



# ERAWATCH Country Report 2009

Analysis of policy mixes to foster R&D investment  
and to contribute to the ERA

## Ireland

Tom Martin



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EUROPEAN COMMISSION

# ERAWATCH COUNTRY REPORT 2009: Ireland

Analysis of policy mixes to foster R&D  
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ERAWATCH Network – Tom Martin & Associates/TMA

Tom Martin

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## Executive Summary

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As highlighted by the Lisbon Strategy, knowledge accumulated through investment in R&D, innovation and education is a key driver of long-term growth. Research-related policies aimed at increasing investment in knowledge and strengthening the innovation capacity of the EU economy are thus at the heart of the Lisbon Strategy. This is reflected in guideline No. 7 of the Integrated Guidelines for Growth and Jobs. This advocates increasing and improving investment in research and development (R&D), with a particular focus on the private sector. This report aims at supporting the mutual learning process and the monitoring of Member States efforts. Its main objective is to characterise and assess the evolution of the national policy mixes in the perspective of the Lisbon goals, with a particular focus on the national R&D investments targets and on the realisation and better governance of the European Research Area. The report builds on the analytical country reports 2008 and on a synthesis of information from the ERAWATCH Research Inventory and other important available information sources.

After a decade of almost continuous economic growth, the Irish economy is experiencing severe difficulties due to a combination of external and internal factors such as a contraction in the construction sector, declining international competitiveness and the international credit crunch.

The Irish Government has put research and innovation at the core of economic development policies. The Government's policy framework document, *Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal* (December 2008), highlights the need to re-prioritise policies to stimulate the economy including an emphasis on investing in research and development and on building the innovation or 'ideas' component of the economy through the utilisation of human capital.

Irish R&D intensity (measured as GERD as a % of GDP) has been increasing; it rose from 1.25% in 2005 to an estimated 1.44% in 2008, a 15% increase. Business expenditure on R&D (BERD) was estimated to account for 67% of GERD in 2008; business sector R&D intensity grew from 0.82% in 2005 to an estimated 0.96% in 2008, an increase of 17%.

The Irish National Reform Programme 2008-2010 outlines the Government's strategy for investing in knowledge and innovation to build a knowledge-based economy.

The Programme states that Ireland will continue to make progress towards the Lisbon R&D target and despite the tougher global conditions it is anticipated that Gross Expenditure on R&D (GERD) will reach 1.9% of GNP (1.6% of GDP) in 2010, up from 1.32% of GNP in 2000 and 1.56% of GNP in 2006. It notes that the goal of the Strategy for Science, Technology and Innovation 2006–2013 (SSTI) is that enhanced performance in business, higher education and public sector R&D should result in GERD increasing to 2.5% of GNP by 2013.

Barriers to R&D investment	Opportunities and Risks generated by the policy mix
Weak linkages between higher education and indigenous enterprise sectors	Opportunity to commercialise the knowledge created arising from Ireland's technology foresight investment programme in ICT and biotechnology
Small base of indigenous R&D performing companies	Existing policies may not be sufficient to encourage enterprises who do not perform R&D to become involved in research
Lack of integrated research and innovation policies	Provision of revised and simplified structure of STI initiatives have the potential to create better synergies between research and innovation
Lack of specialised or sector-specific research organisations and dedicated technology agency	There is a risk that the higher education institutions who are been asked to undertake a technology transfer role in addition to their primary teaching and research missions may not have the necessary attributes to do so

The first report on the SSTI (2008) reveals that expenditure on research and development within the higher education sector has almost quadrupled in current terms over ten years 1996–2006 and has now reached the OECD and EU-25 average HERD intensity rates. The latest preliminary BERD figures for 2007/2008 indicate continued growth in expenditure by enterprises on R&D. The National Competitiveness Council in its Annual Competitiveness Report 2008 states that despite strong growth rates in expenditure, business R&D as a percentage of economic activity has remained relatively static over the past decade. This raises concerns whether Irish business expenditure on research and development will achieve its target of 1.7% of GNP by 2013 as outlined in the SSTI.

Several structural factors form barriers to investment in R&D by the private sector in Ireland. Multinational companies based in Ireland account for approximately 70% of BERD and a significant proportion of this expenditure is accounted for by a small number of companies. Expenditure on research and development among the indigenous enterprise sector, which mainly comprises SMEs, is largely concentrated in a small number of business sectors such as software/computer-related and among a small number of companies.

Other structural barriers include the lack of specialised or industry-specific research organisations in Ireland to assist in the transfer of technology to the enterprise sector.

Recent policy documents such as the Irish National Reform Programme 2008-2010 and Building Ireland's Smart Economy put considerable policy emphasis on the establishment of new R&D performing enterprises (policy mix route 1) and encouraging existing R&D performers to invest more in research (policy mix route 2).

The Government in its policy mix formulation is also putting considerable emphasis on attracting a greater share of mobile FDI R&D projects. The Government announced in the 2009 Budget that it was enhancing the R&D tax credit so as to maximise Ireland's attractiveness as a location for multinational companies to undertake research and development. It remains to be seen whether in the current difficult international economic environment the improved tax credit will be successful.

The development of linkages between the enterprise and higher education sectors in an important policy objective. New and existing support measures seek to strengthen the transfer of skills and knowledge from the higher education institutions to the enterprise sector. A key Government objective is to commercialisation of research outcomes from the substantial investment in research and development Ireland has made in the higher education sector.

The lack of specialised or sector-specific research institutions means that the higher education institutions will be required, in addition to their existing teaching and research roles, to initiate and support innovation in the enterprise sector.

	<b>Short assessment of its importance in the ERA policy mix</b>	<b>Key characteristics of policies</b>
Labour market for researchers	<ul style="list-style-type: none"> <li>• Ireland attaches great importance to the issue of researcher mobility within the ERA. The issue of researcher careers – producing, retaining and attracting the appropriate quantity and quality of researchers to meet the needs of a knowledge-intensive economy – is a top priority for Ireland</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of the European Charter for Researchers and Code of Practice for their Recruitment</li> <li>• Implementation of the Third Country Directive for Admission of Researchers</li> <li>• Development of career framework for researchers</li> </ul>
Governance of research infrastructures	<ul style="list-style-type: none"> <li>• Support for the Green Paper's emphasis on the ESFRI road-map</li> <li>• Development of outline public sector research infrastructure policy</li> </ul>	<ul style="list-style-type: none"> <li>• Participation in ESFRI activities</li> </ul>
Autonomy of research institutions	<ul style="list-style-type: none"> <li>• Government policy is to encourage higher education institutions and public research organisations to collaborate, where appropriate, in order to nurture a shift away from project-based funding to longer-term, strategic research programmes where a critical mass of activity can be generated and sustained</li> </ul>	<ul style="list-style-type: none"> <li>• Cycle 5 of the Programme for Research in Third Level Institutions continues to promote higher education institutional collaboration</li> </ul>
Opening up of national research programmes	<ul style="list-style-type: none"> <li>• Ireland is supportive of the main thrust of the Green Paper in terms of having a strong international dimension to science and technology</li> </ul>	<ul style="list-style-type: none"> <li>• Ireland is an active participant in ERA-NET and JTI projects and in pilot initiatives associated with Joint Programming of Research</li> </ul>

ERA and ERA-related policies are regarded as having important influences on Irish science, technology and innovation policies. This can be observed in relation to researcher mobility which is an issue of key importance to Ireland given its ambition to be a leading knowledge economy. Irish policy-makers consider that national and EU policies on researcher mobility show a clear overlap as both aim to improve the mobility of researchers generally and young researchers and women in science in particular. Important Irish initiatives in this area with a strong ERA connection are the transposition of the Third Country Directive and the development of the [researchcareersireland.com](http://researchcareersireland.com) web site.

ERA policies, in particular the ESFRI initiative, have also influenced Irish thinking in relation to research infrastructures. A deliberate decision was taken by the Irish authorities in reviewing Irish higher education research infrastructures to involve partners from the ESFRI network in order to maximise the alignment between national strategies and the ESFRI Roadmap.

ERA's vision as articulated in the Green Paper, The European Research Area: New Perspectives, and agenda for Europe's public research institutions are broadly reflective of the type of change that is already well underway within Ireland where higher education institutions and public research institutions are encouraged to collaborate in order to facilitate a shift from project-based funding to longer-term, strategic research programmes in order that a critical mass of activity can be generated and sustained.

The Irish National Reform Programme 2008-2010 document is unequivocal in specifying that national policies and programmes contribute directly and indirectly to the development of the European Research Area. The document states that all of the Government's STI policies and support measures, such as the attraction of researchers to Ireland and the strengthening of research capacity within the Irish enterprise base, are framed within the context of a broader ERA agenda.

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## 1 Introduction

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As highlighted by the Lisbon Strategy, knowledge accumulated through investment in R&D, innovation and education is a key driver of long-term growth. Research-related policies aimed at increasing investment in knowledge and strengthening the innovation capacity of the EU economy are thus at the heart of the Lisbon Strategy. This is reflected in guideline No. 7 of the Integrated Guidelines for Growth and Jobs.<sup>1</sup> This advocates increasing and improving investment in research and development (R&D), with a particular focus on the private sector. For the period 2008 to 2010, this focus is confirmed as a main policy challenge and the need for more rapid progress towards establishing the European Research Area, including meeting the collective EU target of raising research investment to 3 % of GDP, is emphasised.

A central task of ERAWATCH is the production of analytical country reports to support the mutual learning process and the monitoring of Member States' efforts in the context of the Lisbon Strategy and the ambition to develop the European Research Area (ERA). The first series of these reports was produced in 2008 and focused on characterising and assessing the performance of national research systems and related policies in a comparable manner. In order to do so, the system analysis focused on key processes relevant for system performance. Four policy-relevant domains of the research system have been distinguished, namely resource mobilisation, knowledge demand, knowledge production and knowledge circulation. The analysis within each domain has been guided by a set of generic "challenges", common to all research systems, which reflect possible bottlenecks, system failures and market failures which a research system has to cope with. The analysis of the ERA dimension still remained exploratory.

The country reports 2009 build and extend on this analysis by focusing on policy mixes. Research policies can be a lever for economic growth, if they are tailored to the needs of a knowledge-based economy suited to the country and appropriately coordinated with other knowledge triangle policies. The policy focus is threefold:

- An updated analysis and assessment of recent research policies
- An analysis and assessment of the evolution of national policy mixes towards Lisbon R&D investment goals. Particular attention is paid to policies fostering private R&D and addressing its barriers.
- An analysis and assessment of the contribution of national policies to the realisation of the ERA. Beyond contributing to national policy goals, which remains an important policy context, ERA-related policies can contribute to a better European level performance by fostering, in various ways, efficient resource allocation in Europe.

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<sup>1</sup> COM(2007) 803 final, "INTEGRATED GUIDELINES FOR GROWTH AND JOBS (2008-2010)", [http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-report-integrated-guidelines\\_en.pdf](http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-report-integrated-guidelines_en.pdf)

## 2 Characteristics of the national research system and assessment of recent policy changes

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### *2.1 Structure of the national research system and its governance*

Ireland with a population of 4.16m is one of the smallest EU Member States accounting for less than 1% of the population of the EU-25. After many years of continuous double-digit growth which placed Ireland among the richest nations in Europe, recent official data indicates that the Irish economy has experienced two consecutive quarters of negative growth and is thus in recession.

The Irish national research system can be characterised as being relatively new and consequently is in a state of ongoing development. In 2007, the main research players in Ireland were the private sector (67% of GERD), the higher education sector (26% of GERD) and the government sector (7% of GERD).

Funding for research has increased significantly since the publication of the White Paper on Science, Technology and Innovation in 1996. The White Paper acknowledged that for much of the period since the foundation of the State in 1922, science and technology (S&T) had been ignored and neglected. The Government acted on the recommendations of the White Paper by allocating €0.5b for research funding during the National Development Plan covering the period 1994–1999.

Research funding grew significantly during the period of the National Development Plan 2000–2006 when the Government spent €2.48b on R&D. The Government has committed €8.2b for research under the [National Development Plan \(NDP\) 2007–2013](#) to achieve the goals set out in the [Strategy for Science, Technology and Innovation 2006–2013](#) of making Ireland a leading knowledge economy.

