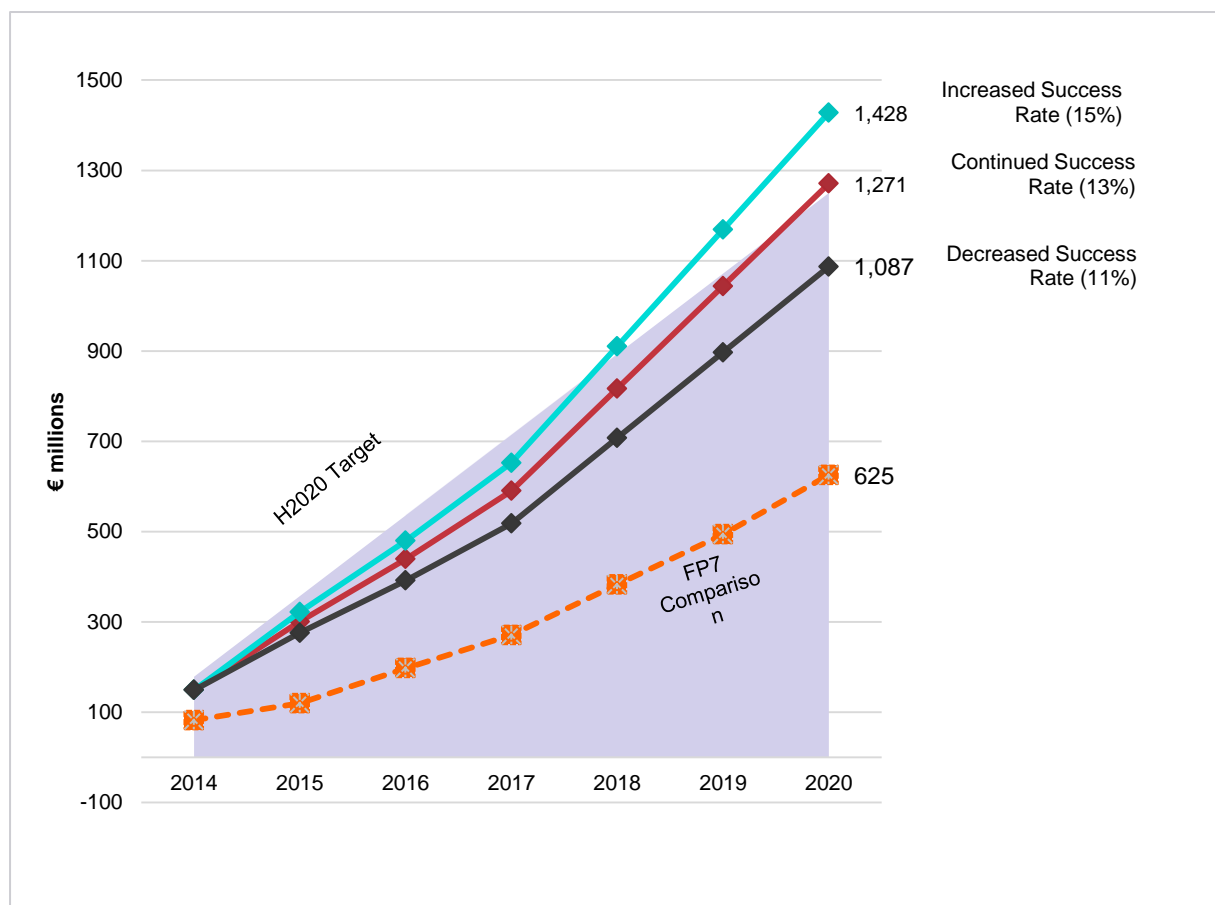
Higher Education Institutions (HEIs) submitted 2,283 applications with 321 successes (14.1% at €168.M). Driven by SMEs, business demand has been high, with 1,497 applications resulting in 214 successes (14.3% at €81.9M). Company funding accounts for 30% of drawdown for the period. Intel Ireland is listed in the Top 50 Horizon 2020 Companies.

Ireland is the top country in terms of the SME Instrument success rate (14%, based on applications), followed by Sweden (12%) and Estonia (12%). It is estimated that Enterprise Ireland and IDA client companies account for 85% of company funding in the period (EI 61% and IDA 24%).

Ireland's **performance has largely matched the performance of four comparator EU member states** (Austria, Denmark, Finland and the Netherlands) proportionately, in terms of both application numbers and success rates. The main exception is the Netherlands, which has performed better than Ireland (and the other comparators) in terms of both application success rates and funding rates.

Ireland is on target to achieve its overall drawdown target of €1.25bn, assuming it can maintain or improve upon the 13% (drawdown) success rate achieved in the first 12 months of 2014 and the Commission invests 100% of the planned budget. The numbers are finely balanced: a fall in either the success rate or Horizon 2020 expenditure would lead to Ireland missing its target, and underlines the need to continue to work hard to ensure it meets that target (see figure below).

Figure 3 - Scenario analysis: cumulative drawdown



Source: Technopolis (2016). Based on CORDA data (March, 2016).

3.4 Performance within specific pillars

Ireland has performed well in all three Horizon 2020 pillars, albeit it has been a little more active in the “Excellent Science” (164 projects, €102.7M) and “Societal Challenges” pillars (177 projects, €95.7M) compared to the Industrial Leadership pillar (117 projects, €70.7M,).

Table 9 – Overview, per pillar

Pillar	Number of projects with Irish participation	Total EC drawdown(Irish participants) (in € M)	Average EC drawdown per project (in € M)	Number of Irish participations	Average participation per project
Excellent Science	164	102.7	0.6	191	1.2
Industrial Leadership	117	70.7	0.6	161	1.4
Societal Challenges	177	95.7	0.5	255	1.4
Spreading excellence and widening participation	3	0.8	0.3	3	1.0
Science with and for Society	8	2.3	0.3	9	1.1
Euratom	3	1.1	0.4	3	1.0
Total	472	273.3	0.6	622	1.3

Source: Technopolis (2016). Based on CORDA data (March, 2016).

