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

Review of Progress in Implementing

Research Prioritisation

– Report of the Independent Panel

6th July 2015

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The members of the Panel would like to express their gratitude to the Government departments, State agencies and representative bodies who met with the Panel as part of the consultative process for this review for their cooperation and support. Their reflective and constructive contributions have been hugely beneficial to the exercise.

The Panel would also like to thank the Minister for Skills, Research and Innovation, Damien English T.D. for his personal engagement with the review.

1. Introduction

1.1 Background to Research Prioritisation

In the latter half of the 1990s and the early 2000s, Ireland embarked on a programme of significantly expanded public investment in RD&I. There were two strands to this programme: an infrastructural strand operated by the Higher Education Authority; and a people / investigators strand operated by the newly-established Science Foundation Ireland (SFI). SFI's mandate was to support *oriented basic research*[1] in two areas: Biotechnology and ICT[2].

Over the period 2001-2007 years these complementary programs were responsible for sustained increases in public investment that grew at a rate well in excess of growth in the economy. Other, sectoral-aligned research funders (Government departments and state agencies) introduced or expanded their research programmes as part of the overall uplift in public investment in research over this period.

As a result of this sustained investment, Ireland developed world-class research capacity across a range of fields. Both the quantity and quality of scientific output have increased, as gauged by academic publications and citations. Ireland has attained world-leading ranking for citations per paper in several key fields of science:

- 1st in Immunology,
- 1st in Animal and Dairy,
- 3rd in Nanoscience,
- 4th in Computer Science,
- 6th in Materials Science.

Ireland is ranked 20th overall for *citations per paper*, across all fields.

In parallel with this growing domestic capability in RD&I, Ireland enjoyed considerable success in attracting FDI in high value-added industries aligned with the chosen fields of RD&I specialization (e.g. Medical Devices, Biopharma and ICT). Much of this investment was directly linked to public research facilities and capacity.

In 2010 the Government initiated a review of the achievements over the preceding decade with a view to establishing a new framework to guide future investment in RD&I. While the focus of the previous decade had been building capacity in the public research system, the Government was of the view that, for the next phase of development of the national innovation system, greater emphasis should be placed on the economic returns from further public investment. The down-turn in 2008 added additional impetus to this re-orientation.

To this end, the Government undertook the National Research Prioritisation Exercise (NRPE) to establish a framework to guide economically-motivated RD&I investment for the five-year period

[1] "Oriented basic research is carried out with the expectation that it will produce a broad base of knowledge likely to form the basis of the solution to recognised or expected, current or future problems or possibilities". (*Frascati Manual*, OECD, 2002, Par. 243).

[2] SFI's mandate was extended in 2013 to enable it also fund *applied* research.

2013-2017. The framework was intended to maximize the impact of public investment on jobs and socio-economic progress.

The Government appointed a Steering Group to lead the NRPE. The Group comprised senior representatives of key stakeholders including enterprise, academia and public policy. This inclusive approach was important not only for accessing the best available intelligence to guide the exercise, but also for securing buy-in from the stakeholders and, ultimately, expediting implementation.

The Government set the following terms of reference for the exercise:

1. Develop a consensus on a number of priority areas and/or approaches to tackling national challenges which need to be underpinned by future investment in publicly funded STI,
2. Identify a list of supporting fields of science and technology that will underpin the priority areas and/or approaches to national challenges in the medium term (5 years) and beyond,
3. Identify actions required for each of the priority areas put forward including goals to be realized in the medium term (5 years) and beyond

The following additional guidance was provided:

- The Prioritisation Exercise should take account of fields of research activity where Ireland has built significant strength to date, and particularly areas that have the greatest potential to deliver sustainable economic return through enterprise development, employment growth, job retention and tangible improvements to quality of life.
- The exercise should also identify fields of science where new strengths could be developed in support of priority areas.
- The exercise should take account of complementary developments at the EU level (Framework programs, *etc*.) and other international initiatives.