#### **Main actors and institutions in research governance**

The two main STI funding ministries are the Department [Ministry] of Enterprise, Trade and Employment and the Department [Ministry] of Education and Science. Other ministries with a significant research budget include the Department of Agriculture and Food and the Department of Communications, Energy and Natural Resources.

The growth in research funding led in 2004 to the development of new R&D governance structures. At the apex is the Cabinet Sub-Committee on Science and Technology which includes the Taoiseach (prime minister), Tánaiste (deputy prime minister) and ministers from the ministries having a significant research agenda.

The [Chief Scientific Adviser](#) reports to the Cabinet Sub-Committee and has a remit to provide independent expert advice on any aspect of science, technology and innovation as requested by the Government.

The [Inter Departmental Committee on Science and Technology](#) (IDC) which is chaired by the Minister for Enterprise, Trade and Employment and consists of senior civil servants from the main research spending ministries and the Chief Scientific Adviser is responsible for implementing decisions made by the Cabinet Sub-Committee. The IDC plays an important role in assisting the prioritisation of science, technology and innovation expenditure across ministries and ensuring a "joined-up Government" approach to science and technology.

The [Advisory Council for Science, Technology and Innovation](#) consists of twelve members drawn from industry and academia and replaces the former Irish Council for Science, Technology and Innovation. Its functions are to act as the primary interface between stakeholders and policy-makers in the Science, Technology and Innovation (STI) arena, contributing to the development and delivery of a coherent and effective national strategy on STI and to provide advice to Government on medium and longer-term policy for STI and related matters.

The [Office of Science, Technology and Innovation](#) (OSTI) within the Department of Enterprise, Trade and Employment is responsible for the development, promotion and national co-ordination of science, technology and innovation policy. It is responsible for the science and technology budget, including EU funding, promoting research and technological development in industry and developing and coordinating Ireland's policy in international research activities.

[Forfás](#), the national economic development authority and advisory board, provides the Department of Enterprise, Trade and Employment (DETE) and other stakeholders with analysis, advice and support on issues related to enterprise, trade, science, technology and innovation.

[Science Foundation Ireland](#) (SFI) is responsible for managing Ireland's technology foresight investment in biotechnology and ICT. In 2008, the Government extended SFI's responsibilities to cover sustainable energy and energy-efficient technologies.

The [Higher Education Authority](#) (HEA) which is under the aegis of the Department of Education and Science is the funder of the HEA Block Grant which provides the necessary floor for research funding in the third level sector and the [Programme for Research in Third Level Institutions](#) which provides support for institutional strategies, inter-institutional collaboration, large-scale research programmes and infrastructure.

The HEA also administers the Strategic Innovation Fund which aims to support universities in increasing their capacity to produce high quality 3rd and 4th level outputs.

Two research councils were established in 2001 covering science and engineering subjects (Irish Research Council for Science, Engineering and Technology, IRCSET) and the humanities and social sciences (Irish Research Council for the Humanities and Social Sciences, IRCHSS) respectively. The Councils provide direct financial support to address individual research funding needs at Masters, Doctoral and Post-doctoral levels.

The Government has recently established the Research Funders Group under the chair of the Chief Scientific Adviser. This Group comprises the main research funding and advisory bodies and is intended to assist in the co-ordination and implementation of research funding.

Two new bodies were established by the Government to ensure the successful implementation of the Strategy for Science, Technology and Innovation 2006-2013:

1. **Technology Ireland:** this group of senior executives from Enterprise Ireland, IDA Ireland, Science Foundation Ireland, Forfás and the Higher Education Authority under the aegis of the OSTI has been charged with overseeing the implementation of required actions to achieve the targets set for enterprise R&D performance;
2. **The Higher Education Research Group (HERG)** comprises representatives from the main Government Departments responsible for funding Higher

Education-based research (the Departments of Education and Science, Enterprise, Trade and Employment and Finance) along with senior executives from the funding agencies of those Departments. The role of the HERG is to ensure coherence among key funding initiatives and the funding awards schemes of the relevant agencies and councils.

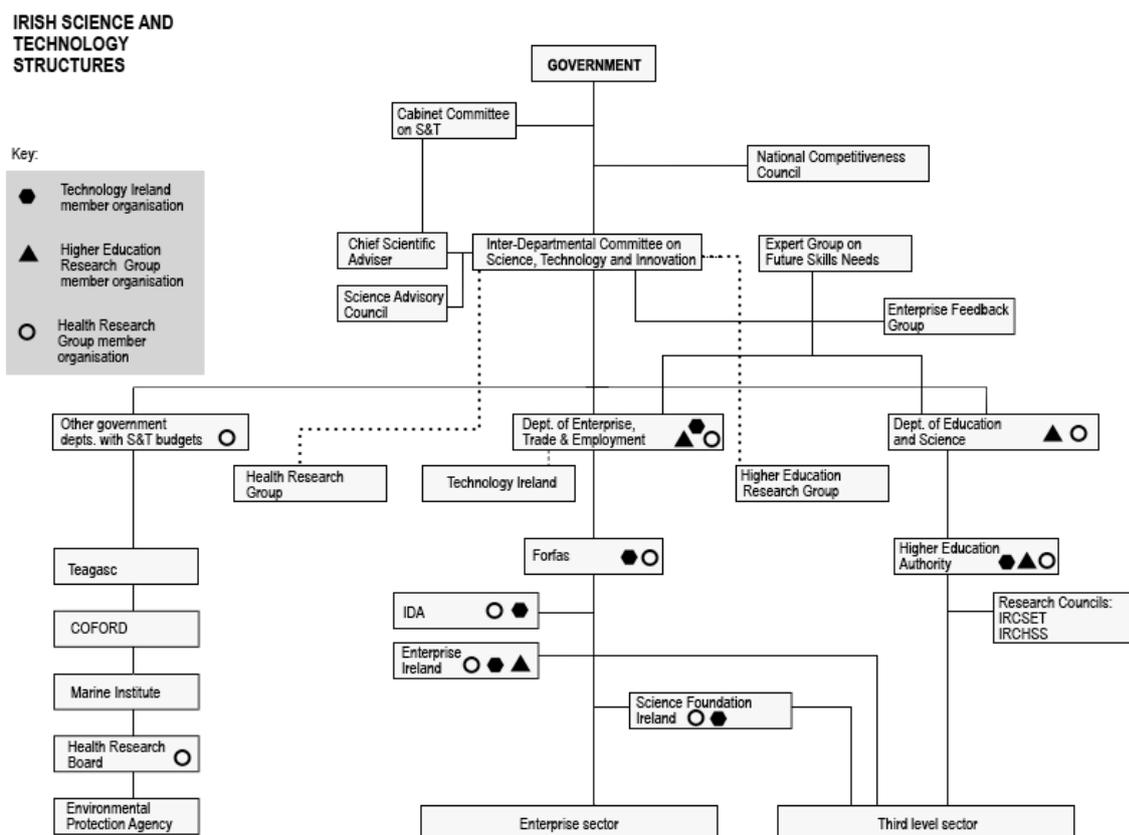
Furthermore, two additional bodies have been established as part of Ireland's evolving science, technology and innovation governance structure. Following a recommendation in the Advisory Science Council's report, *Towards Better Health: Achieving a Step Change in Health Research in Ireland*, a Health Research Group (HRG) has been established under the auspices of the IDC. Forfás provides secretariat support to the Group, which is chaired by the Department of Health and Children. The second group is the Enterprise Feedback Group (EFG) which is charged with providing feedback from business and industry on the SSTI and advice on the commercialisation of research outcomes from the Government's substantial investment in research and development.

The North-South body, InterTradeIreland, which was set up under the Good Friday agreement<sup>2</sup>, plays an important role in enhancing the global competitiveness of the all-island economy to the mutual benefit of the Republic of Ireland and Northern Ireland through measures such as the creation of knowledge-intensive all-island trade and business development networks and the implementation of all-island trade and business development programmes.

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<sup>2</sup> The Good Friday or Belfast Agreement which was signed by the British and Irish Governments on 10 April 1998 and which was endorsed by the majority of political parties in Northern Ireland commits all participants to exclusively democratic and peaceful means of resolving differences. It was endorsed by the people of Ireland, North and South, in referenda held simultaneously on 22 May 1998. The Agreement led, inter alia, to the establishment of a North-South Ministerial Council and North-South Implementation Bodies to bring about cross-border cooperation in policy and programmes on a number of issues.

**Figure 1: Overview of the governance structure of the Irish research system**



Source: [ERAWATCH Research Inventor: Ireland, 2009](#)

### Main research performer groups

The main research performing groups in Ireland are the enterprise and higher education sectors. The enterprise sector accounted for 67% of total gross expenditure on research and development in 2008 with an estimated total spend of €1,800m. The R&D intensity of the Irish enterprise sector which is estimated at 0.96% for 2008 is substantially lower than the average EU-27 figure of 1.17%. Much of the R&D carried out by the enterprise sector is performed by the Irish subsidiaries of multinational companies though expenditure on R&D by indigenous enterprises is increasing. Eurostat data for 2006 indicate that 9.6% of the funding for business expenditure on R&D came from abroad.

The higher education sector is also a major performer of research; in 2006, the higher education institutes undertook research activities to a value of €600m of which €514m was provided by the Government. Funding for research in the higher education sector is derived from a number of sources. These include the block grant, the Programme for Research in Third Level Institutions and the research funding programmes administered by Science Foundation Ireland.

Ireland, unlike major EU Member States, does not have a large public research sector. Total research expenditure by public research institutes in Ireland amounted to €141m in 2007 of which Teagasc, the agriculture and food development authority, accounted for over 50%.

## **2.2 Summary of strengths and weaknesses of the research system**

The analysis in this section is based on the ERAWATCH Analytical Country Reports 2008 which characterised and assessed the performance of the national research systems. In order to do so, the system analysis focused on key processes relevant for system performance. Four policy-relevant domains of the research system have been distinguished, namely resource mobilisation, knowledge demand, knowledge production and knowledge circulation. The analysis within each domain has been guided by a set of generic "challenges", common to all research systems, which reflect possible bottlenecks, system failures and market failures a research system has to cope with. The Analytical Country Report for the specific country can be found in the [ERAWATCH web site](#).

Policy attention in relation to the Irish research system is of relatively recent origin; the first policy paper in this area was the White Paper on Science and Technology in 1996. Since then the Government has successively increased expenditure on research and development in each of the three National Development Plans culminating in the allocation of €8.2b for science, technology and innovation in the current National Development Plan 2007–2013.

Though the Government has set as a mission statement that Ireland by 2013 will be internationally renowned for the excellence of its research, and will be to the forefront in generating and using new knowledge for economic and social progress, within an innovation driven culture, the reality is that Ireland in terms of its national research infrastructure is playing catch-up with larger EU Member States. Ireland lacks some of the institutional elements found in other countries such as specialist/sector-specific research institutes and dedicated technology agencies which often play a crucial intermediation role between knowledge producers and knowledge users.

The Government faces a number of challenges arising from Ireland's recently developed research system. The first is to continue to build a research infrastructure based on researcher quality and to address remaining infrastructural weaknesses.

The SSTI set ambitious targets for increasing the number of science, engineering and technology-related PhDs and achieving this target will require significant resource inputs.

The second challenge is to encourage the enterprise sector to increase its R&D performance in the context that 70% of BERD in Ireland is undertaken by affiliates of multinational companies. The amount of research carried out by indigenous enterprises is increasing but is concentrated in a small number of sectors such as software. Studies have indicated that indigenous enterprises have both poor linkages with the higher education sector and poor technology absorptive capacity.

Increasing the linkages between the main knowledge producers, the higher education sector, and industry is also a task that the Government is seeking to address. A number of measures such as the Industry Led Research Network Programme and the Competence Centres initiative have been implemented to encourage greater connection and collaboration between enterprises and higher education institutions.