Ireland has secured more than €20M in five specific programmes, with the Marie Skłodowska-Curie actions (MSCA) (€54M) programme having achieved the greatest volume of contributions. It has achieved 40% or higher of its 7 year targets for four specific programmes: secure societies, health, Leadership in Enabling Technologies and the European Research Council, which is substantially ahead of where the country might have expected to be after two years of the 7-year term (28% of elapsed time).

Table 10 – EC drawdown per specific programme

Rank	Specific programme	Total EC drawdown (in € M)	Percentage of EC drawdown	Target (in € M)	Percentage of target (in € M)
1	Marie Skłodowska-Curie actions	54.1	20%	246.0	22%
2	Leadership in Enabling Industrial technologies (Information and Communication Technologies, plus Advanced Manufacturing and Processing)	52.2	19%	132.0	40%
3	European Research Council	39.7	15%	100.0	40%
4	Health, demographic change and wellbeing	31.0	11%	72.0	43%
5	Secure, clean and efficient energy	20.4	7%	65.0	31%
6	Food security, sustainable agriculture	19.1	7%	76.0	25%
7	Secure societies - Protecting freedom and security of Europe and its citizens	9.6	4%	20.0	48%
8	Nanotechnologies, Advanced Materials and Production	9.1	3%	66.0	14%
9	Climate action, environment, resource efficient	8.4	3%	33.0	25%
10	Other	29.7	11%		
	Total	273.3	100%	1250.0	22%

Source: Technopolis (2016). Based on CORDA data (March, 2016)

SME Instrument

Ireland has experienced a high success rate in the SME Instrument, which operates across Leadership in Enabling and Industrial Technologies (LEIT) and the societal challenges pillar. In fact, Ireland's success rate has been higher than the overall EU average (14% versus 7%). Irish SMEs have so far drawdown 5% of the total EC Contribution, which is far larger than the average drawdown for Ireland across all programmes (1.9% of total budget). The SME Instrument has also attracted new players: of the 45 Ireland-based SMEs that have won awards, 32 are new to the programme.

Applicant Views on Horizon 2020 – interviewed/surveyed as part of the evaluation

Applicants welcomed the programme's commitment to simplification and the introduction of a single financial model. The enthusiasm for Horizon's various other changes varies by segment, with for example a more positive response on average amongst academics as compared with companies for the increased focus on societal challenges and the greater opportunities for co-funding. Companies by contrast were more favourably disposed to the addition of new instruments (e.g. access to finance) or the expansion of support for public private partnerships.

In the first two years of Horizon 2020, 565 Irish organisations that did not apply in FP7, applied to the programme. This means that **68% of all Irish organisations that have applied so far could be new players** (though it is not clear whether they applied to FP6 or earlier programmes). This represents 24% of total applications to Horizon 2020, and 24% of total requested EC contributions in the first two years. Notably, 87% of these 'new players' are companies.

Applicants continue to find the programme challenging, however, due to factors such as cost, complexity of bidding and the lower success rates.

The three evaluation **criteria that applicants find most challenging** relate to demonstrating impacts and dissemination. The more operational criteria such as resourcing and management were found to be challenging by about 1/3 of respondents. Higher education institutions (HEIs) and research organisations are slightly more likely to find the application criteria straightforward than companies or other organisations.

3.5 Horizon 2020 national support system

Ireland's national support system has been expanded and developed over the course of several Framework Programmes and arrived at a point where it has a clear governance structure that involves most if not all of the key actors nationally, a good complement of National Contact Points (NCPs) and a suite of well-regarded financial support measures.

The evaluation survey reveals that a majority of Horizon 2020 applicants who responded (both successful and unsuccessful) interacted with an NCP during the application process. Of the NCP core services, **information about calls, and advice on calls and administrative procedures were the most frequently used.**

On average, **successful applicants tend to make more use of the various NCP services** than unsuccessful applicants do. In particular, successful applicants make extensive use of targeted information services and advice on proposal writing.

While there is little change in the overall percentage of applicants reporting interaction with NCPs between FP7 and Horizon 2020, survey analysis highlights **several services that are being used more widely.** These are typically the higher-value functions, including brokering events and assistance with partner searches. There is also a switch away from using the more generic services, including the web portal and circulars.

Appropriateness and effectiveness of Ireland's national support for Horizon 2020

A majority of survey respondents report that their interaction with the NCP network has helped them to:

- I. improve their understanding of critical success factors (66%)
- II. understand which calls to target (59%), and
- III. identify a specific opportunity relevant to their organisation (58%).

More than a third of respondents agreed that **interaction with the NCP network had improved the implementation (38%) and impact (37%) aspects of their bid**, while a notable minority (28%) agreed that it had improved the scientific or technical aspects of their bid.

A comparative analysis between FP7 and Horizon 2020 reveals an **increase in positive views of benefits related to the different NCP functions**, including alerts to specific opportunities, understanding what calls to target and improving implementation aspects.

Adequacy of resourcing of Ireland's national support for Horizon 2020

Ireland's 23 NCPs (in FTE terms) **equates to around 2 NCPs for every thousand researchers, which is in line with the average for the EU28.**

Consultation in the evaluation found there was **widespread satisfaction with resourcing levels across most stakeholder groups**, although a minority suggested that more 'on the ground' support from NCPs in high-pressure areas would be welcome.