In February 2012 the Government accepted the recommendations contained in the *Report of the Research Prioritisation Steering Group*[3] and set the implementation of RP as its primary STI policy goal for the five-year period, 2013-2017.

1.2 Overview of Research Prioritisation

The key objective of RP is to accelerate the realisation of economic returns from Government investment in public research. RP is intended to achieve this objective by aligning public investment which is *competitively-awarded* and for *economic objective*s with 14 *Priority Areas* that have been identified as presenting particular opportunities for Ireland.

The precise criteria used to select the areas are set out in Table 1.1.

[3] http://www.djei.ie/publications/science/2012/research_prioritisation.pdf

Table 1.1: Criteria used to select the Priority Areas (PAs)	
1.	The PA is associated with a large global market or markets in which Irish-based enterprises already compete or can realistically compete.
2.	Publicly performed R&D in Ireland is required to exploit the PA and will complement private sector research and innovation in Ireland.
3.	Ireland has built, or is building, strengths in research disciplines relevant to the PA.
4.	The PA represents an appropriate approach to a recognised national challenge and/or a global challenge to which Ireland should respond.

The fourteen Priority Areas are listed in Table 1.2.

Table 1.2: Priority Areas	
A	Future Networks & Communications
B	Data Analytics, Management, Security & Privacy
C	Digital Platforms, Content & Applications
D	Connected Health & Independent Living
E	Medical Devices
F	Diagnostics
G	Therapeutics – Synthesis, Formulation, Processing & Drug Delivery
H	Food for Health
I	Sustainable Food Production & Processing
J	Marine Renewable Energy
K	Smart Grids and Smart Cities
L	Manufacturing Competitiveness
M	Processing Technologies & Novel Materials
N	Innovation in Services & Business Processes

In addition, RP identifies six Platform Science and Technologies necessary to underpin research in the Priority Areas: *Basic Biomedical Science; Nanotechnology; Advanced Materials; Microelectronics; Photonics; and Software Engineering*.

Research Prioritisation also acknowledges the requirement for investment in complementary research:

1. *Research for Policy* (see Box 1) to support the development of public policy and the delivery of public services; and
2. *Research for Knowledge* to support the training and development of young researchers.

Finally, the Research Prioritisation Steering Group put forward 13 systemic recommendations aimed at improving the efficiency and effectiveness of the Science, Technology and Innovation (STI) system.

Box 1: Scope of Research for Policy

Research for Policy includes scientific investigations to underpin *evidence-based* regulation; legislation; the setting of national goals and targets; and the negotiation of international treaties. It also includes research for the purposes of enhancing the administration, practice and delivery of public services such as healthcare.

1.3 Implementation of RP

The Prioritisation Action Group (PAG) was established in March 2012 to drive implementation of RP. It is chaired by the Minister for Skills, Research & Innovation and is composed of the principal State agencies and Government departments funding research (see Appendix D).

The PAG's Terms of Reference specify the following primary tasks:

- Oversee the development and execution of action plans for the 14 priority areas;
- Take forward and implement the 13 systemic recommendations outlined in the Report;
- Develop stronger and more pro-active cross-Departmental or inter-agency cooperation for joint calls;

The PAG established Working Groups to develop a comprehensive action plans for each PA. The PAG monitors progress on the implementation of action plans on a quarterly basis. The actions address 5 broad objectives in the context of each PA:

1. Developing a Strategic Research Agenda;
2. Ensuring the supply of necessary Skills;
3. Commercialisation and Technology Transfer of public research;
4. Provision of necessary Infrastructure; and
5. Compliance with relevant or emerging Standards and Regulations.

There are a total of 274 actions across the 14 priority areas. For each action a lead-agency/department with primary responsibility for delivery is specified, along with a deadline for completion or key milestone. All actions are due for completion by end Q4 2016.

The Government endorsed and published the Action Plans, one for each Priority Area, in July 2013[4]. The first progress report on implementation was published in June 2014[5].