**Table 1: Summary assessment of strengths and weaknesses of the national research system**

Domain	Challenge	Assessment of strengths and weaknesses
Resource mobilisation	Justifying resource provision for research activities	Long term government commitment to increasing expenditure on R&D
	Securing long term investment in research	Expenditure on R&D by public sector has increased since 1996 Growth in business expenditure on R&D is tapering off
	Dealing with barriers to private R&D investment	Development of new initiatives to encourage applied research
	Providing qualified human resources	Commitment to develop fourth level education (the provision of advanced post-graduate study and development education)
Knowledge demand	Identifying the drivers of knowledge demand	Evidence of "joined up" approach within government to science, technology and innovation policies
	Co-ordination and channelling knowledge demands	New oversight and review structures have been developed and are being put in place
	Monitoring of demand fulfilment	New initiatives to stimulate demand among industry for knowledge generated by higher education and public research sectors
Knowledge production	Ensuring quality and excellence of knowledge production	Continuation of strategy to establish a quality research base by supporting excellence, as measured by international peer review
	Ensuring exploitability of knowledge	New support measures to increase the absorption capacity of indigenous SMEs
Knowledge circulation	Facilitating circulation between university, PRO and business sectors	New initiatives to facilitate higher education-industry linkages Lack of a dedicated technology transfer agency as recommended by the Enterprise Strategy Group
	Profiting from international knowledge	Declining number of Irish private sector participants in Framework Programmes Lack of a strategic approach to Ireland's international research engagement
	Enhancing absorptive capacity of knowledge users	Strategic focus on enhancing human capital to increase knowledge users' absorptive capacity

### 2.3 Analysis of recent policy changes since 2008

The contribution of research and research policies to Lisbon goals (as well as to other societal objectives) goes beyond the fostering of R&D investment. It is therefore important to also analyse how other remaining shortcomings or weaknesses of the research system are addressed by the research policy mix. The focus of the section is on the analysis of main recent policy changes which may have a relevant impact on the four policy-related domains.

In December 2008, the Government in response to the rapidly deteriorating public finances, published a new policy framework document, *Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal*. The document sets out the Government's vision for the next phase of Ireland's economic development and seeks to address the problems of restoring stability both to the public finances and to Ireland's competitiveness.

Key elements of the framework document include investing in research and development, encouraging multinational companies to locate more R&D capacity in

Ireland and ensuring the commercialisation and retention of ideas that flow from this investment.

A dominant theme running through the document is the notion of developing Ireland as a Smart Economy i.e. building the innovation or 'ideas' component of the economy through the utilisation of human capital — the knowledge, skills and creativity of people — and its ability and effectiveness in translating ideas into valuable processes, products and services.

The Smart Economy plan also puts forward the goal of making Ireland a global hub for knowledge, innovation and know-how.

### 2.3.1 Resource mobilisation

The *Irish National Reform Programme 2008-2010* document reiterates the goal of the Strategy for Science, Technology and Innovation 2006-2013 to increase gross expenditure on research and development to 2.5% of GNP by 2013. The document states that the Government anticipates that GERD will reach 1.9% of GNP by 2010.

In January 2009, the Government announced funding for the fifth cycle of the Programme for Research In Third Level Institutions. A total of €300m will be allocated over the period 2009–2013 for enhancing the capacity and capability of the higher education sector to carry out research in areas of strategic national importance.

#### **Changes in National Reform Programme regarding the role of research in the broader economic growth strategy**

The [Irish National Reform Programme 2008-2010](#) was published in November 2008 following extensive consultation with the social partners (employers and trade unions) and with relevant stakeholders.

The document details the Government's strategy in line with the 2006–2008 priorities identified by the Spring European Council, particularly with regard to investing in knowledge and innovation. The main elements of the strategy include: Investing in Research & Development and innovation to build a knowledge-based economy; Providing a positive climate for entrepreneurship and start-up companies, and supporting export-led growth; Improving skill levels throughout the workforce and helping those who lose their jobs back into employment or training; Increasing energy efficiency and moving towards a low carbon economy.

The Programme states that Ireland will continue to make progress towards the Lisbon R&D target and despite the tougher global conditions the Government anticipates that Gross Expenditure on R&D (GERD) will reach 1.9% of GNP (1.6% of GDP) in 2010, up from 1.32% of GNP in 2000 and 1.56% of GNP in 2006. Ireland's total R&D spending grew to an estimated €2.5b during 2007. The goal of the Strategy for Science, Technology and Innovation 2006–2013 is that enhanced performance in business, higher education and public sector R&D should result in GERD increasing to 2.5% of GNP by 2013.

In its 2009 Budget the Government announced enhancements to the R&D tax credit which is viewed as a key incentive to attract multinational R&D investment in Ireland. One of the main changes to the tax credit is that the rate increased from 20% to 25%.

The Building Ireland's Smart Economy document states that up to €500m will be generated over the period 2009–2013 to create a venture fund, known as 'Innovation Fund – Ireland', to support early stage R&D-intensive SMEs.

The Government has welcomed the decision by two of Ireland's largest higher education institutions, University College Dublin (UCD) and Trinity College Dublin (TCD), to establish an Innovation Alliance which will have two main components:

- The TCD/UCD Joint Venture in Enterprise Development will build on the universities' existing technology transfer operations and enterprise facilities. It will include new facilities for pre-competitive research and design, prototyping and process innovation;
- The new 4th level TCD/UCD Innovation Academy will begin the process of defining and mainstreaming innovation as the third arm of the university mission alongside education and research. The Innovation Academy will focus particularly on 4th level PhD training, positioning innovation centre-stage in their courses, facilitating student mobility between campuses, and ensuring that expertise and resources at UCD and TCD are available to the business sector.

The cost of implementing the TCD/UCD innovation Alliance is estimated at €650m over ten years and will be drawn from a combination of sources, including existing and planned Government sources, such as the Strategy for Science, Technology and Innovation 2006-2013, and industry and private funding

**Table 2: Main policy changes in the resource mobilisation domain**

Challenges	Main policy changes
Justifying resource provision for research activities	<ul style="list-style-type: none"> <li>• Irish National Reform Programme endorses research target of 2.5% of GNP by 2013</li> </ul>
Securing long term investments in research	<ul style="list-style-type: none"> <li>• €300m is provided for the fifth cycle of the Programme for Research in Third Level Institutions</li> </ul>
Dealing with uncertain returns and other barriers to business R&D investments	<ul style="list-style-type: none"> <li>• Enhancements are made to the R&amp;D tax credit</li> <li>• New €500m fund for early stage R&amp;D-intensive SMEs</li> </ul>
Providing qualified human resources	<ul style="list-style-type: none"> <li>• Establishment of a new Innovation Academy by University College Dublin and Trinity College Dublin which will focus on fourth level PhD training.</li> </ul>

### 2.3.2 Knowledge demand

As noted in Section 2.1 above, two new committees have been established within Ireland's science and technology governance infrastructure. They are (a) the Enterprise Feedback Group, which was established by the Minister for Enterprise, Trade and Employment, to provide feedback from business and industry on the SSTI and advice on the commercialisation of research outcomes from the Government's investment in R&D and (b) the Health Research Group (HRG) has been established under the auspices of the Inter-Departmental Committee on Science, Technology and Innovation. The setting up of the HRG had been a recommendation in the Advisory Science Council's report, Towards Better Health: Achieving a Step Change in Health Research in Ireland.

A report, Ireland's International Engagement in Science, Technology and Innovation, published by the Advisory Science Council makes a number of recommendations in relation to governance and coordination. It proposes that the [Inter-Departmental](#)

[Committee for STI](#) should be the formal channel through which Ireland’s involvement in all significant partnerships and agreements is discussed, evaluated and, where appropriate, brought to the Cabinet Sub-Committee on STI for decision. The report also advises that a small international STI policy coordination unit be established to act as a source of expertise to Government Departments, agencies and other actors in relation to international STI linkages and to advise on issues such as the appropriate arrangements to be put in place to regularly evaluate the costs and benefits arising from Ireland’s international STI activities and to share good practice in evaluation methodologies across Government Departments and agencies.

**Table 3: Main policy changes in the knowledge demand domain**

Challenges	Main policy changes
Identifying the drivers of knowledge demand	<ul style="list-style-type: none"> <li>No changes.</li> </ul>
Co-ordinating and channelling knowledge demands	<ul style="list-style-type: none"> <li>Establishment of the Enterprise Feedback Group and the Health Research Group</li> </ul>
Monitoring demand fulfilment	<ul style="list-style-type: none"> <li>The Advisory Science Council recommends the establishment of a international STI policy coordination unit to monitor Ireland’s international STI engagement</li> </ul>

### 2.3.3 Knowledge production

The National Reform Programme 2008-2010 document notes that the Government intends to develop in 2009 a new national strategy for the higher education sector. The process for developing the new strategy will give consideration, inter alia, of the development of higher education institutions as world leaders in R&D.

The Government’s strategy framework document, Building Ireland’s Smart Economy, indicates an action plan will be developed for expanding research and development in converging technologies combining Ireland’s science-based strengths with enterprise capacity. The document states that the launch of an Action Plan for health research is scheduled for June 2009.

The document also notes that as Ireland has a relatively large number of universities, the proposed higher education strategy would focus on the need for rationalisation and re-configuration of roles across the higher education sector. The strategy would also address the challenges of both enhancing research performance and improving effectiveness and quality across the wider remit for teaching and learning.

**Table 4: Main policy changes in the knowledge production domain**

Challenges	Main policy changes
Improving quality and excellence of knowledge production	<ul style="list-style-type: none"> <li>Building Ireland’s Smart Economy notes the need to re-configure the Irish higher education sector so as to advance research innovation</li> </ul>
Ensuring exploitability of knowledge production	<ul style="list-style-type: none"> <li>The new TCD/UCD Innovation Alliance seeks to enhance the universities’ existing technology transfer operations and enterprise facilities</li> </ul>

### 2.3.4 Knowledge circulation

The Advisory Science Council produced two reports in 2008 which considered issues relating to the knowledge circulation domain. The first report, *Towards a Framework for Researcher Careers*, made a number of recommendations on researcher mobility,

particularly in relation to the importance of facilitating movement between the higher education and enterprise sectors.

The second report examined Ireland's international engagement in science, technology and innovation. The document emphasised the need for Ireland to use its international networks in a strategic way to help achieve the targets set out in the Strategy for Science, Technology and Innovation 2006-2013. It recommended that a new international STI policy coordination unit be established to act as a source of expertise to government departments, agencies, enterprise representative groups and other actors in relation to international STI linkages.

The report also highlighted the wide array of opportunities available in Europe and elsewhere and stressed the need for all STI actors, including funding organisations, to think strategically about these opportunities and the changes they may need to make to have policies and programmes that are firmly embedded in the wider international system.

As noted above, UCD and TCD have announced an Innovation Alliance which aims to enhance the universities' technology transfer capabilities and enterprise support facilities. The Alliance has been backed by the Government which believes the merging of science and technology research functions in Ireland's two largest universities will give the third-level system the critical mass it has lacked.

**Table 5: Main policy changes in the knowledge circulation domain**

Challenges	Main policy changes
Facilitating knowledge circulation between university, PRO and business sectors	<ul style="list-style-type: none"> <li>• Advisory Science Council recommends the development of an appropriate career structure for researchers to facilitate the mobility between the higher education and enterprise sectors</li> <li>• The Government anticipates that the new TCD/UCD Innovation Alliance will enhance the universities' existing technology transfer operations and enterprise facilities</li> </ul>
Profiting from access to international knowledge	<ul style="list-style-type: none"> <li>• New report from the Advisory Science Council recommends the establishment of a new international unit to assist in the development of strategic STI linkages</li> </ul>
Absorptive capacity of knowledge users	<ul style="list-style-type: none"> <li>• No changes.</li> </ul>

## ***2.4 Policy opportunities and risks related to knowledge demand and knowledge production: an assessment***

Following the analysis in the previous section, this section assesses whether the recent policy changes respond to identified system weaknesses and take into account identified strengths.

The Government in the 2009 Budget indicated that it was significantly enhancing the R&D tax credit which was first introduced in 2004. The changes include increasing the rate of tax credit for R&D expenditure from 20% to 25% and allowing for the carry-back of unused tax credits for set-off against corporation tax paid the previous year and to allow for any remaining unused tax credit to be refunded over a three year period. The new enhancements also allow for a proportion of the expenditure on new or refurbished buildings to be used in part for R&D purposes to qualify for the tax credit; this recognises that much R&D activity actually takes place outside traditional laboratories. The Government anticipates that the new enhancements to the R&D tax credit will cost €60m in a full year.