There was general **satisfaction with the wide-range of financial support measures** that are available. There were no suggestions that any specific measure was underperforming or should be changed drastically or replaced. Several contributors suggested that the network of National Delegates could be utilised better in terms of representation and cross-working.

Influencing the European research agenda

Ireland is **well represented on key European groups**, including seven of 10 Joint Programming Initiatives and 23 of 41 European Technology Platforms (with greatest coverage in ICT topics). For completeness, the evaluation also reviewed membership of the Horizon 2020 Advisory Groups (of which Ireland is a member of 14 of 19) and the number of registered expert evaluators. Ireland has 255 registered expert evaluators in the Commission's database, and this is proportionally in line with the overall database in terms of pillars and programmes.

Feedback from consultations suggests that **despite this good coverage, more could be done to maximize Ireland's participation** in these groups, in particular in terms of presence and ensuring that appropriately senior individuals can attend more consistently.

Approaches to co-funding

Ireland has taken advantage of the Commission's increased commitment to Co-funding under Horizon 2020, and has secured a **significant number of MSCA COFUND awards in the first two years.** The instrument has attracted strong interest among both research funders and individual institutions. This European investment in national programmes is expected to allow Ireland to expand its capacity for researcher training and career development, which should help to improve Ireland's prospects in future ERC calls.

Ireland has been **widely involved with ERA-NETs from the outset**, and since FP6 has been involved in 92 networks, co-ordinating two. In total, 26 Irish organisations have been involved across 57 joint calls. Consultation revealed that there are many agencies – and some departments – that would wish to engage in ERA-NETs, but cannot do so due to capacity constraints and resourcing issues.

Stakeholder consultation suggests that **the current approach could benefit from more strategic co-ordination** in terms of which ERA-NETs are targeted and by whom, and a greater 'central push' could lead to enhanced opportunities.

4. Future participation and Recommendations

4.1 Targeting greater participation around national priorities

The programme-level drawdown targets are based on a bottom-up assessment of Ireland's national strengths and capacities, as well as past performance in FP7, and an earlier overall target of €1 billion. The individual targets were not updated, when the final overarching target was set at €1.25 billion, and it would be helpful if this could be done now.

Technopolis suggest there are several areas of national strength where Ireland could look to target greater participation in Horizon 2020. The methodology compared a juste retour figure for each specific programme with Ireland's current target and its actual performance in FP7 and Horizon 2020 (See Appendix II for detailed analysis). A less mechanistic approach may be desirable. However, the analysis suggests Ireland could increase its targets in several specific programmes, including Future and Emerging Technologies, Industrial Technology (LEIT), Health and the European Institute for Innovation and Technology (EIT). The strong early performance in the ERC suggests it may be possible to further stretch that particular target, perhaps focusing additional attention on the larger and more prestigious ERC Advanced Grants.

4.2 Strengthening national support around STI priorities

A review of the distribution of Ireland's NCPs across the Horizon 2020 pillars reveals a conscious decision to invest more heavily in some areas as compared with others, including LEIT (4 NCPs), agri-food (2 NCPs), SMEs (2 NCPs) and climate (2 NCPs). The outlier in this analysis is Marie Curie, which has one NCP and a target of close to €250M, and yet is a priority area within the overall strategy. This may be a sensible level of resourcing, however, given the high level of interest among universities and colleges, whose research offices and senior academics work closely with the IUA and the Marie Curie NCP to promote opportunities in this space.

It is conceivable that an updated Horizon 2020 strategy would further concentrate the network on those larger programmes that intersect best with Ireland's national priorities, and leave the smaller programmes to be covered indirectly by all NCPs. The absence of any specific nominated NCP support for the substantial opportunities coming through the European Institute for Innovation and Technology (EIT) calls may also be a point for further discussion. There could be a similar discussion about the programme's support for several new types of instrument, including innovative procurement and access to finance and if these are dealt with most effectively through targeted support (e.g. a named NCP) or transversally.

Analysis of the distribution of NCPs suggests there may be another gap, which relates to the increasingly important portfolio of Commission co-funding and strategic initiatives. These initiatives attract substantial EU funding, influence policy and work programmes and can deliver substantial social and economic value and have increased in prominence. Ireland's national priorities intersect with many of these platforms, and the evaluators suggest there would appear to be a prima facie case for having an NCP resource, and possibly a support fund, earmarked for such co-funding and strategic initiatives.

Ireland's overall national RDI support system includes various financial supports that complement the work of the NCP network (and research officers within individual universities, colleges and institutes) that have helped to increase application numbers in general and project coordinators in particular.

Ireland created several new financial support measures for Horizon 2020, targeting different aspects of the ERC (pre and post decision), which have helped Ireland to perform strongly and turn round its limited success within the Ideas Programme under FP7.

The evaluators suggest that the success of recent developments in the national support system raises the potential for a further expansion of the network and related financial supports to deliver increased participation in areas where there has been limited assistance historically.

4.3 Strategic engagement

The evaluators suggest that there are several ways in which Ireland can become *more* strategic in its engagement with Horizon 2020, and particularly with regard to capitalising on the potential synergies that exist between national interests and those of the Horizon 2020 programme.

Ireland has a good national strategy for Horizon 2020. However, that strategy is not complemented by separate underpinning strategies for the various key actors involved with the programme according to the evaluators. The creation of specific strategies would, they argue, help to focus attention on priorities and this greater openness and transparency would also facilitate coordination among the members of the support system.

The evaluation finds that the current strategy also focuses on the financial drawdown, and has less to say – at least in a way that is specific or measurable – about the other potentially important objectives, such as expanding and improving the level of support available nationally for the development of researcher skills and careers or the strengthening of the global competitiveness of Ireland’s key industries. Broadening this presentation of those objectives would underline the strategic potential of Horizon 2020 to more actors, in policy and industry circles.