1.4 Background to the Review

In adopting Research Prioritisation, the Government charged the Department of Jobs, Enterprise and Innovation (DJEI) with monitoring implementation and in particular, commissioning an independent

[4] http://www.djei.ie/science/technology/rpmaps.htm
[5] http://www.djei.ie/publications/science/2014/NRPE_First_Progress_Report.pdf

review of progress. A number of considerations led to the decision to initiate this review in the autumn of 2014.

Research Prioritisation was adopted by Government at the nadir of the economic downturn, at a time when *jobs* and fiscal adjustments, mandated by the *troika's* bail-out programme, dominated policy thinking. Following Ireland's exit from the bail-out programme, and with the resumption of growth during 2014, a longer-term policy outlook was required to ensure that Ireland is laying the foundation for sustainable (economically and environmentally), long-term growth.

The Government remains strongly committed to RD&I as it believes that RD&I are key drivers of long-run economic growth. However, with limited resources to invest, Ireland must ensure that all investment decisions are prudent and optimal.

In addition, the mid-point in the lifecycle of Research Prioritisation (2012-2017) is an opportune time for an assessment of what lessons from the first phase of implementation could be carried forward to the second phase.

1.5 Methodology of the Review

A panel of seven distinguished, independent, national and international experts has been convened by DJEI to undertake an assessment of progress to date. The membership of the Panel, and its Terms of Reference, are set out in Appendices A and B, respectively.

The review was centred on a two-day meeting in Dublin in December 2014 during which time the panel had direct consultations with a comprehensive range of stakeholders in Research Prioritisation. The full list of consultations is set out in Appendix C.

The panel was provided with a range of pertinent documents and statistical data in advance of the meeting in Dublin to support their review:

- Report of the Research Prioritisation Steering Group, Forfás/DJEI, 2012
- Priority Area Action Plans (A-N), Forfás/DJEI, 2013
- Research Prioritisation: A Framework for Monitoring Public Investment in Science, Technology and Innovation, Forfás/DJEI, 2013
- National Research Prioritisation Exercise: First Progress Report, Forfás/DJEI, 2014
- State Investment in R&D 2012-2013, Forfás/DJEI, 2013
- Survey of Research and Development in the Higher Education Sector 2010/2011, Forfás/DJEI, 2013
- Knowledge Transfer Ireland: First Annual Report, KTI, 2014
- Directory of Research Centres and Technology Centres 2015, DJEI, 2014
- From Bricks to Brains: Increasing the contribution of Knowledge-Based Capital to Growth in Ireland, OECD, 2013.
- RIS3 Peer Review Report Ireland, European Commission, 2014
- Research and innovation as sources of renewed growth, European Commission, 2014

2. Findings

2.1 Headline Findings

- The objectives of RP were to create research activities of critical mass in areas of importance to Ireland; to efficiently extract value from the national research investment; and to take research to market faster than in other jurisdictions.
- The panel finds that the steps taken to date have advanced Ireland towards these goals, by aligning public research with 14 areas where the economic opportunities are considered to be greatest; and by increasing the focus on economic impacts.
- While the concentration of effort on 14 areas has attracted substantial attention within the Irish research and innovation system, the sharpened focus on outcomes is arguably the more significant achievement.
- Research Prioritisation (RP) was a timely and appropriate exercise, aligning the Irish research system with identified areas of economic opportunity at a time of grave economic difficulty.
- The most important steps in support of prioritisation have been those taken by Science Foundation Ireland, the primary and most influential funder of competitive research nationally.
- While achievements to date in terms of the implementation of the exercise have been significant, there is scope for improvement and the approach to the implementation of RP should be adapted to reflect experiences to date and the evolved socio-economic context.
- There is a need to address support for areas outside the scope of RP (e.g. Research for Policy[6], Research for Knowledge) and the needs of the wider skills agenda in a more systematic manner.

[6] See Box 1, Section 1.2.