The Government anticipates that the enhanced tax credit will be a major marketing tool for attracting multinational companies to locate R&D projects in Ireland and for incentivising existing indigenous R&D performing enterprises to increase their expenditure on R&D (See Section 3.3.2 below). Data provided by IDA Ireland, the State agency responsible for the promotion of inward investment, indicate that 40% of the FDI projects secured in 2007 were R&D related.

The new strategy framework document, Building Ireland's Smart Economy, indicates the Government's intention to develop revised arrangements for the taxation of intellectual property during 2009. The Government says it is committed to reforming the corporate tax regime in this area with particular emphasis on a tax deduction for trading companies for capital expenditure on intangible assets and a unilateral credit relief for all trading companies.

**Table 6: Summary of main policy related opportunities and risks**

Domain	Main policy opportunities	Main policy-related risks
Resource mobilisation	Opportunity to position Ireland as an attractive location for FDI R&D projects	Difficult economic climate may depress the number of FDI R&D projects
Knowledge demand	New governance structures to underpin a more strategic approach to Ireland's international STI linkages	Insufficient integration between research and innovation policies
Knowledge production	Potential for third level institutions to merge to gain critical research mass	Small scale of Irish third level institutions and weak linkages with enterprise sector
Knowledge circulation	Provision of 4 <sup>th</sup> level education programmes to develop post-graduates with research and enterprise-relevant skills	Lack of a dedicated technology transfer agency may hinder the circulation of knowledge from the publicly-funded research sector to the enterprise sector

### 3 National policy mixes towards R&D investment goals

The aim of this chapter is to deepen the analysis of national policy mixes with a focus on public and in particular **private R&D investment**. The Lisbon strategy emphasises an EU overall **resource mobilisation objective** for 2010 of 3% of GDP of which two thirds should come from private investment. R&D investment is seen as important yardstick for the capacity of an economy to turn the results of science and research into the commercially viable production of goods and services and hence knowledge into growth. Corresponding investment policies are mainly pursued at national level and determined with a national focus.

The chapter is structured around five questions:

1. What are the specific barriers in the country that prevent reaching the Lisbon goal? What barriers exist in the country to prevent reaching the specific targets, particularly related to the private sector R&D investments?
2. Given the above, what are the policy objectives and goals of the government that aim to tackle these barriers?
3. What Policy Mix routes are chosen to address the barriers and which specific instruments and programmes are in operation to implement these policies?
4. What have been the achievements in reaching the above-mentioned R&D investment objectives and goals?

## 5. What are the reasons for not reaching the objectives, adaptation of the goals?

The chapter aims to capture the main dimensions of the national policies with an emphasis on private R&D investment. The chosen perspective of looking at investments in R&D is the concept of Policy Mixes. The analysis and assessment follows a stepwise approach following the five questions mentioned above.

### ***3.1 Barriers in the research system for the achievement of R&D investment objectives***

The overall thrust of Irish policy focus is to increase and improve the levels of activity in research and development in the public and private sectors and to facilitate greater levels of creativity and innovation.

There are, however, a number of barriers in the Irish research system which impact on the achievement of R&D investment goals, particularly within the private sector, many of which stem from structural-related factors.

The enterprise sector in Ireland comprises two distinct segments:

1. The high technology multinational sector which includes large companies such as Intel, Microsoft and Pfizer;
2. The indigenous sector which consists largely of small and medium sized enterprise in a variety of high and low technology sectors ranging from software to food processing.

The multinational sector accounts for approximately 70% of gross expenditure on research and development in Ireland.

Ireland's low corporation profits tax is a major reason behind these companies' decision to locate in this country while Ireland's membership of the EU is another important factor. The majority of multinational manufacturing companies in Ireland only have a manufacturing base here but some have opened R&D facilities. IDA Ireland, the agency charged with attracting foreign direct investment, is seeking to win a greater share of mobile FDI R&D projects to Ireland. The decision by multinational companies to invest R&D projects in Ireland is taken at corporate headquarters level but is influenced to some extent by Irish policy levers such as the low corporation profits tax rate and the availability of R&D tax credits.

Expenditure by indigenous enterprises on research and development has been increasing steadily in the last decade albeit from a small base. Research by Forfás indicates that one sector, the software/computer-related sector, accounts for a large proportion of R&D expenditure by indigenous enterprises. The base of indigenous enterprises that is actively engaged in R&D represents a small percentage of the total population of enterprises.

One of the structural weaknesses of the Irish research system is the lack of specialised or industry-specific research organisations and a dedicated technology agency that could work with small and medium sized enterprises to help them develop their technical capacity. Additionally, the absence of such intermediary research organisations in Ireland impacts in terms of a scarcity of information channels for enterprises on market/customer trends i.e. the "pull" side of STI. The lack of such research organisations/agencies in Ireland means that the higher education institutions have to undertake this role in addition to their primary teaching and research functions.

A study published by Forfás, Making Technological Knowledge Work, has indicated that the SME sector has little absorptive capacity to internalise the knowledge developed in the higher education or public research sectors.

### **3.2 Policy objectives addressing R&D investment and barriers**

The key elements of the approach to strengthen research and innovation in the enterprise sector outlined in the Strategy for Science, Technology and Innovation 2006-2013 (SSTI) include:

- (i) raising awareness and increasing the number of enterprises doing R&D;
- (ii) improving soft supports to develop technology strategies in enterprises;
- (iii) achieving step increases in quality and quantity of R&D activity;
- (iv) building in-company technology capability;
- (v) increasing inter-enterprise and industry-higher education institution collaboration;
- (vi) simplifying the administrative and operational procedures of programmes.

The Government's policy framework document, Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal (December 2008), highlights that one of Ireland's four key strategic priorities is to invest heavily in research and development, incentivise multinational companies to locate more R&D capacity in Ireland, and ensure the commercialisation and retention of ideas that flow from that investment.

An important theme underpinning the document is the notion of developing Ireland as a Smart Economy i.e. building the innovation or 'ideas' component of the economy through the utilisation of human capital — the knowledge, skills and creativity of people — and its ability and effectiveness in translating ideas into valuable processes, products and services.

The Government envisages that at the core of the proposed Smart Economy will be an exemplary research, innovation and commercialisation ecosystem. The framework document seeks to promote Ireland as an innovation and commercialisation hub in Europe — a country that combines the features of an attractive home for innovative R&D-intensive multinationals while also being a highly-attractive incubation environment for entrepreneurs.

The Government has indicated in the new Ireland National Reform Programme 2008-2010 document that it is preparing a new strategy on the knowledge society. The proposed strategy will continue to prioritise investments associated with the deepening of capacity for the knowledge economy, especially in respect of research and development which is central to the SSTI. No details have yet emerged on the allocation of resources or time-scales of the proposed knowledge society strategy.

### **3.3 Characteristics of the policy mix to foster R&D investment**

This section is about the characterisation and governance of the national policy and instrument mix chosen to foster public and private R&D investment. While policy goals are often stated at a general level, the policy mix has a focus on how these policy goals are implemented in practice. The question is what tools and instruments

have been set up and are in operation to achieve the policy goals? The following sections will each try to tackle a number of these dimensions.

### 3.3.1 Overall funding mechanisms

Figures produced by Eurostat indicate that Gross Expenditure on Research and Development (GERD) in Ireland rose from €2.03b in 2005 to €2.7b in 2008. R&D intensity in Ireland (GERD as a percentage of GDP) increased from 1.25% in 2005 to 1.44% in 2008.

Irish business expenditure on R&D increased from €1.33b in 2005 to €1.8b in 2008. Business sector R&D intensity (BERD as a % of GDP) stood at 0.96% in 2008; this was below the average for the EU-27 for 2007 of 1.17%.

**Table 7: Irish R&D investment indicators**

	2005	2006	2007	2008	EU-27 (latest year)	
					Average	Year
<b>GERD (euro million)</b>	2030	2311	2501	2688	226120	2007
<b>R&amp;D intensity (GERD as % of GDP)</b>	1.25	1.30	1.31	1.44	1.83	2007
<b>GERD financed by government as % of total GERD</b>	32.0	30.1	na	na	34.2	2005
<b>GERD financed by business enterprise as % of total GERD</b>	57.4	59.3	na	na	54.5	2005
<b>GERD financed by abroad as % of total GERD</b>	8.6	8.9	na	na	9.0	2005
<b>GBAORD (euro million)</b>	797	858	995	na	87639	2007
<b>GBAORD as % of general government expenditure</b>	1.46	1.43	1.47	na	1.55	2007
<b>BERD (euro million)</b>	1330	1560	1670	1800	144089	2007
<b>Business sector R&amp;D intensity (BERD as % of GDP)</b>	0.82	0.88	0.88	0.96	1.17	2007
<b>BERD financed by government as % of total BERD</b>	4.1	3.8	na	na	7.2	2005

Source: Eurostat<sup>3</sup>

Other Eurostat data indicate that the largest source of R&D funding in Ireland is the Business enterprise sector. In 2006, the business enterprise sector provided €1,370m for R&D funding of which €1,350m was performed by enterprises with the balance (€20m) being accounted for by the higher education sector (€11m) and the public research sector (€8m).

The Government sector was the next largest contributor of R&D funds. In 2006, the Government provided €696m for research of which €514m (74%) was undertaken by the higher education sector and €122m (18%) was undertaken by the public research sector. A total of €60m (8%) of Government funding for R&D was performed by the business sector. The private non-profit sector (including philanthropy sources) contributed €27m of the research performed by the higher education sector and €7m of research undertaken by the public research sector. International sources such as the EU provided a total of €206m in funding to Irish researchers; €150m (73%) of R&D funding undertaken by the business sector was sourced from abroad while the respective amounts for the higher education and government sectors were €43.2m (21%) and €12.8m (6%).

<sup>3</sup> Note: Values in italics are estimated or provisional. na = not available.

An analysis of Government funding for research and development in the higher education and Government sectors in 2006 indicates that out of the total of €633m, approximately 40% was distributed to the higher education institutions by way of the block or core grant. Competitive research funding sources directed at the higher education sector such as the Programme for Research In Third Level Colleges (PRTL)<sup>4</sup> and Science Foundation Ireland grants contributed €29m and €108m respectively.

The two Research Councils collectively provided €21m in funding for research while Enterprise Ireland provided €35m for research in the higher education and government sectors. A mixture of Government ministries and agencies such as the Health Research Board provided the remainder of the funding.

A further €73m of Government funding supported research performed by the enterprise sector. EU investment in Irish R&D amounted to approximately €84m.

### 3.3.2 Policy Mix Routes

The “Policy Mix Project” identified the following six ‘routes’ to stimulate R&D investment:

1. promoting the establishment of new indigenous R&D performing firms;
2. stimulating greater R&D investment in R&D performing firms;
3. stimulating firms that do not perform R&D yet;
4. attracting R&D-performing firms from abroad;
5. increasing extramural R&D carried out in cooperation with the public sector or other firms;
6. increasing R&D in the public sector.

The routes cover the major ways of increasing public and private R&D expenditures in a country. Each route is associated with a different target group, though there are overlaps across routes. The routes are not mutually exclusive as, for example, competitiveness poles of cluster strategies aim to act on several routes at a time. Within one ‘route’, the policy portfolio varies from country to country and region to region depending to policy traditions, specific needs of the system, etc.

#### **Route 1: Promoting the establishment of new indigenous R&D performing firms**

The Government’s new strategy framework document, Building Ireland’s Smart Economy, indicates that a more favourable tax treatment of the carried interest of venture capital will be introduced to encourage the availability of ‘smart capital’ for investing in start-up innovative companies.

Facilitating access to finance, particularly with regard to SMEs is a priority for Enterprise Ireland, the State agency for the promotion of indigenous industry. To this end, the proactive use of state aid instruments to promote such finance, through interventions such as the Business Expansion Scheme, Seed Capital Scheme, R&D credits and the seeding of the Venture Capital industry in Ireland are key responses. Enterprise Ireland also supports Business Angel structures in conjunction with other

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<sup>4</sup> Care should be taken in interpreting PRTL expenditure figures as it is a multi-annual funding programme and disbursements can vary significantly from year to year.

relevant agencies in Ireland, and has a certification role in relation to eligibility for Business Expansion Scheme Support. A number of taxation-based instruments (Business Expansion Scheme, Seed Capital, R&D credits) are available to underpin investments in enterprise.