4.4 Synergies

One of the evaluations findings is that there are numerous evident synergies between national and European interests, and Ireland is already active in this space. The substantial interest in the MCSA COFUND is a good example of Ireland’s research community identifying an opportunity to inject additional funds and a transnational dimension into its research fellowship programmes. There continues to be strong interest in the Horizon 2020 ERA-NET instrument too, albeit tight finances nationally are a challenge, and have reduced engagement as compared with FP7. Ireland has also sought to improve its engagement with various European technology and innovation platforms and JTIs, as a means by which to influence the EU’s strategic research agendas and support businesses in their market surveillance and partnership building. The SFI Centres have a clear and strong focus on Horizon 2020, as a potential source of income and strategic advantage more generally, for both academics and Ireland’s tech firms.

The evaluation finds that there remains substantial potential for increasing synergies in newer parts of the programme (e.g. Access to Finance, EIT), and some further elaboration of those opportunities would be helpful. In a similar vein, the Commission sees synergies between Horizon 2020 and the European Structural and Investment Funds (ESIF), and Ireland could benefit from closer consideration by the key actors involved.

4.5 Maximising success in calls for proposals

The evaluation review of selected other EU member states' Horizon 2020 strategies makes clear that most countries have set substantially higher targets for their national drawdown from Horizon 2020, as compared with FP7. Given this situation, the success rates seen in the first calls of Horizon 2020 are unlikely to have been unique to Ireland.

However, Ireland recorded a less dramatic reversal in success rates across all member states. This may reflect the investment in the support system and the growing experience of Ireland's research base. Ireland has expanded its NCP team and introduced several new measures with the explicit aim of improving its success rates in the move from FP7 to Horizon 2020 in key areas, and especially around the ERC.

Given the likelihood of Horizon 2020 continuing to see lower national success rates for the programme overall, the evaluations suggest it makes sense for Ireland to continue to look at ways in which it can maximise applicants' chances of success, to help ensure risk and reward remain in balance and to help achieve its drawdown target. There are essentially two options: the first is to increase the support system's ability to reach more of the total population of prospective applicants. The second approach is to improve the effectiveness of the support available, whether that is tactical refinements to the advice or the creation of new services.

Firstly, there remain substantial numbers of applicants that choose not to use the support available, for whatever reason, and their success rates are markedly worse on average than those for applicants that have sought advice from the national support system. This positive association is borne out in other countries and regions too. It suggests there may be value in increasing further the level of marketing and communications, with a particular emphasis on codifying critical success factors (to improve success rates) and to showcase the benefits of participation (to expand the pool of applicants and applications).

Turning to the second development option, feedback from interviews and surveys produced a number of suggestions for new services, which Ireland could implement in order to increase the average success rates within the Horizon 2020 application process, from more funding for travel to the creation of dedicated funds for businesses or enhanced visibility of supports provided through the Agencies.

4.6 Increasing the scale of Ireland's participations in the framework programme

The evaluation finds evidence of movement in this direction already. In the move from FP7 to Horizon 2020, Ireland has recorded a substantial increase in the average size of its applications as well as an increase in the average size of its successful participations. There has also been an increase in the proportion of all applications and participations where Ireland hosts the project coordinator.

There are basically two routes through which one can increase the average scale of participations, with the first being about taking a more central role within project consortia, including taking on the role of project coordinator. The second is to pursue an involvement with larger, more strategic projects. This second tactic does not automatically produce larger individual grants, as mega projects may have far more partners and work packages that look similar to those of smaller projects. There is however a greater opportunity for any one country to secure multiple participations within those larger strategic initiatives, thereby increasing the overall total. The Research and Technology Centres could have an

especially important role to play here, with both the capacity to lead big consortia and a central position within the innovation landscape that would allow them to bring into those consortia multiple other Irish actors, from MNCs to indigenous SMEs, through to government-based user organisations.

There are relatively few ultra large projects, and that those that do arise will often have a strong commitment to support a pre-existing partnership. The evaluations suggest that Ireland may need to be more proactive in its participation in various Advisory Groups and ETPs, in order to help encourage the Commission to fund more mega projects and crucially to be in the room when the strategic alliances are being forged.

One of the best ways to increase the numbers of project coordinators is to track participants over time with a view to encouraging people to increase their ambition level with each successive bid, progressing from minor to major partner all the way through to coordinator. There may also be an argument for providing some level of financial support to coordinators over the life of their project, as is done already for the ERC. A small, cost-shared fund for administrative support would help to overcome headcount constraints, and may encourage more of Ireland's leading scientists to push for the role of project coordinator.

4.7 Recommendations

As a result of the analysis and consultation with the study Steering Group, Technopolis has formulated 20 recommendations against six categories:

- Targeting greater participation around national priorities (1-2);
- Strengthening the national support system around STI priorities (3-6);
- Strategic engagement (7-9);
- Synergies (10-12);
- Maximising success in calls for proposals (13-17); and
- Increasing the scale of Ireland's participations in the framework programme (18-20).

A lead agency and timeline is also indicated. HLG refers to the High Level Group chaired by DJEI whose core role is to oversee development and implementation of Horizon 2020 strategy.

The recommendations are not prescriptive and their merits, timing, resource implications and practicalities will need to be considered by DJEI, the High Level Group and other relevant stakeholders.

Overall, it is important to note that the recommendations are about building on what is primarily an effective system of support and good performance rather than a wholesale change to the existing approach.