2.2 Positive Impacts

1. Ireland's research budget, in absolute terms, is smaller than those available in competitor nations and very small in comparison with the budgets available in larger nations. A strategy of prioritisation based on prudent investment in excellent research in a small number of strategically chosen areas with a focus on near-term economic impact represents the greatest chance of delivering such impact.

2. RP has provided a coherent economic rationale and roadmap for public investment in research despite the acute fiscal pressure on the Exchequer over the period 2012-2015.

3. RP initiated a shift in emphasis on the part of both *funders* and research *performers* from *inputs* towards *outcomes* and *impact*.

4. RP has significantly altered the national research system in a short space of time. The principal public funders of research (Government departments and State agencies) have palpably modified their *modus operandi* in line with the overall goals of the exercise. The establishment of a tracking framework involving well-articulated timelines and milestones stimulated implementation and provided an overview of progress.

5. There is evidence of increased collaboration and consolidation of research effort across the public research system in recent years. In addition, collaboration between enterprise and the public research system has also grown. This is manifest, for example, in the level of enterprise commitment to the new SFI research centres (*in-kind* and *cash*, 30% and 10%, respectively). While is it not possible to attribute credit for these developments exclusively to RP, it is likely that RP has been a significant contributory factor.

6. A more unified system of public research funding is emerging, aided by the presence of funding bodies around the same table at the Prioritisation Action Group. Funders are now adopting a more system-level approach to their missions, with greater coordination and tangible cooperation such as the co-funding of programmes.

7. For the enterprise development agencies, RP brought a sharper focus to their efforts to support innovation in their client firms. In particular, it has prompted them to identify the detailed research needs of their clients via surveys and workshops and to consider how the public research system can best address these needs.

8. The 12 SFI Research Centres, of *excellence* and *scale*, are strongly aligned with RP (either the 14 PAs or the 6 underpinning S&T platform technologies), as are the 15 EI/IDA Technology Centres that operate at higher Technology Readiness Levels (TRLs)[7].

9. The RP areas are broadly well-aligned with the themes in the European Commission's Framework Programme, *Horizon 2020*. The emphasis on economic impact in RP and the scale of the SFI research centres should enable Irish-based researchers within Priority Areas to leverage national funding to draw down greater funding from Horizon 2020.

[7] http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

10. The Irish RP exercise has generated interest in international circles and furthered Ireland's reputation as a country actively seeking to derive economic impact from research.

2.3 Challenges

1. It is still too early in the life-cycle of Research Prioritisation to identify specific economic impacts. While there is evidence that Ireland is a global leader in some areas of focus, this likely predates RP.

2. RP remains contentious across the public research system, with a strongly-held view in certain quarters that the longer-term needs of the country are better served by a focus on excellence across all areas rather than on shorter-term economic outputs.

3. The number of priority areas, at 14, is too large to adequately convey the notion of prioritisation. This poses a challenge in communicating national strategy and capability to enterprise, both domestic and foreign (potential inward investors).

4. The implementation of RP has not addressed the question of to what extent, and how, research outside the 14 priority areas would be able to compete for funding. This is despite the fact that the report of the *Research Prioritisation Steering Group* explicitly acknowledged the importance of *research for policy*[8] and *research for knowledge* (basic research) and called for separate funding streams to support them.

5. In the absence of an agreed national strategy relating to this point, other research funders have had no option other than to implement individual, parallel strategies, which is sub-optimal from an efficiency perspective and has resulted in the emergence of lacunae in the system. For many research areas, including most of the Humanities and Social Sciences, and basic and applied STEM outside the 14 priority areas, the only national funding schemes available are those administered by the Irish Research Council. These account for 4% of total public investment in R&D and concentrate on individual awards for PhD students and postdoctoral researchers.

6. The scarcity of national funding for areas outside RP, even in some areas where Ireland had significant capacity prior to RP, may undermine Ireland's ability to respond to emerging or unforeseen areas of opportunity in the future. There is a concern that researchers from those areas will exit the system, with adverse consequences for higher education, skills supply and the broader ecosystem.