A dedicated Business Unit within Enterprise Ireland focuses on high potential start up (HPSU) enterprises which are defined as a business that is manufacturing an export focused product or offering an internationally tradable service; based on a technical advantage or a pioneering or innovative idea; likely to achieve annual sales of €1m; and employ 10 or more within three years of start-up; and headquartered or controlled in Ireland. The HPSU Business Unit provides a full range of start-up support services including finance, management support, R&D and market development.

Enterprise Ireland's Campus Incubation initiative offers space and support to entrepreneurs who want to develop their projects within the supportive structure of a college campus.

### **Route 2: Stimulating greater R&D investment in R&D performing firms**

Incentivising existing R&D performers to increase their investment in R&D is a key Government objective. In December 2008, the Government announced that up to €500m will be generated to create a venture fund, known as 'Innovation Fund – Ireland', to support early stage R&D-intensive small and medium sized enterprises. The capital is to be divided into five venture funds of between €75-150m. The new fund will be operated in coordination with existing financial supports from Enterprise Ireland for early stage R&D intensive SMEs, in order to ensure efficient allocation of resources and avoid overlapping supports.

The main support provided by Enterprise Ireland under this policy mix route heading is the R&D Fund which is designed to provide support for research, development and technological innovation relevant at all stages of company development, and which seeks to facilitate companies to progress from undertaking an initial research project to high-level innovation and R&D activity. The maximum R&D grant that is available to all Irish-based manufacturing and internationally traded service companies under the R&D Fund initiative is €650,000.

Training programmes to enhance innovation and R&D skills in R&D performing companies is available under Enterprise Ireland's Innovation Management initiative.

R&D performing enterprises are eligible for a tax credit on their incremental expenditure on research; the Government increased the rate from 20% to 25% in the 2009 Budget.

### **Route 3: Stimulating firms that do not perform R&D yet**

Enterprise Ireland has put in a place a number of supports to stimulate indigenous companies that are not currently engaged in research and development. The new Innovation Voucher initiative is directly aimed at non-R&D performing companies and is designed to build links between Ireland's public knowledge providers and small businesses and create a cultural shift in the small business community's approach to innovation. Funding of up to €5,000 is provided to allow SMEs to access the skills and research expertise in third level institutions.

Other Enterprise Ireland supports include the R&D Stimulation Grant and the R&D Funding for Small Projects initiative. The objective of the R&D Stimulation Grant is to

encourage companies, that have not carried out R&D in the past or that have done so only on a sporadic basis, to develop the establishment of a sustainable R&D activity. The R&D Funding for Small Projects initiative is a provision under the R&D Fund to support product, process or service project R&D where the expenditure amount is less than €150,000.

Enterprise Ireland's Innovation Management initiative provides introductory training for enterprises becoming involved in R&D for the first time.

Additionally, another Enterprise Ireland support, the R&D Advocate initiative, is used to create awareness among enterprises and actively engage them in R&D for the first time.

#### **Route 4: Attracting R&D-performing firms from abroad**

The National Reform Programme: Ireland 2008-2010 document highlights the slow-down in the economy due to declining construction output compounded by the severe international financial crisis. It says that this creates serious economic and fiscal challenges for the Irish Government and is already being reflected in increased unemployment. The document notes the Government's determination to harvest the downstream benefits of its much-expanded expenditure on R&D for wealth creation and economic and social well-being and in this regard points out that the fiscal environment for research and development will be significantly improved in 2009 in terms of increased tax credits for R&D.

The Government has introduced a number of measures to incentivise multinational companies to invest R&D projects in Ireland. In 2004, the Government introduced a 20% tax credit for companies engaging in incremental R&D activities in order to enhance Ireland's competitiveness as a location for new internationally mobile research-related investment, and to encourage existing indigenous and overseas firms to add research functions to their operations in Ireland or to increase their level of research activity. The 2009 Budget contained a number of measures designed to support enterprise and innovation, while improving competitiveness; one such measure is that the current 20% rate of tax credit for a company on qualifying research and development (R&D) expenditure was increased to 25%. Prior to the changes, US companies had argued that due to the low Irish corporation profits tax (12.5%), the benefit of a tax credit was diluted when compared to other countries.

The Government has estimated the cost of the improvements to the R&D tax credit at €60m in a full year.

The enhanced supports announced in the Budget complement the promotional activities of the IDA, the national agency responsible for attracting FDI projects to Ireland.

#### **Route 5: Increasing extramural R&D carried out in cooperation with the public sector**

The Government emphasises the need for greater linkages between the public sector (and particularly, the higher education sector) and the enterprise sector. A number of new initiatives have been developed to foster such linkages.

One such initiative is Enterprise Ireland's Industry Led Research Networks Programme which facilitates groups of companies to form a network and to develop an agreed research agenda that is then used as a call for research provision to be performed by a suitable research performing organisation. The research is

undertaken in close collaboration with the companies to ensure its relevance and to build and sustain strong links between the participants.

The Competence Centre initiative is another new offering from Enterprise Ireland and IDA Ireland which funds the development of collaborative entities led by industry but resourced by highly-qualified researchers associated with research institutions who undertake market focused strategic R&D. The Competence Centre initiative aims to achieve competitive advantage for industry by accessing the innovative capacity of the research community. Funding up to €2m can be provided to Competence Centres over a period of 5 years. The initiative was modelled on best practice enterprise-public research programmes operating in Sweden and Austria.

Both the Industry Led Research Networks Programme and the Competence Centre initiatives are designed to deliver pre-competitive strategic research activity on a research agenda set by the industry partners, which is to be used as background to open up wider opportunities for the enterprise sector. Both are intended to engage with numbers of companies, enabling the companies to work together and drive collaboration. Enterprise Ireland anticipates that projects funded under the Industry-Led Research Networks Programme will progress to form Competence Centres.

Though research funding provided by Science Foundation Ireland is primarily directed at researchers in third level institutions, it provides financial assistance to facilitate higher education-enterprise linkages under its [Centres for Science, Engineering and Technology](#) (CSETs) and [Strategic Research Clusters](#) initiatives.

### **Route 6: Increasing R&D in the public sector**

Data produced by Forfás indicates that Government budget appropriations or outlays on R&D metric (GBAORD) which as a result of the rapid increase in State funding for R&D has, as a percentage of GNP, increased from 0.35% in 1998 to an expected 0.63% in 2008. Between 2003 and 2008, Ireland exhibited the fast growth rates in civil GBAORD (excluding spending on defence) in the OECD.

The Government provides funding to the higher education sector through a variety of mechanisms including the direct block or core grant and competitive funding initiatives such as the Programme for Research in Third Level Institutions (PRTL), the Strategic Innovation Fund and the funding programmes of Science Foundation Ireland.

These three competitive funding initiatives are complementary in that PRTL and SIF funding is primarily directed at developing the research capacity of the higher education sector while SFI funding is targeted at HEI researchers and research teams. In recent years, the focus of SFI has changed funding basic research projects only to funding an increasing proportion of applied research projects involving industrial partners.

The Government announced in January 2009 the provision of €300m in funding for Cycle 5 of the PRTL covering the period 2009-2013. The PRTL funding will be targeted in four areas: capital facilities; national shared facilities; structured PhD programmes; and research in new and emerging areas.

The remit of Science Foundation Ireland (SFI) was amended during 2008 to add a third research pillar on sustainable energy and energy-efficient technologies to its existing strategic areas of scientific endeavour in the areas of ICT and biotechnology. This will involve the provision of a research capacity investment through SFI of €90m in sustainable energy and energy-efficient technologies over the period 2008-2013.

## **The importance of education and innovation policies**

The development of a pool of talented researchers has been a key policy goal of Irish research policies contributing to the Government's ambition to position Ireland as a leading knowledge economy. The importance of education policies also has to be seen in the context that Ireland is catching up with the larger EU Member States with respect to its national research and innovation system; for example, it lacks the specialist or industry-specific public research organisations and dedicated technology agencies that are found in other European countries. The Irish higher education sector is required to undertake additional roles in addition to its primary roles of teaching and research such as assisting the transfer of technologies to the enterprise sector.

Increasingly, the focus of research funding directed at the higher education sector is on developing linkages with the enterprise sector through networks and competence centres. The formation of linkages between the two sectors reflects the importance that the Government attaches to commercialisation by industry of research and ideas generated in the higher education institutions as a result of the significant — by Irish standards levels — of PRTL I and SFI funding.

The Government continues to use other policies such as fiscal policies to stimulate research. The Budget 2009 announced an increase in the Irish R&D tax credit from 20% to 25%. The R&D tax credit is perceived as a key incentive for attracting mobile R&D investment projects to Ireland while simultaneously stimulating indigenous companies to increase their research expenditures.

Both the National Reform Programme 2008-2010 and the Building Ireland's Smart Economy documents highlight the potential role of services innovation and research as a stimulant for future economic growth. The Government's services strategy, *Catching the Wave*, seeks to facilitate the establishment of industry-led competence centres to stimulate research in services. Data published by Forfás indicate that Irish service firms spent €1.9b on innovation in 2006.

## **Assessment of the importance of policy mix routes and their balance**

All six policy mix routes are identified in Irish policy documents as being relevant in terms of achieving the objectives set out in the Strategy for Science, Technology and Innovation 2006-2013 (SSTI) and more recently in the Government's strategy framework document, *Building Ireland's Smart Economy* (December 2008). The limitations imposed by the lack of available data on the allocation of financial resources among the range of STI support measures means that it is difficult to be precise as to the relative weight attached to individual policy mix routes.

However, a number of general comments can be made. Firstly, the Government continues to place a major emphasis on developing the research capability of the higher education sector. In January 2009, the Government announced an allocation of €500m for the fifth cycle of the Programme for Research in Third Level Institutions (PRTL I). However, a major focus of Government investment in the higher education sector is in developing the human capital stock of researchers that can then transfer to the enterprise sector.

Recent indications also suggest that a greater percentage of the funding directed at the third level sector is aimed at facilitating inter-institutional collaboration and particularly developing linkages with the private sector. A total of €111m of the grants committed by Science Foundation Ireland in 2007 out of a total grant commitment of

€365m were for initiatives such as Strategic Research Clusters and Centres for Science, Engineering and Technology that foster higher education-industry linkages.

Enterprise Ireland is also providing financial support to foster research collaboration between the enterprise sector and the higher education institutions with its Industry Led Research Network Programme and Competence Centres initiatives.

The analysis of policy documents such as the National Reform Programme Ireland and the Building Ireland's Smart Economy indicate that current major policy focus is on routes 1, promoting the establishment of new indigenous R&D performing enterprises, and Route 2, stimulating existing R&D performing enterprises to do more.

Additionally, the analysis indicates that the fourth policy mix route, attracting R&D performing firms from abroad, has increased in importance. The Government has announced an enhancement of the existing R&D tax credit which it estimates will cost €90m in a full year. Ireland's substantial investment in building its research base along with its low corporation profits tax rate and enhanced R&D tax credit have now become important marketing tools for attracting FDI R&D projects to Ireland.

In terms of assessing policy mix balance, there is a need to develop additional applied research or close-to-market innovation support measures to complement the significant expenditures by the Government on basic research. Additional resources are required to develop structures which provide the national innovation system with market and end-user data on the demand for new products and services. The Government has announced the establishment of a new Innovation Task Force which will be responsible for developing the policy, legislative and infrastructural elements required to enable and support the establishment of the innovation ecosystem to internationally competitive standards.

The following Table provides an assessment of the importance of policy mix routes in Ireland and their balance.