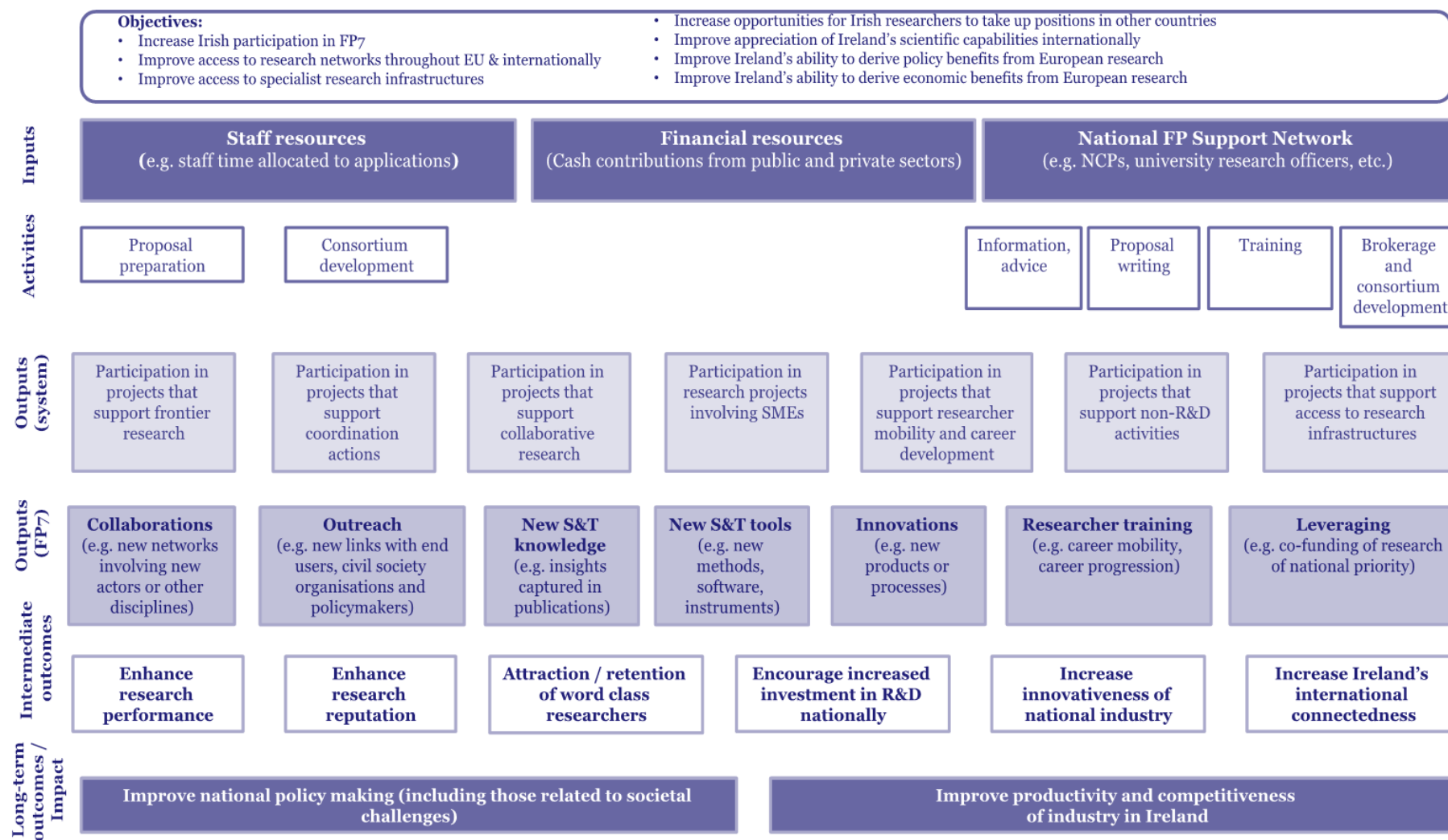
Figure 11 - Recommendations for future FP participation

	Recommendation	Description	Lead responsibility	Timeline
Targeting greater participation around national priorities				
1	Update programme-specific targets, to reach €1.25 billion overarching target	Review current targets and the extent to which they need to be held where they are or may be expanded, to reflect the overall ambition of reaching €1.25 billion	DJEI, National Director and Support Structure	Summer 2016
2	Create an addendum for current Horizon 2020 strategy	Publish the revised targets, along with accompanying argumentation	HLG	Summer 2016
Strengthening the National Support System				
3	Ensure national support network has capacity to support Ireland's ambitions in strategic initiatives	Review and possibly expand the capacity of network to ensure there is active promotion and coordination of Ireland's engagement with the growing number of Strategic Initiatives (e.g. ERA-NETs, ETPs, JTIs, PCPs)	National Director and Support Structure	By end 2016
4	Consider the merits of creating a support package for the EIT	Carry out an impact assessment (business case) to determine whether a national support package would enable Ireland to increase its engagement with the EIT and its strategic participation therein	National Director and Enterprise Ireland	By early 2017
5	Review the capacity of Research and Technology Centres to deliver on their Horizon 2020 targets	Review the extent to which extra support capacity within Ireland's Research and Technology Centres might increase the likelihood that the centres will meet or exceed their targets (and bring in enterprise partners)	Science Foundation Ireland, Enterprise Ireland	Summer 2016
6	Consider creating a Horizon 2020 fund to support businesses	Consider creating a dedicated fund for business, designed to expand the pool of businesses engaging with Horizon 2020 and increase private investment in R&D	National Director and Enterprise Ireland	By autumn 2016
Strategic Engagement				
7	Create a catalogue of key actors and their interests in Horizon 2020	Add annexes to Horizon 2020 Strategy with a mapping of actors, strategic initiatives and national capacities	HLG	By end 2016