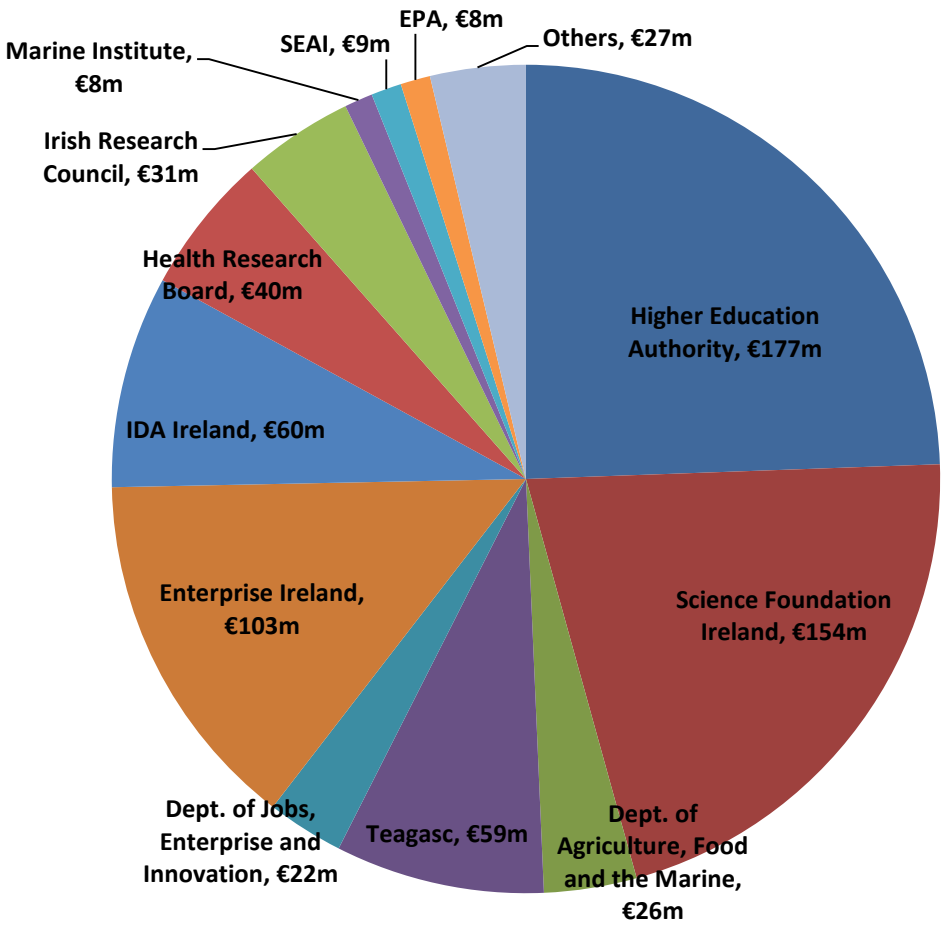
7. The reduction in the core grant to higher education institutions over recent years, which occurred independently of, but concurrently with, RP has undermined the capacity of the higher education system to carry out research. It is inconsistent to safeguard and even increase the size of competitive funds in priority areas whilst simultaneously limiting the ability of HEI staff to act as Principal Investigators by reducing core funding to higher education, yet this is precisely what has happened in Ireland. If the full potential of prioritisation is to be realised, this situation has to be rectified.

8. It is not possible to say definitively what percentage of the total Government R&D budget, as shown in Figure 1, has followed RP. The largest segment of funding is provided by the HEA in

[8] See Box 1, Section 1.2.

the form of core grant to the HEIs. This grant is not prioritised according to the RP process, and to a large extent funds the salaries of research faculty, rather than the research itself. Excluding this portion, along with grants by IDA Ireland and Enterprise Ireland for in-company R&D and other non-RP funding from Figure 1, indicates that less than half of national research expenditure is prioritised according to RP. However, this portion accounts for the vast majority of the funding competitively available to researchers to support their activity, with researchers in many areas excluded from all but the small Irish Research Council funding.