**Table 8: Importance of routes in the national policy and recent changes**

Route	Short assessment of the importance of the route in the national policy	Main policy changes since 2008
1	Major policy focus: Raising awareness and increasing the number of enterprises undertaking R&D is an important national policy goal.	New tax incentives to facilitate the provision of venture capital to innovative start up enterprises
2	Major policy focus: The Strategy for Science, Technology and Innovation 2006–2013 (SSTI) sets key targets for increases in the number of R&D performing enterprises.	A new €500m fund will be established to create a venture fund to support early stage R&D-intensive SMEs
3	Minor policy focus: The SSTI also seeks to increase the number of enterprises undertaking research but there is no major new resource allocation for this policy route	No major change
4	Major policy focus: Attracting mobile FDI R&D projects has become a major national priority	Enhancement of existing R&D tax credit is announced in 2009 Budget
5	Medium policy focus: The development of enterprise-higher education research linkages is crucial to the commercialisation of knowledge generated by Ireland's substantial investment in basic research and this is reflected in recent increases in budget allocation	No major changes
6	Medium policy focus: Building the research capacity and capability of the higher research sector has been a major long term R&D policy goal	The Government announces funding of €300m for PRTL Cycle 5 covering the period 2009-2013

### **3.4 Progress towards national R&D investment targets**

The Irish National Reform Programme 2008–2010 document states that it is a goal of the Strategy for Science, Technology and Innovation 2006–2013 (SSTI) that enhanced performance in business, higher education and public sector R&D should result in gross expenditure on R&D increasing to 2.5% of GNP by 2013 (it is important to note that GNP is a better measure of economic activity in Ireland as it excludes the potentially distortional effect of large profit repatriations from multinational firms and other net foreign income flows from the total measure of activity (Gross Domestic Product)).

Recent preliminary statistics on Business Expenditure on R&D produced by Forfás and the Central Statistics Office (CSO) indicate that BERD has increased from €0.9b in 2001 to €1.6b in 2007 (it is anticipated that the 2008 figure for BERD will reach €1.7b). While the ratio of BERD to overall economic activity in Ireland has been steadily increasing, it is still well below the OECD average. The figures suggest that the strong growth in BERD that had been evident in the early part of the decade may be tapering off.

The preliminary BERD data show that while the numbers of researchers and other support staff working in enterprises increased between 2001 and 2007, the number of enterprises actively engaged in R&D declined over the same period.

The National Competitiveness Council (NCC) in its Annual Competitiveness Report 2008 indicates that despite a large increase in actual expenditure on R&D, Ireland has made limited progress towards the 2.5% target set by the SSTI. It notes that total R&D spending in Ireland increased from 1.26% of GNP in 2000 to 1.53% of GNP in 2006; this compares with an OECD average of 2.36% (2006).

The NCC report states that despite strong growth rates in expenditure, business R&D as a percentage of economic activity has remained relatively static over the past decade. With the emphasis in the last decade on developing the research infrastructure within the higher education sector, there is a danger that the business sector may not achieve the 2/3<sup>rd</sup> expenditure target set under Lisbon.

The current international climate does not augur well for Ireland's ambition to capture a greater share of FDI R&D projects, which is a principal element in the Government's strategy framework document, Building Ireland's Smart Economy.

Recent Government strategy documents indicate a trend towards a closer alignment between research and innovation policies and this is reflected in the emphasis within the policy mix formulation on routes leading to the creation of linkages between the higher education and enterprise sectors. Ireland has expended considerable sums developing a research infrastructure in the higher education sector and a critical challenge over the remaining lifetime of the Strategy for Science, Technology and Innovation 2006-2013 is the commercialisation by industry of the knowledge developed within the higher education institutions.

The Government's strategy framework document, Building Ireland's Smart Economy, also highlights the need to increase the numbers of enterprises becoming involved in research and incentivising existing R&D performing enterprises to do more.

**Table 9: Main barriers to R&D investments and respective policy opportunities and risks**

Barriers to R&D investment	Opportunities and Risks generated by the policy mix
Weak linkages between higher education and indigenous enterprise sectors	Opportunity to commercialise the knowledge created arising from Ireland's technology foresight investment programme in ICT and biotechnology Lack of regional balance in the implementation of the SSTI may further exacerbate existing regional R&D capacity weaknesses
Small base of indigenous R&D performing companies	Existing policies may not be sufficient to encourage enterprises who do not perform R&D to become involved in research
Lack of integrated research and innovation policies	Provision of revised and simplified structure of STI support initiatives have the potential to create better synergies between research and innovation
Lack of specialised or sector-specific research organisations and dedicated technology agency	There is a risk that the higher education institutions who are being asked to undertake a technology transfer role in addition to their primary teaching and research missions may not have the necessary attributes to do so

## 4 Contributions of national policies to the European Research Area

ERAWATCH country reports 2008 provide a succinct and concise analysis of the ERA dimension in the national R&D system of the country. This Chapter further develops this analysis and provides a more thorough discussion of the national contributions to the realisation of the European Research Area (ERA). An important background policy document for the definition of ERA policies is the Green paper on ERA<sup>5</sup> which comprises six policy dimensions, the so-called six pillars of ERA. Based on the Green Paper and complementing other ongoing studies and activities, this chapter investigates the main national policy activities contributing to the following four dimensions/pillars of ERA:

- Developing a European labour market of researchers facilitating mobility and promoting researcher careers
- Building world-class infrastructures accessible to research teams from across Europe and the world
- Modernising research organisations, in particular universities, with the aim to promote scientific excellence and effective knowledge sharing
- Opening up and co-ordination of national research programmes

In the ERA dimension, the *wider context of internationalization of R&D policies* is also an issue related to all ERA policy pillars and is normally present in the dynamics of national ERA-relevant policies in many countries.

<sup>5</sup> Commission of the European Communities: Green paper: The European Research Area: New perspectives. Brussels 4.4.2007, COM(2007) 161final (see [http://ec.europa.eu/research/era/pdf/era\\_gp\\_final\\_en.pdf](http://ec.europa.eu/research/era/pdf/era_gp_final_en.pdf)).

#### **4.1 Towards a European labour market for researchers**

The Irish Government attaches considerable importance to researcher mobility within the European Research Area. The issue of researcher careers — producing, retaining and attracting the appropriate quantity and quality of researchers to meet the needs of a knowledge-intensive economy — is a top priority for Ireland. Irish policy-makers believe that national and EU policies in this domain can operate in a highly complementary manner to improve the situation for researchers generally and specific groups identified in the Green Paper such as young researchers and women in science.

The Irish strategy document, [Strategy for Science, Technology and Innovation 2006–2013](#) (SSTI), envisages a doubling of researcher numbers over a 7-year period with a particular focus on ensuring a strong flow of researchers to the enterprise sector. The Strategy envisages that the number of PhD graduates in science, engineering and technology would grow from 543 in 2005 to 997 by 2013. Data from the Higher Education Authority indicate that the annual number of PhDs awarded in Ireland across all disciplines is expected to have topped the 1,000 mark for the first time in 2008 and marks good progress towards Ireland's goal to be a global centre for research. However, ensuring the achievement of the SSTI target implies that Ireland will have to attract researchers from overseas countries. A survey by the Advisory Science Council found that 40% of the researchers in research groups surveyed were non-nationals.

The SSTI document also places an emphasis on the quality of researcher training with a number of specific mechanisms in place (e.g. structured research teams comprising principal investigators, post-doctoral researchers and PhD students; significant investment in graduate schools to provide structured training at PhD level, etc.). There is also an emphasis in the national strategy regarding the need to develop the pipeline of researchers by taking initiatives as early as primary school level to foster and maintain curiosity and interest in the sciences.

##### **4.1.1 Policies for opening up the national labour market for researchers**

A study published by the Advisory Science Council in 2008 on Ireland's international STI engagement has found a strong international profile within existing research centres and R&D units in both the public and private sectors. More than 40 per cent of the 1,300 researchers employed within the research centres and enterprises covered by the study were non-Irish. Approximately two-thirds of the non-Irish were from elsewhere in Europe and one-third are from outside Europe altogether. In at least a quarter of the research groups consulted, there were more non-Irish researchers than there were Irish. In 60 per cent of the groups, at least a quarter of the researchers were from outside Ireland. The high level of overseas researchers identified by the study indicates that Ireland operates an open door policy for researchers.

Ireland implemented the Third Country Directive for Admission of Researchers (2007/71/EC) relating to the specific admission procedure for third-country nationals for the purpose of scientific research in October 2007 and announced arrangements in October 2007 to give effect to this Directive.

Under the new Directive admission procedure, researchers will be admitted to Ireland on the basis of a hosting agreement signed between an accredited research organisation and a researcher. The Hosting Agreement is a document containing a researcher's details and a short description of a research project to be conducted by

the researcher within the hosting institution. To keep the procedure simple there is no approval process or fee for hosting agreements. Researchers from visa-requiring countries make their visa application on the basis of their hosting agreements. Once a hosting agreement is in place, the researcher will be admitted into Ireland subject to normal immigration requirements.

The implementation of this Directive means that there is now a fast and administratively light procedure for accredited research organisations in Ireland (public and private) that allows them to recruit researchers from outside Europe for specific research contracts. Additionally, it will allow researchers to bring direct family members (spouses and children) to Ireland for the duration of the research contract.

The Researcher's Mobility Office within the Irish Universities' Association (IUA) plays a role in dissemination of information on the Third Country Directive Scheme. The entry of researchers from non-EU countries into Ireland had previously been administered through a work permit system. The new scheme established under the Directive provides for a more straightforward alternative mechanism for entry to the State for non-EU researchers and their families.

The Research Mobility Office also plays a crucial role in managing the hosting agreement scheme in Ireland. The Department of Justice, Equality and Law Reform and immigration authorities receive updates of hosting agreements through the Office for verification purposes.

The IUA is also responsible for the [researchcareersireland.com](http://researchcareersireland.com) online information portal which offers up-to-date information and assistance to researchers undertaking research positions either in Ireland or abroad. The primary objective of the [researchcareersireland.com](http://researchcareersireland.com) web site is to provide up-to-date information and assistance to researchers in all matters relating to their professional and daily lives and it is relevant to researchers wishing to move to Ireland as well as to Irish researchers who wish to work abroad. It does this by publicising practical information and advice on matters such as visa entry, residence and work permits, schooling, housing, social welfare, child care and language courses.

The [researchcareersireland.com](http://researchcareersireland.com) web site is the Irish element of the European pan-European Researcher's Mobility Portal. The Department of Enterprise, Trade and Employment, the IUA and the EU Commission provide funding for the [researchcareersireland.com](http://researchcareersireland.com) web site.

The social security rights of people from other EU Member States living and working in Ireland are governed by EU Regulations 1408/71 and 574/72. The regulations co-ordinate social security systems within the EU and are designed to remove obstacles to freedom of movement which would otherwise arise from loss or reduction of social security cover or entitlements when a person moves from one country to another. Ireland has supported the extension of Regulation (EEC) No 1408/71 to third country nationals on the basis that this extension was fully in line with national policy.

#### **4.1.2 Policies enhancing the attractiveness of research careers in Europe**

Irish policy-makers have recognised that the development of a structured researcher career path that is consistent across industry, academia and the public sector could help to strengthen Ireland's future as a knowledge economy. Such a development would help to encourage the transfer of knowledge, skills and technologies between the higher education and enterprise sectors. The Government's Strategy for Science

Technology and Innovation 2006-2013 highlights the need for the development of career paths that have the potential to give Ireland a competitive advantage in the international market for top researchers.

The [Advisory Council on Science, Technology and Innovation](#) which advises the Government on science and technology policy published a report in October 2008 which recommended a major restructuring of science careers in Ireland.

The report, *Towards a Framework for Researcher Careers*, recognises that an increasing number of researchers, both national and non-national, are being trained to a world-class standard in Ireland. However, the report points out that a more defined career structure is required to ensure industry and higher education colleges can take full advantage of this resource.

While acknowledging that the impact of the rapid rise in research funding in terms of the increased numbers of researchers employed in higher education institutions, the Council expressed a concern that these institutions would not be able to continue employing the same level of researchers in the future.

The Council also recognised that there was a danger that the increased funding being provided to the higher education sector might limit the mobility of Irish researchers going abroad to gain valuable experience and also their movement to the private sector.

The report contained a number of recommendations including the development of an appropriate career structure so as to enable the professionalisation of careers in research. It also advocated that all researchers in third-level institutions at similar levels should have comparable terms and conditions, including pension provision. Additionally, it specified that these levels should be comparable to those prevailing in enterprise and in the public sector.

The Advisory Science Council report also indicated that all seven Irish universities have signed the European Charter for Researchers.

Though Ireland has a relatively balanced researcher population in terms of gender (in 2006, 54 percent of PhD graduates in Ireland were males and 46 percent were female), there is concern at a policy level at the under-representation of women in science and engineering in Ireland.

Science Foundation Ireland has introduced three new funding initiatives the objective of which is to ensure that women have an equal opportunity to compete on the basis of their scientific expertise, knowledge and potential. The three programmes are the SFI Principal Investigator Career Advancement Award (PICA), the SFI Institute Planning Grant and Institute Development Awards and the SFI/Dell Computers Scholarship — Young Women in Engineering.