	Recommendation	Description	Lead responsibility	Timeline
8	Develop department-level Horizon 2020 strategies and rolling annual action plans	Develop departmental and agency level strategies, which connect Horizon 2020 to agency mandate and also dovetail with overarching national Horizon 2020 strategy	All HLG members	By end 2016
9	Develop a Logic Model with KPIs to underpin the H2020 strategy	Develop a Logic Model to underpin the national H2020 strategy, which details the link between country's scientific, social and economic objectives for the programme and the various advisory and financial inputs and related KPIs	HLG	By end 2016
Synergies				
10	Create a forum for debating new ideas for strengthening future participation	Consider whether and how it might create a forum for people to propose and debate new ideas for strengthening Ireland's performance in Horizon 2020.	HLG, National Director and Support Structure	By autumn 2016
11	Map points of intersection between Horizon 2020 and ESIF	Identify areas of common interest between Horizon 2020 and Ireland's ESIF strategy and investments	DJEI	By autumn 2016
12	Promote awareness of the PCP / PPI instruments	Increase awareness of Horizon 2020's procurement instruments, exploring the potential for a link between Ireland's Small Business Innovation Research (SBIR) scheme and the analogous instrument within Horizon 2020	HLG and Enterprise Ireland	Summer 2016
Maximising success in calls for proposals				
13	Coordinate involvement in Advisory Groups and ETPs, nationally	Take a more coordinated approach to Ireland's involvement in various Advisory Groups and ETPs in order to strengthen Ireland's influence on programme's research priorities and work programmes	National Director and Support Structure	By autumn 2016
14	Intensify marketing and communication	Expand numbers of information days and awareness raising events with a view to expanding the pool of potential applicants	National Director and Support Structure	From summer 2016
15	Set up a national network of	Create a more extensive network of people	National Director	By early

	Recommendation	Description	Lead responsibility	Timeline
	Horizon 2020 mentors	and mentors with knowledge of the programme	and Support Structure	2017
16	Develop additional guidance material	Create additional guidance material for applicants	National Director and Support Structure	From summer 2016
17	Monitor the Commission's piloting of its 'seal of excellence'	Monitor the Commission's 'seal of excellence' pilot to ensure Ireland can capitalise on any opportunities it may present	Enterprise Ireland	By early 2017
Increasing the scale of Ireland's participations in the framework programme				
18	Create a national fund for strategic and COFUND initiatives	Create a national fund (competitive) to help national agencies participate more fully in various strategic initiatives and co-funding projects (e.g. ERA-NETs)	National Director and Enterprise Ireland	By early 2017
19	Create an expanded fund for Coordinators	Extend the ERC overhead mechanism to project coordinators involved in any part of the programme	National Director and Enterprise Ireland	By early 2017
20	Create an alumni network for participants	Create an alumni network and platform to share experiences / material / advice that will allow Ireland to track careers and encourage progression to higher levels (e.g. coordinators)	National Director and Support Structure	By early 2017

Appendix I – Intervention Logic Model of Irish participation in FP7



Appendix II Technopolis analysis on targeting greater participation around national priorities

Analysis

Ireland's Horizon 2020 strategy is committed to improving national participation in the framework programme through building on national STI strengths and priorities, and includes drawdown targets for each of the programme's constituent elements. These are based on an assessment of Ireland's national strengths and capacities as well as past performance in FP7, and are presented in *Table 12*.¹⁰

Table 12 - Allocation of Ireland's H2020 target income, by pillar and specific programme

Areas	H2020 Budget	Ireland's juste retour	Ireland's Target	Target - JR
	€Ks	€Ks	€Ks	€Ks
I Excellent Science	24,441,073	293,293	401,000	107,707
European Research Council	13,094,807	157,138	100,000	-57,138
Future & Emerging Technologies	2,695,990	32,352	25,000	-7,352
Marie Curie Actions	6,162,262	73,947	246,000	172,053
Research Infrastructures	2,488,013	29,856	30,000	144
II Industrial Leadership	17,015,547	204,187	254,000	49,813
LEIT	13,556,977	162,684	198,000	35,316
Access to Risk Finance	2,842,343	34,108		
Innovation in SMEs	616,226	7,395	56,000	48,605
III Societal Challenges	29,678,996	356,148	331,000	-25,148
Health, demographic change etc.	7,471,743	89,661	72,000	-17,661
Food security; etc.	3,851,414	46,217	76,000	29,783
Secure, clean, efficient Energy	5,931,177	71,174	65,000	-6,174
Smart, green & integrated Transport	6,339,427	76,073	44,000	-32,073
Climate action, resource efficiency, etc.	3,081,131	36,974	33,000	-3,974
Inclusive Societies	1,309,481	15,714	21,000	5,286

¹⁰ The financial allocations shown in Table 12 are based on a bottom-up analysis carried out as part of the development of the Horizon 2020 strategy and amounts to an overall target of €1 billion or around €109M (+112%) more than Ireland's €900M Juste Retour figure and around 160% of the drawdown achieved in FP7. The final drawdown target for H2020 was set top down, at €1.25 billion, and around €350M (+140%) ahead of Ireland's Juste Retour based on the 1.2% contribution to the EU budget and more than double the drawdown achieved in FP7. The additional €250 million in the final target was not added in to the allocations of the individual areas targets across the pillars or individual programmes.