Figure 1: Government Budget Appropriations for R&D 2014 (€724m)



Breakdown of public investment in research by major funding agency/department.
Source: State Investment in R&D 2013-2014,DJEI.

9. The most significant steps in support of prioritisation have been those taken by Science Foundation Ireland, the primary and most influential funder of competitive research nationally. SFI has nevertheless recently showed some flexibility in recognising additional areas such as Geoscience, where a convincing case was made by the research community and the relevant stakeholders.

10. The link between research, Human Capital[9] and economic impact has not been adequately addressed in the implementation of RP. The implementation to date has focused largely on *direct* economic impacts of public investment in R&D such as patents, licenses and spin-outs. However, the *indirect* contribution from the formation of human capital is essential for realising the full economic impact of public R&D.
    The requirement for more interdisciplinary teams, including the humanities and social sciences, in many areas of research also needs to be better addressed.

[9] Knowledge and skills embodied in people.

11. It is important for the research and innovation ecosystem to balance support for large, nationally coordinated centres of critical mass with support for excellent individual researchers and small teams of international standing.

12. Uniform progress across all 14 Priority Areas would have been an unreasonable expectation given that funding decisions are largely based on competitive assessment. Progress in *Manufacturing Competitiveness;* and *Innovation in Services and Business Processes* has lagged behind that in other priority areas. For example, there is no SFI research centre dedicated to either area, despite the fact that these areas underpin two of the most important activities in the Irish economy[10] .

13. Ireland has a large number of public bodies funding research relative to the size of the budget available for investment (although, the funding of research is the *primary* function of only a small number of these bodies). This poses challenges for coordination and the attainment of critical mass in particular areas.

14. It is the perception of the Panel that the PAG has largely fulfilled its original mandate and that while its focus to date on the *process* of implementation was appropriate, both its composition and its mandate should now be renewed. For instance,

    a) Departments and agencies with a societal research agenda find that the enterprise/ economic orientation of the PAG is not fully compatible with their mandates. However, there is no alternative or complementary forum to the PAG: "*it is the only game in town*". RP has become in effect the sole instrument of national STI policy.

    b) There are no representatives from enterprise, the investment community or the research performers on the PAG. These stakeholders have had no formal involvement in RP since the publication of the report of the RPSG in 2012.

    c) The designation of a *champion* for each of the priority areas has proven to be less effective in driving implementation of actions by organisations other than the champion's own.

    d) Horizon Scanning is not being conducted in a systematic way; at best it is being undertaken on a sectoral basis, or by individual agencies.

[10] SFI have issued two calls for proposals for Research Centres in which Manufacturing Competitiveness was an eligible topic. SFI did not receive any applications meeting the required excellence standards.

3. Recommendations

1. The focus on research *priorities*, *outcomes* and *impacts* in the context of publicly-funded research in support of enterprise should be maintained in order to realise the full economic benefit from such investments over the medium-long term.

2. Research Prioritisation should be positioned in a broader, strategic research framework which recognises the need to fund excellent research in other areas, in order to underpin the wider skills agenda, to meet broader societal goals and to further enhance Ireland's reputation for outstanding science.

   To this end, a clear strategy should be developed for areas outside Research Prioritisation, in particular,

   - Research for policy[11];
   - Research for knowledge; and
   - Research linkages with education and skills[12].

3. There is clear difficulty in communicating and realising 14 broad research areas as "priorities". A more unified and accessible characterisation of public research in support of enterprise should be adopted. The six sectorally-aligned, themes adopted for the *Innovation Showcase 2014* (Health & Medical; Food; Energy; Manufacturing & Materials; Business Processes; and ICT) may provide a useful starting point for such a reconfiguration. This reconfiguration should be done in a manner which does not detract from the value of what has been achieved to date in the individual priority areas.