## **4.2 Governing research infrastructures**

The [Irish National Reform Programme 2008-2010](#) document states that Ireland broadly supports the overall approach of the Green Paper in relation to research infrastructures. It notes that there are strong arguments for taking action at a European level especially when it comes to large-scale specialised research infrastructures. Ireland both supports the work of the European Strategy Forum on Research Infrastructures (ESFRI) and endorses the ESFRI roadmap which covers all fields of science and includes both single-sited and distributed infrastructures.

As a small Member State, Ireland has an interest in ensuring that national infrastructures are connected within wider European networks and especially with the distributed and “virtual” infrastructures outlined in the ESFRI roadmap and ensuring that Irish researchers have access to specialist infrastructures elsewhere in Europe. While most of the ESFRI projects are still at an early stage in their development, Ireland is already an active participant in a number of preparatory actions (in areas such as clinical trials, ocean observation systems, infrastructures for the social sciences and humanities, etc.) and will continue to support the development of these infrastructures.

The ESFRI preparatory phase projects in which Irish research groups are participating include:

BBMRI	Network of existing and new biobanks;
ECRIN	Network of clinical research centres;
EMSO	Multidisciplinary seafloor observatory;
EURO ARGO	Ocean observing buoy system;
DARIAH	Digital infrastructure for cultural heritage institutions;
SHARE	Data infrastructure for research of population ageing;
KM3NET	Underwater Neutrino Observatory

Ireland has recently become a member of PRACE (Integrated European High Power Computing Service) and, therefore, is also likely to be associated with this pan-European endeavour.

There are many other areas where it is likely that Irish infrastructure will be integrated into European-wide infrastructures. Ireland will continue to invest actively in infrastructure around priority areas such as ICT, nanotechnology, biomedical and other life sciences, renewable energy, food and agriculture and also the social sciences and humanities. For the most part, it is likely that Ireland’s involvement in the ESFRI process will continue to be based largely on the integration of national facilities into wider distributed networks across Europe.

National planning for the provision of research infrastructures is undertaken with direct reference to the ESFRI roadmap and Ireland will make decisions regarding its formal membership status of the different pan-European infrastructure projects (including but not limited to the list above) as and when they move towards the actual construction/implementation phase.

The building block for Irish research infrastructures investment policies was a review undertaken jointly by the Higher Education Authority (HEA) and Forfás in 2006, which internationally benchmarked the research infrastructure in the higher education sector in particular. In undertaking the review, a deliberate decision was taken to involve partners from the ESFRI network in order to maximise the alignment between the national strategy and the ESFRI Roadmap. The review sought to identify gaps in the national platform of research infrastructure, which could be addressed in the short to medium term. The review was conducted having regard for the goals, objectives and enhanced investment proposed in the Strategy for Science, Technology and Innovation 2006–2013 and of the [National Development Plan 2007–2013](#).

The report, *Research Infrastructure in Ireland — Building for Tomorrow*, noted that notwithstanding the significant investment of funds in research infrastructure since 1998, and the remarkable transformation of the Irish research landscape since that time, weaknesses existed and gaps remain in the higher education and national

research infrastructure. This finding, in the context of the lack of investment prior to 1998, means in effect that Ireland was still in 'catch up' mode whilst at the same time trying to compete on an international level.

The report highlighted that building on the progress to date would require the Irish Government to balance several competing and critical demands on new investment funds such as:

- Consolidation of the investments recently made so as to ensure their full and effective exploitation;
- Broadening the base of research in the Irish higher-education sector;
- Investing for rapid development in specific, high-priority areas.

The report made a number of recommendations, one of which was a restructured PRTLTI that would accommodate support for new proposals and for existing investments, as well as for pre-determined infrastructures, disciplines or areas, on an open competitive basis.

The HEA/Forfás report was a key guiding document for the formulation of cycles 4 and 5 of the PRTLTI and related investments under the SSTI. The Government in January 2009 announced that funding under the fifth cycle of the PRTLTI would be targeted at the development of national shared facilities. Higher education institutions would be encouraged to submit proposals for the development of national shared facilities in areas of strategic national importance such as biomedical and health research; chemistry and pharmaceutical research; marine environmental research; environmental (waste management) research; and cultural heritage.

### **4.3 Research organisations**

The vision and agenda for Europe's public research institutions that is set out in the Green Paper, and the type of changes that are required, are broadly reflective of the type of change that are already well underway within Ireland. As such, the Irish Government endorses the view expressed in the Green Paper that "reforms underway in many countries need to be completed and extended to the whole of Europe." Aspects of this change programme in Ireland include:

- Improving links with business and society;
- Addressing rigidities in the functioning of institutions;
- Encouraging competition for funding and talent internationally;
- Adopting more professional approaches to the management of research;
- Adherence to more transparent standards of accountability.

A key element of Irish policy is to encourage higher education institutions and public research organisations to collaborate, where appropriate, in order to nurture a shift away from project-based funding to longer-term, strategic research programmes where a critical mass of activity can be generated and sustained. This is part of a combined approach which involves supporting the development of research infrastructure on a co-ordinated basis across the public research sector based on the strategic priorities of institutions, while at the same time funding individual researchers and research teams based on scientific excellence.

The two main supports which seek to foster inter-institutional collaboration are the Programme for Research in Third Level Institutions and the Strategic Innovation Fund. Both supports are funded by the Department of Education and Science and are administered by the Higher Education Authority.

Launched in 1998, the PRTLTI is anticipated over the period 1998-2013 to invest €1.2b (including exchequer and private matching funds) into strengthening national research capabilities via investment in human and physical infrastructure. The HEA has outlined one of the objectives of the PRTLTI as driving effective collaboration between higher education institutions in the national interest. It points out that the PRTLTI has been unique in the emphasis that it has placed on collaboration and the encouragement of institutions to focus on particular areas of research and to collaborate to strengthen national performance. This focus on institutional collaboration is key to achieving systemic synergies. Furthermore, the HEA believes that the programme will facilitate greater collaboration between research efforts in higher education institutions on the island of Ireland which is a key SSTI outcome. The Government announced in January 2009 that funding of €300m would be allocated under PRTLTI Cycle 5 covering the period 2009-2013 and indicated that one of the four priority areas would be to support higher education institutional collaboration.

The Strategic Innovation Fund (SIF) is a multi-annual fund, amounting to €510m over the period 2006–2013, which is directed towards support for innovation in higher education institutions. It supports new approaches to enhancing quality and effectiveness within higher education and research, incorporating the use of existing resources (including capital resources) more effectively, as well as new funding. Projects approved under SIF are aimed at enhancing collaboration between higher education institutions, improving teaching and learning, supporting institutional reform, promoting access and lifelong learning and supporting the development of fourth level education i.e. the development of structured post-graduate education programmes.

Of the total of 31 projects that were approved for funding under Cycle II of SIF announced in February 2008, 30 were collaborative. The collaborative nature of the projects means that each of the 7 universities, the 13 Institutes of Technology and the Dublin Institute of Technology will be involved in a number of projects under Cycle II. Additionally, 13 projects involve alliances between universities and institutes of technology. A total of €21m (out of the overall total of €97m) was allocated for proposals seeking to extend the research capacity of sector, in line with the Strategy for Science, Technology and Innovation 2006-2013.

The Government anticipates that the development of new strategic alliances funded under SIF will result in new synergies and potential for the higher education system. Additionally, the Government foresees that SIF will provide a new impetus to the development of system-wide quality. The SIF is also expected to drive reform of structures and systems within and across institutions to cater for growing student numbers at all levels, improved teaching and learning quality, ensuring graduates are equipped for a lifetime of innovation and change in the workplace and enhance Ireland's research and innovation capacity.

#### **4.4 Opening up national research programmes**

The Strategy for Science, Technology and Innovation 2006-2013 confirms the Government's ambition to develop Ireland as a leading knowledge-based economy. Underpinning this is a recognition that to facilitate the development of a sustainable system of world class research teams across all disciplines requires the attraction of leading researchers to Ireland.

Ireland, therefore, actively encourages the participation of non-nationals in research programmes; the majority of funding initiatives developed by Science Foundation Ireland are open to researchers from other countries. Some SFI initiatives such as the [ETS Walton Visitor Award](#) programme are directly targeted at non-nationals. SFI spent €2.2m on the ETS Walton Visitor Award programme in 2007.

There are no known funding programmes in Ireland, however, that allow a researcher to transfer a research grant if they move to another country. For example, in the majority of cases, all research projects funded by SFI must be carried out in Ireland. However, a review of Ireland's international STI linkages by the Advisory Science Council recommended that all STI funding agencies should review their policies around the opening of national programmes and schemes to participants based overseas and the flexibility of participants in Ireland to use national funding outside Ireland. In general terms, reciprocity should be required in any international partnerships but there may be cases where it makes sense for national funding to be used outside Ireland without this requirement (e.g. need to access specialist skills, capacity building in a particular field, preparing the ground for future STI partnerships and collaborations, etc.).

In relation to measures to foster joint approaches to research programmes, Ireland continues to engage in initiatives co-ordinated and facilitated by the European Commission to encourage greater co-ordination of national research programmes and to encourage joint approaches to the implementation of research programmes targeting specific technological and/or societal objectives.

In addition to participation in the long-standing Article 169 initiative for clinical trials relating to diseases in developing countries (EDCTP), Ireland has recently become associated with the Article 169 initiatives on Ambient Assisted Living (AAL) and the EUROSTARS initiative for research within SMEs.

Ireland has also become a founding member of the Joint Technology Initiatives on Nanoelectronics (ENIAC) and Embedded Systems (ARTEMIS). Irish researchers and enterprises are also becoming involved in the other Joint Technology Initiatives (that do not involve formal member state participation) such as the Innovative Medicines Initiative and Aeronautics & Air Transport (Clean Sky).

Outside of the formal Joint Technology Initiatives (JTIs) and Article 169 initiatives, Irish research funding organisations and other actors continue to participate actively in ERA-NETs and Technology Platforms. In total, twelve Government departments (ministries) and agencies are involved in 24 ERA-NETs and many of these are involved in joint calls. For example, in the social sciences and humanities area, Ireland is participating actively in HERA (Humanities in the European Research Area) and NORFACE (New Opportunities for Research Funding Agency Co-operation in Europe) through the Irish Research Council for the Humanities and Social Sciences (IRCHSS). Both HERA and NORFACE are operating joint calls for proposals in which IRCHSS is participating.

Irish policy-makers broadly agree with the analysis put forward in the original ERA communication (2000) and re-echoed in the Green Paper regarding the fragmentation of Europe's research effort. They take the view that the European research system is relatively complex and, in certain areas, this may result in sub-optimal performance and act as a barrier for researchers and enterprises, particularly those who are coming from countries outside Europe with more straightforward systems of research funding.

Irish policy-makers also support the view that optimisation in relation to enhanced levels of co-operation and co-ordination of research activities does not relate solely to the pooling of resources into common pots or "virtual common pots." They note that the Green Paper recognises the value of other forms of coordination and integration (e.g. joint foresight exercises, shared principles for the management of research programmes, etc.). For many areas, they believe it is probably more important that there is a sharing of ideas and optimisation of approaches regarding research priorities and other aspects of programme evaluation and monitoring as opposed to the administration of research funds.

#### ***4.5 National ERA-related policies — a summary***

There is a high degree of complementarity between Ireland's STI policies and the wider European Research Area agenda. Activities at a European level, including trans-national collaborative research, funding of frontier research and support for researcher mobility, are seen by Irish policy-makers as contributing directly to the achievement of national targets as set out in the main Irish strategy documents, the Strategy for Science, Technology and Innovation 2006-2013 (published in 2006) and the Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal (published in December 2008). Similarly, the activity stimulated in Ireland through its investment in science, technology and innovation and the initiatives being implemented to develop Ireland as a leading knowledge economy can play a part in the collective effort to strengthen the European research system.

This perspective is echoed in the recent Irish National Reform Programme 2008-2010 document which states that policies and programmes at national level are contributing directly and indirectly to the development of the European Research Area. The document notes that all of the actions taken to position Ireland as a country renowned for its research excellence, including the attraction of researchers to Ireland and the strengthening of research capacity within the Irish enterprise base, are framed within the context of a broader ERA agenda.