Areas	H2020 Budget	Ireland's juste retour	Ireland's Target	Target - JR
Secure Societies	1,694,622	20,335	20,000	-335
IV Widening participation	816,500	9,798	10,000	202
V Science for and with society	462,170	5,546	6,000	454
EIT	2,711,395	32,537	8,000	-24,537
JRC Non-nuclear direct actions	1,902,598	N/A	N/A	N/A
Total	77,028,279	901,508	1,010,000	108,492

Using Ireland's anticipated contribution (1.2%) to the EU budget 2014-2020 as the basis for estimating a 'juste retour' figure for each pillar and element within the programme, it can be seen that there are five areas where Ireland expects to perform substantially ahead of its 'fair' return and five where it is expected to fall short of that arithmetic threshold. The following bullet points list the marginal increment in EU drawdown and share of Juste Retour (JR) for each of the five H2020 areas above and below the threshold:

The five areas with targets set substantially ahead of Juste Retour (JR) are:

- MCSA (+€172M and 333% of its JR);
- Innovation in SMEs (+€49M and 757% of JR);
- Leadership in Emerging and Industrial Technologies (+€35M, 122% of JR);
- Food Security, etc. (+€30M, 164% of JR); and
- Inclusive Societies (+€5M, 134% of JR).

The five areas with targets set below Juste Retour (JR) are:

- ERC (-€57M and 64% of JR);
- Smart, Green and Integrated Transport (-€32M, 58% of JR);
- European Institute for Innovation and Technology (-€25M, 25% of JR);
- Health, Demographic Change and Wellbeing (-€18M, 80% of JR); and
- Future and Emerging Technologies (-€7M, 77% of JR).

In practice, the scale of the planned increase in drawdown from the €614M realised in FP7 to more than €1 billion in the original target for Horizon 2020, means the strategy foresees an increase in every programme area that can be reconciled with FP7, bar three (Health; Secure Societies; and Science for and with Society). Table 13 compares those H2020 targets with the FP7 drawdown, which presents a somewhat different picture, in terms of ambition levels, to the analysis of targets against Juste Retour. The ERC is the most obvious point of difference between the two perspectives, with the current target amounting to a doubling of the drawdown achieved within FP7 even though the H2020 target is still only around 64% of the arithmetic Juste Retour figure. MCSA remains the single most ambitious focal point, albeit building from a strong base (Ireland's FP7 drawdown for MCSA was already greater than

the calculated Juste Retour figure for H2020). The most ambitious targets proportionately relate to areas where Ireland had been less active previously, notably in the fields of energy and transport.

Taken together, these two analyses show Ireland has allocated its H2020 targets in line with several of its key strengths (e.g. innovative SMEs) and priorities (e.g. ERC).

Table 13 - Allocation of Ireland's H2020 target income by programme and in comparison with FP7 drawdown

Areas	H2020 Target	FP7 drawdown	Target – FP7	Target – H2020 versus FP7
	€Ks	€Ks	€Ks	% change
I Excellent Science	401,000	178,860	222,140	224%
European Research Council	100,000	50,467	49,533	198%
Future & Emerging Technologies	25,000	--	--	--
Marie Curie Actions	246,000	112,713	133,287	218%
Research Infrastructures	30,000	15,680	14,320	191%
II Industrial Leadership	254,000	220,196	33,804	115%
LEIT	198,000	184,540	13,460	107%
Access to Risk Finance	--	--	--	--
Innovation in SMEs	56,000	35,656	20,344	157%
III Societal Challenges	331,000	215,221	115,779	154%
Health, demographic change etc.	72,000	77,960	-5,960	92%
Food security; etc.	76,000	40,869	35,131	186%
Secure, clean, efficient Energy	65,000	19,842	45,158	328%
Smart, green & integrated Transport	44,000	16,063	27,937	274%
Climate action, resource efficiency, etc.	33,000	18,210	14,790	181%
Inclusive Societies	21,000	5,641	15,359	372%
Secure Societies	20,000	28,015	-8,015	71%
IV Widening participation	10,000	--	--	--
V Science for and with society	6,000	8,239	-2,239	73%
EIT	8,000	--	--	--
JRC Non-nuclear direct actions	--	382	--	--
Total	1,010,000	614,277	395,723	164%

Source: Technopolis

The rationale for each target is not expanded upon in the national strategy. It is understood the targets were set in discussion with the research base and reflect the community's views on the size of the research base and the extent to which its engagement with the FP might be expanded. They also reflect certain structural factors, they do not include a view of any competing priorities or alternative funding opportunities (e.g. agri-food businesses focusing on development opportunities financed through other national schemes or even national drawdown from other EU schemes, like CAP).

Our analysis suggests there are several areas of national strength where Ireland could look to target greater participation across the life of Horizon 2020. Our methodology (elaborated at some length in the next several paragraphs) compares a *Juste Retour* figure for each specific programme with Ireland's current target and its actual performance in FP7 and H2020. Ireland will want to employ a less mechanistic approach than we have had to use, however we trust our analysis will serve (i) to underline the need to think carefully about where to further increase targets and (ii) to inform debate with relevant stakeholders. We believe Ireland should be looking to increase its targets substantially in several specific programmes, including FET, Industrial Technology (LEIT), Health and the EIT. The strong early performance in the ERC suggests it may be possible to further stretch that particular target, although we note the current target is already quite ambitious and amounts to a doubling of the levels achieved within FP7. We have similarly suggested substantial increases in areas where that may be impractical (e.g. research infrastructure, access to finance) or even undesirable.

The evaluation team has a limited view of national capacities, however, the evaluation has done an analysis to compare the current targets with a list of revised targets based on a uniform application of 140% of *Juste Retour* to every H2020 pillar and programme area (see Table 13). The evaluation used a multiplier of 1.4 because Ireland's overall target of €1.25 billion amounts to around 140% of Ireland's overall *Juste Retour* of €0.9 billion, which is itself estimated based on Ireland's 1.2% contribution to the EU budget. The evaluation looked at each of the targets, from the national strategy and from our application of the 1.4JR, and compared them with the FP7 drawdown (where that exists). The evaluation then chose one or other of those two targets as our suggested new national target, attempting to take a view on which seems to be the best compromise between achieving the overall stretch (to €1.25 billion) and being a realistic challenge for the research base, given the performance under FP7. By way of example, the current H2020 strategy includes a target for the ERC of €100M, however, the 1.4JR target would be closer to €220M, which is substantially higher (+€110M). Increasing the ERC target to this new level would cover off almost 45% of the additional €250M. However, as the current target is already set at 200% of what was achieved in FP7, and given the challenging and highly competitive nature of this part of the programme, the evaluation team took the view that a revised target of €220M would not be feasible. Ireland has enjoyed substantial ERC success in the first two years, and contributors believe there is an opportunity to do more going forward, particularly on Advanced Grants, which receive higher levels of funding. Therefore, we suggest increasing the original target to €150M, which is in line with the JR figure.