4. A *Horizon Scanning* exercise should be undertaken periodically to ensure that new economic opportunities are identified in a timely manner. The adoption of new focus areas should be based on a transparent process, with clearly defined expected outcomes.

5. A defined percentage of total government investment should be made available as competitive funding across all disciplines. This programme could be a national analogue to the European Research Council and would fund researchers based solely on excellence. This fund should particularly target early-career researchers.

6. The development of human capital, aligned with the current and future needs of enterprise and society, should be recognised as a key goal of RP.

7. Targeted initiatives should be considered to boost research capacity in the key areas of the *Manufacturing Competitiveness* and *Innovation in Services and Business Processes* priority areas. Appropriate attention should be paid to the non-technological aspects of the latter, particularly skills in the social sciences and humanities.

[11] See Box 1, Section 1.2.

[12] *The National Strategy for Higher Education to* 2030 and the *Higher Education System Performance Framework 2014-2016* provide an important basis for this consideration.

8. Investments in research centres of scale should continue to be complemented by investments in smaller, creative research teams in order to maintain balance in the research ecosystem. The smaller teams should be required to have the same orientation towards impact as the centres.

9. Research strategies for societal objectives and for economic objectives should be integrated to form a *stratified set of national priority areas*: areas in which Ireland intends to become a world-leader; areas needed to support key societal goals; and areas where it would be prudent to maintain capacity in anticipation of future opportunities[13].

10. A national, governance structure should be established for research oversight and strategic planning, encompassing research for economic, societal and policy objectives; links between research and human capital formation; EU programmes; and horizon scanning.

11. In the context of that structure, the mandate and composition of the PAG should be renewed. While it should continue to coordinate and oversee the completion of the action plans for the Priority Areas, it should adopt a more strategic perspective:

    a. The PAG should shift its focus from the *process* of implementation to its *effectiveness* i.e. from monitoring *inputs* to monitoring *outcomes/impacts*[14].

    b. The PAG should be more broadly constituted and include representatives of other stakeholders in public research: enterprise; the investment community; and research performers.

    c. The agency/department representatives on the PAG should be held directly accountable to the PAG for the delivery of actions by their agency/department.

    d. Either a reconstituted PAG or another element of the broader national structure should include a focus on research for societal and policy considerations.

12. A concerted, system-wide initiative is required to engender greater engagement (meaningful, risk-sharing collaborations) between firms (particularly SMEs) and the public research system. The initiative should, based on feedback from firms, actively simplify and streamline processes and remove obstacles to collaboration. The initiative should also disseminate information to enterprise to improve its understanding of the public research system and the raft of opportunities and supports available.

13. Where funding is particularly associated with expected economic outcomes, agencies should seek formal customer feedback from the end-users of the research they support.

14. Exchange programmes between enterprise and academia should be further developed. Opportunities exist at middle management as well as scientific levels for career path development via exchange. The IRC *Employment-based Postgraduate Programme* and the SFI *Industry Fellowship Programme* are positive developments in this regard.

[13] The *Top Sectors* approach in the Netherlands is an illustrative example of such a strategy (www.government.nl/issues/entrepreneurship-and-innovation/investing-in-top-sectors).
[14] "Impact" should be understood to encompass societal as well as economic benefits.

15. The existing national accounting system for research investment should be complemented by the elaboration and use by all public funders of a shared categorisation scheme outlining how public investment of R&D is deployed and used (e.g. by classifying expenditure in terms of relevance to national innovation system goals) . The absence of a standardised approach to the collection of data of this nature within the existing national accounting system for research investment is a major impediment to system-level monitoring, management and impact assessment.

3.2 Conclusion

In the final analysis, the Research Prioritisation exercise in Ireland can be adjudged as a positive step towards a national research system which is characterised by both its excellence and its contribution to Ireland's competitive advantage. It has achieved some major short-term goals and could presage longer-term cultural changes. However, there is scope for improvement in its execution.