The National Reform Programme document details specific measures that Ireland is undertaking with reference to the European Research Area such as:

- Ireland has fully implemented the directive for the admission of "third country" researchers to Ireland and announced arrangements in October 2007 to give effect to this directive;
- Ireland continues to actively engage in the initiatives coordinated and facilitated by the European Commission to encourage greater coordination of national research programmes and to encourage joint approaches to the implementation of research programmes targeting specific technological and/or societal objectives;
- Ireland is also participating in a number of projects linked to the ESFRI roadmap for European research infrastructures.

These initiatives reflect the increasing focus by Irish policy-makers on ERA-related objectives and activities. There is a recognition that at an official level of the extent of Ireland's international research connections with Europe: 80% of Irish external research linkages are within the European Research Area.

Policy-makers see clear advantages for Ireland in terms of access to specialised skills and resources and also the opportunity to avoid duplication of expensive large-scale research facilities.

**Table 10: Importance of the ERA pillars in the ERA policy mix and key characteristics**

	Short assessment of its importance in the ERA policy mix	Key characteristics of policies
Labour market for researchers	<ul style="list-style-type: none"> <li>• Ireland attaches great importance to the issue of researcher mobility within the ERA. The issue of researcher careers – producing, retaining and attracting the appropriate quantity and quality of researchers to meet the needs of a knowledge-intensive economy – is a top priority for Ireland</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of the European Charter for Researchers and Code of Practice for their Recruitment</li> <li>• Implementation of the Third Country Directive for Admission of Researchers</li> <li>• Development of career framework for researchers</li> </ul>
Governance of research infrastructures	<ul style="list-style-type: none"> <li>• Support for the Green Paper's emphasis on the ESFRI road-map</li> <li>• Development of outline public sector research infrastructure policy</li> </ul>	<ul style="list-style-type: none"> <li>• Participation in ESFRI activities</li> </ul>
Autonomy of research institutions	<ul style="list-style-type: none"> <li>• Government policy is to encourage higher education institutions and public research organisations to collaborate, where appropriate, in order to nurture a shift away from project-based funding to longer-term, strategic research programmes where a critical mass of activity can be generated and sustained</li> </ul>	<ul style="list-style-type: none"> <li>• Cycle 5 of the Programme for Research in Third Level Institutions continues to promote higher education institutional collaboration</li> </ul>
Opening up of national research programmes	<ul style="list-style-type: none"> <li>• Ireland is supportive of the main thrust of the Green Paper in terms of having a strong international dimension to science and technology</li> </ul>	<ul style="list-style-type: none"> <li>• Ireland is an active participant in ERA-NET and JTI projects and in pilot initiatives associated with Joint Programming of Research</li> </ul>

## 5 Conclusions and open questions

### 5.1 Policy mix towards national R&D investment goals

The first report on the Strategy for Science, Technology and Innovation 2006-2013 (SSTI) reveals that expenditure on research and development within the higher education sector has almost quadrupled in current terms over ten years and has now reached the OECD and EU-25 average HERD intensity rates. The report stated that between 2004 and 2006, the HERD spending intensity ratio for Ireland stood at 0.40% of GNP and had matched the overall EU-25 average HERD intensity ratio.

The latest preliminary BERD figures for 2007/2008 indicate continued growth in expenditure by enterprises on R&D. The National Competitiveness Council in its Annual Competitiveness Report 2008 states that despite strong growth rates in expenditure, business R&D as a percentage of economic activity has remained

relatively static over the past decade. This raises concerns whether Irish business expenditure on research and development will achieve its target of 1.7% of GNP by 2013 as outlined in the SSTI.

Several structural factors form barriers to investment in R&D by the private sector in Ireland. Multinational companies based in Ireland account for approximately 70% of BERD and a significant proportion of this expenditure is accounted for by a small number of companies. Expenditure on research and development among the indigenous enterprise sector, which mainly comprises SMEs, is largely concentrated in a small number of business sectors such as software/computer-related and among a small number of companies.

Other structural barriers include the lack of specialised or industry-specific research organisations in Ireland to assist in the transfer of technology to the enterprise sector.

Recent policy documents such as the Irish National Reform Programme 2008-2010 and Building Ireland's Smart Economy put considerable policy emphasis on the establishment of new R&D performing enterprises (policy mix route 1) and encouraging existing R&D performers to invest more in research (policy mix route 2).

The Government in its policy mix formulation is also putting considerable emphasis on attracting a greater share of mobile FDI R&D projects. The Government announced in the 2009 Budget that it was enhancing the R&D tax credit so as to maximise Ireland's attractiveness as a location for multinational companies to undertake research and development. It remains to be seen whether in the current difficult international economic environment the improved tax credit will be successful.

The development of linkages between the enterprise and higher education sectors in an important policy objective. New and existing support measures seek to strengthen the transfer of skills and knowledge from the higher education institutions to the enterprise sector. A key Government objective is to commercialisation of research outcomes from the substantial investment in research and development Ireland has made in the higher education sector.

The lack of specialised or sector-specific research institutions means that the higher education institutions will be required, in addition to their existing teaching and research roles, to initiate and support innovation in the enterprise sector.

## **5.2 ERA-related policies**

ERA and ERA-related policies are regarded as having important influences on Irish science, technology and innovation policies. This can be observed in relation to researcher mobility which is an issue of key importance to Ireland given its ambition to be a leading knowledge economy. Irish policy-makers consider that national and EU policies on researcher mobility show a clear overlap as both aim to improve the mobility of researchers generally and young researchers and women in science in particular. Important Irish initiatives in this area with a strong ERA connection are the transposition of the Third Country Directive and the development of the [researchcareersireland.com](http://researchcareersireland.com) web site.

ERA policies, in particular the ESFRI initiative, have also influenced Irish thinking in relation to research infrastructures. A deliberate decision was taken by the Irish authorities in reviewing Irish higher education research infrastructures to involve

partners from the ESFRI network in order to maximise the alignment between national strategies and the ESFRI Roadmap.

ERA's vision and agenda for Europe's public research institutions are broadly reflective of the type of change that is already well underway within Ireland where higher education institutions and public research institutions are encouraged to collaborate in order to facilitate a shift from project-based funding to longer-term, strategic research programmes where a critical mass of activity can be generated and sustained.

The Irish National Reform Programme 2008-2010 document is unequivocal in specifying that national policies and programmes contribute directly and indirectly to the development of the European Research Area. The document states that all of the Government's STI policies and support measures, such as the attraction of researchers to Ireland and the strengthening of research capacity within the Irish enterprise base, are framed within the context of a broader ERA agenda.

## References

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- Advisory Council for Science, Technology and Innovation (2008): Ireland's International Engagement in Science, Technology and Innovation.
- Advisory Council for Science, Technology and Innovation (2008): Towards a Framework for Researcher Careers.
- Department of Enterprise, Trade and Employment (1996): White Paper on Science, Technology and Innovation.
- Department of Enterprise, Trade and Employment (2006): [Strategy for Science, Technology and Innovation 2006–2013](#).
- Department of Enterprise, Trade and Employment (2008): First Report on the Strategy for Science, Technology and Innovation 2006–2013.
- Department of Enterprise, Trade and Employment (2008): Innovation in Ireland - Innovation Policy Statement.
- Department of Finance (2007): [National Development Plan 2007–2013](#).
- Department of the Taoiseach [Prime Minister] (2005): [Lisbon Agenda — Integrated Guidelines for Growth and Jobs: National Reform Programme Ireland](#).
- Department of the Taoiseach (2008): Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal.
- Department of the Taoiseach (2008): [Lisbon Agenda — Integrated Guidelines for Growth and Jobs: National Reform Programme Ireland 2008-2010](#)
- Department of the Taoiseach (2006): Towards 2016: Ten-Year Framework Social Partnership Agreement 2006-2015.
- Enterprise Ireland (2007): Transforming Irish Industry — Enterprise Ireland Strategy 2008–2010.
- ERAWATCH Network (2006): [ERAWATCH Country Specialisation Report. Country: Ireland](#).
- ERAWATCH Research Inventory (2008): [Country profile for Ireland](#) (ERAWATCH Network Country correspondent: Tom Martin).
- European Commission (2008): INNO-Policy TrendChart — Policy Trends and Appraisal Report, Ireland, 2008. [http://www.proinno-europe.eu/extranet/upload/countryreports/Country\\_Report\\_Ireland\\_2008.pdf](http://www.proinno-europe.eu/extranet/upload/countryreports/Country_Report_Ireland_2008.pdf)
- European Communities (2007): Green Paper — The European Research Area: New Perspective.
- EUROSTAT (2008): Europe in Figures — Eurostat yearbook 2008.
- EUROSTAT (2008): Science, Technology and Innovation in Europe (2008 edition).
- Expert Group on Future Skills Needs (2007): Tomorrow's Skills — Towards a National Skills Strategy.
- Forfás (2004): Building Ireland's Knowledge Economy — The Irish Action Plan for Promoting Investment in R&D to 2010 (Report to the Inter Departmental Committee on Science, Technology and Innovation).
- Forfás (2005): Making Technological Knowledge Work — A Study of the Absorptive Capacity of Irish SMEs.
- Forfás (2007): Research and Development Performance in the Business Sector Ireland 2005/6.
- Forfás (2007): Research and Development Statistics in Ireland, 2006 — At a glance.
- Forfás (2007): The Science Budget 2006/2007.

- Forfás (2008): Catching the Wave: A Services Strategy for Ireland.
- Forfás (2008): The Higher Education R&D Survey 2006 (HERD).
- Forfás/Central Statistics Office (2009): Statistical Release: Business Expenditure on Research and Development 2007/2008 — Preliminary Findings.
- Forfás/Higher Education Authority (2007): Research Infrastructures in Ireland — Building for Tomorrow.
- Government of Ireland (2007): National Reform Programme — Ireland (2<sup>nd</sup> Annual Progress Report).
- National Competitiveness Council (2008): Annual Competitiveness Report 2008 (Volumes 1 and 2).
- Science Foundation Ireland (2004): Vision 2004–2008 — People, Ideas and Partnerships for a Globally Competitive Irish Research System.

## List of Abbreviations

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ASC	Advisory Science Council
BERD	Business Expenditure on Research and Development
BMW	Border, Midland and Western Region
CSF	Community Support Framework
CSO	Central Statistics Office
DES	Department of Education and Science
DETE	Department of Enterprise, Trade and Employment
EFG	Enterprise Feedback Group
EI	Enterprise Ireland
ERA	European Research Area
ERDF	European Regional Development Fund
ESF	European Social Fund
FDI	Foreign Direct Investment
FP	European Framework Programme for Research and Technology Development
GBAORD	Government Budget Outlays or Appropriations of R&D
GERD	Gross Expenditure on Research and Development
GOVERD	Government sector performed R&D
HEA	Higher Education Authority
HEI	Higher education institutions
HERD	Higher Education Expenditure on Research and Development
HERG	Higher Education Research Group
HES	Higher education sector
HRB	Health Research Board
HRG	Health Research Group
ICT	Information and Communications Technology
IDA	Industrial Development Authority
NDP	National Development Plan

NESDO	National Economic and Social Development Office
NRP	National Reform Programme
OP	Operational Programme
OSTI	Office of Science, Technology and Innovation
PRO	Public Research Organisations
R&D	Research and Development
RDI	Research, Development and Innovation
RTDI	Research, Technological Development and Innovation
S&E	Southern and Eastern Region
S&T	Science and technology
SF	Structural Funds
SFI	Science Foundation Ireland

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### **Abstract**

The main objective of the ERAWATCH Policy Mix Country reports 2009 is to characterise and assess in a structured manner the evolution of the national policy mixes in the perspective of the Lisbon goals, with a particular focus on the national R&D investments targets and on the realisation and better governance of the European Research Area. The reports were produced for all EU Member State and six Associated States to support the mutual learning process and the monitoring of Member and Associated States' efforts by DG-RTD in the context of the Lisbon Strategy and the European Research Area. The country reports 2009 build and extend on the analysis provided by analytical country reports 2008 and on a synthesis of information from the ERAWATCH Research Inventory and other important available information sources.

This report encompasses an analysis of the research system and policies in Ireland.

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