Using the same logic, we suggested the LEIT target should be increased. The industrial technology programmes encompass areas of substantial national capability, in both science *and* innovation. The original LEIT target is similar to that for FP7 (107%), which given the 140% expansion in Horizon 2020 amounts to a reduction in the targeted share of income, in proportionate terms. The original target is around 124% of Ireland's *juste retour*, but we concluded it could be increased given the substantial existing capacity nationally and in particular the very substantial efforts of the Research and Technology Centres to mobilise national interests in these different arenas. The Horizon 2020 target for Health is around €6M lower than the drawdown achieved in FP7 (92%) and just 80% of the JR

figure. Transport is the other area where Ireland's H2020 target is substantially lower than its JR figure (58%), however, the new target is almost three times the drawdown achieved in FP7. The current target may already be at the limits of what Ireland might reasonably achieve in terms of expansion of engagement within the course of a single framework programme.

Table 14 - Ireland's H2020 income by programme, showing original and possible new targets

Areas	FP7 drawdown	Ireland's Target	New Target	Ireland's juste retour	1.4JR	Hold / Increase
	€Ks	€Ks	€Ks	€Ks	€Ks	
I Excellent Science	178,860	401,000	432,255	293,293	406,670	--
European Research Council	50,467	100,000	150,000	157,138	217,882	Increase
FET	--	25,000	44,858	32,352	44,858	Increase
Marie Curie Actions	112,713	246,000	246,000	73,947	102,532	Hold
Research Infrastructures	15,680	30,000	41,397	29,856	41,397	Increase
II Industrial Leadership	220,196	254,000	328,865	204,187	283,119	--
LEIT	184,540	198,000	225,572	162,684	225,572	Increase
Access to Risk Finance	--		47,293	34,108	47,293	Increase
Innovation in SMEs	35,656	56,000	56,000	7,395	10,254	Hold
III Societal Challenges	215,221	331,000	476,174	356,148	493,823	--
Health, ...	77,960	72,000	124,321	89,661	124,321	Increase
Food security, ...	40,869	76,000	76,000	46,217	64,083	Hold
Secure, clean, efficient Energy	19,842	65,000	65,000	71,174	98,687	Hold
Smart Transport	16,063	44,000	44,000	76,073	105,480	Hold
Climate action, ...	18,210	33,000	51,267	36,974	51,267	Increase
Inclusive Societies	5,641	21,000	21,000	15,714	21,788	Hold
Secure Societies	28,015	20,000	28,196	20,335	28,196	Increase
IV Widening participation	--	10,000	13,586	9,798	13,586	Increase
V Science for and with society	8,239	6,000	7,690	5,546	7,690	Increase
EIT	--	8,000	45,115	32,537	45,115	Increase
JRC Non-nuclear	382	N/A	--	N/A	--	--

Total	614277	1,010,000	1,247,139 ¹¹	901,508	1,250,000	--
-------	--------	-----------	-------------------------	---------	-----------	----

We ran through the entire list of programme areas, applying the same logic, and have suggested 11 areas where Ireland might consider increasing its target to the 1.4JR level and six where we judge the current target to be sufficient. This approach produced a revised overall target of €1.25 billion, with most of the additional income linked with Pillars II and III. The biggest increases, at the level of individual programmes, relate to Health, Access to Risk Finance and the EIT. The last two programme areas are challenging areas to grow, as they require substantial co-investment and high levels of industrial engagement, as compared with Pillar I.

The EIT is investing heavily supporting technology and innovation networks (KICs) in a range of areas of strategic importance for Ireland, from food to climate change and health. Ireland achieved limited engagement with the EIT KICs, prior to the launch of Horizon 2020 (Ireland was involved in two initiatives, the EIT Health KIC, which include the participation from Trinity College and IBM Ireland; and the EIT Raw Materials KIC). However, there are opportunities to increase national engagement with the EIT programme overall (and its €2.7 billion budget). The 2016 KIC calls for proposals (Food for the Future; Advanced Manufacturing) are both of great relevance to Ireland. Enterprise Ireland has piloted an EIT support scheme, which covered the cost for a year of a national 'champion' to bring together a strong consortium of industrial and academic interests with the capacity to secure one of the hubs within a successful KIC.

11 This total does not include our suggested target for Access to Risk Finance (ATRF) as these awards are loans and investments, rather than grants, so cannot strictly contribute to Ireland's total drawdown figure. We understand that organisations based in Ireland have secured more than €60M in ATRF funding in the period to the end of March 2016. However, these data are not collated in ECORDA so it has not been possible for the evaluation team to carry out any separate analysis on this funding stream.

The images on the cover of this document are of drawings by Gabriel Hayes who was commissioned in 1941 to design and complete a range of carved stonework for the facade of the Department of Industry and Commerce building at Kildare Street.

Department of Jobs Enterprise and Innovation

23 Kildare Street
Dublin 2
D02 TD30

Tel: +353 1 631 2121
LoCall: 1890 220 222

Email: info@djei.ie
www.djei.ie



An Roinn Post, Fiontar agus Nuálaíochta
Department of Jobs, Enterprise and Innovation