Further steps are needed to streamline and strengthen the governance system for RP. In addition, increasing alignment with European Research Programmes could offer greater international collaborative opportunities, as well as levering national investment.

Research Prioritisation needs to be set in the context of the nation's wider research strategy, so that those complementary elements of the national research ecosystem, which were included in the original RP report but not implemented, are included in future in a coordinated way.

Appendix A: Members of the Panel

Prof Jerzy Langer - *Chair*	President	Wroclaw Research Centre EIT+; Polish Academy of Sciences, Institute of Physics, Warsaw
Prof Orla Feely	Vice President for Research, Innovation and Impact	University College Dublin
Tom Flanagan	Head of Commercialisation	Dublin Institute of Technology
Dr Alastair Glass	President	Transparent Solutions Inc. *former* Chairman, Tyndall National Institute
Ken Guy	Head STI Division	Organisation for Economic Co-operation and Development
Denis Hayes	Managing Director	Industry Research and Development Group
Prof Eugene Kennedy	Science Secretary	Royal Irish Academy

Appendix B: Terms of Reference

1. Objective

The high-level objective for the assessment is to advance the National Research Prioritisation Exercise by expediting implementation of the associated recommendations and actions. To this end, the assessment should be forward-looking and findings should be normative and constructive.

The specific objective is to provide independent assessment of progress made in the implementation of Research Prioritisation, as set out in the report of the Research Prioritisation Steering Group (RPSG).

2. Specific Requirements

The specific requirements for the assessment exercise are set out below:

1. Assess progress in re-orienting competitively-awarded investment for economic objectives, in publicly-performed research, towards the 14 Priority Areas.
2. Assess progress in bringing about a "*step change in the efficiency and effectiveness of the current STI system*", with regard to the 13 systemic recommendations in the Report.
3. Assess progress in relation to the wider context identified for the Priority Areas, specifically, the six underpinning (platform) Science and Technology areas and Integrating Infrastructure.
4. Assess the effectiveness of the Research Prioritisation Action Group and its success as a mechanism to drive implementation of research prioritisation.

In presenting the findings of 1-4, the assessment exercise should:

5. Highlight examples of good practice or where substantial progress has been made.
6. Identify areas of poorer performance where redoubled efforts are required.
7. Bring forward proposals for addressing any identified weaknesses or for accelerating progress overall.

Appendix C: List of Consultations

American Chamber of Commerce Ireland
Dept. of Agriculture, Food and the Marine
Dept. of Education and Skills
Dept. of Jobs, Enterprise and Innovation
Dept. of Health
Dept. of the Environment, Community and Local Government
Enterprise Ireland
Environmental Protection Agency
Health Research Board
Higher Education Authority
Horizon 2020 National Support Network
Ibec
IDA Ireland
Institutes of Technology Ireland
Irish Research Council
Irish Universities Association
Irish Venture Capital Association
Knowledge Transfer Ireland
Marine Institute
Minister for Skills, Research & Innovation
Science Foundation Ireland
Sustainable Energy Authority of Ireland
Teagasc

Appendix D: Prioritisation Action Group

The Prioritisation Action Group (PAG) was established in March 2012 to drive implementation of RP. It is chaired by the Minister for Skills, Research & Innovation and is composed of the principal State agencies and Government departments funding research.

Membership of PAG
Enterprise Ireland
Environmental Protection Agency
Health Research Board
Higher Education Authority
IDA Ireland
Irish Research Council
Marine Institute
Science Foundation Ireland
Sustainable Energy Authority of Ireland
Teagasc
Department of Agriculture, Food and the Marine
Department of Communications, Energy and Natural Resources
Department of Education and Skills
Department of the Environment, Community and Local Government
Department of Foreign Affairs and Trade
Department of Health
Department of Jobs, Enterprise and Innovation
Department of Public Expenditure and Reform
Department of the Taoiseach