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# The Science Budget 2014-2015



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

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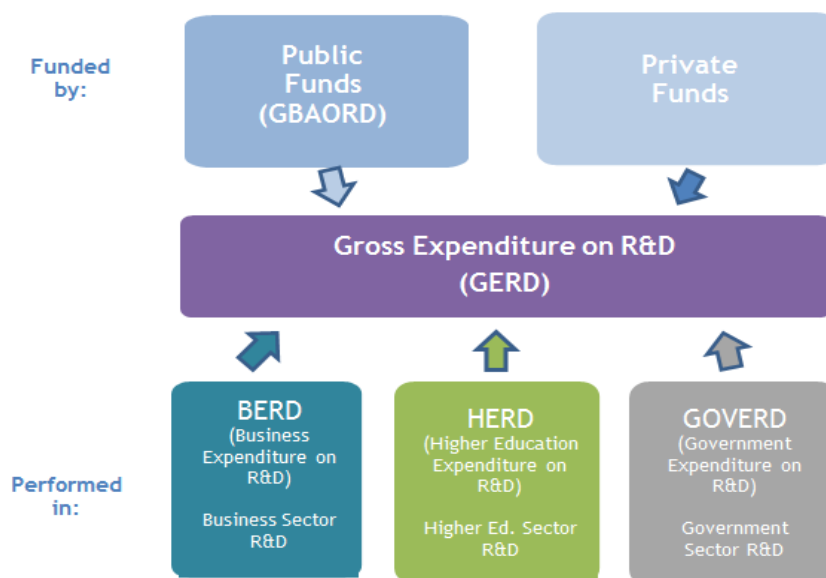
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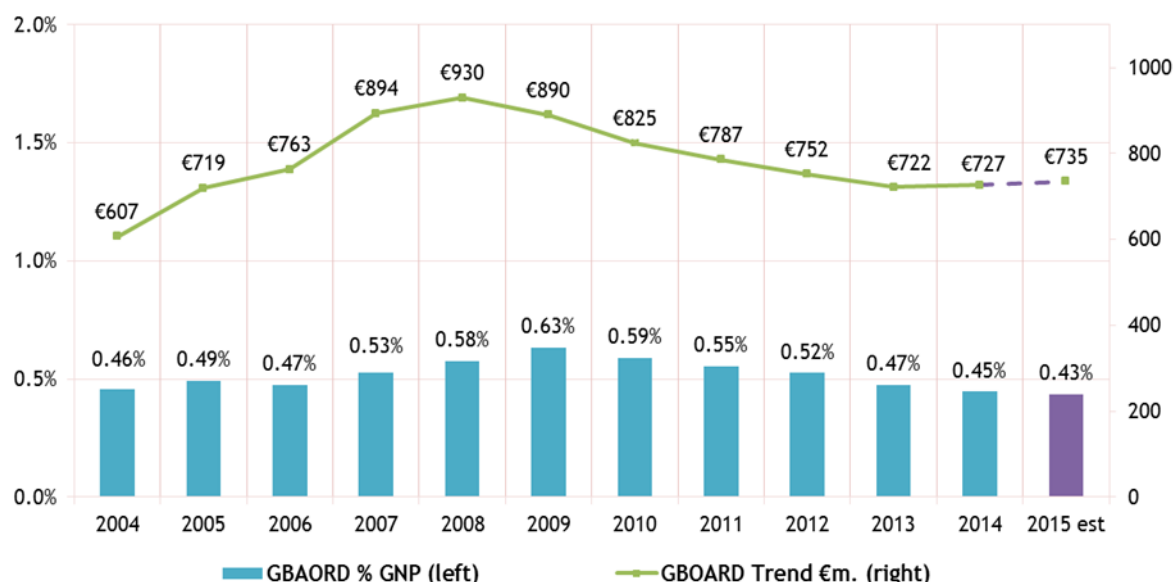
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## Executive Summary

This report presents the latest available data on Ireland's R&D expenditure across the various sectors. A schematic of the constituent elements of Ireland's R&D infrastructure is illustrated below.



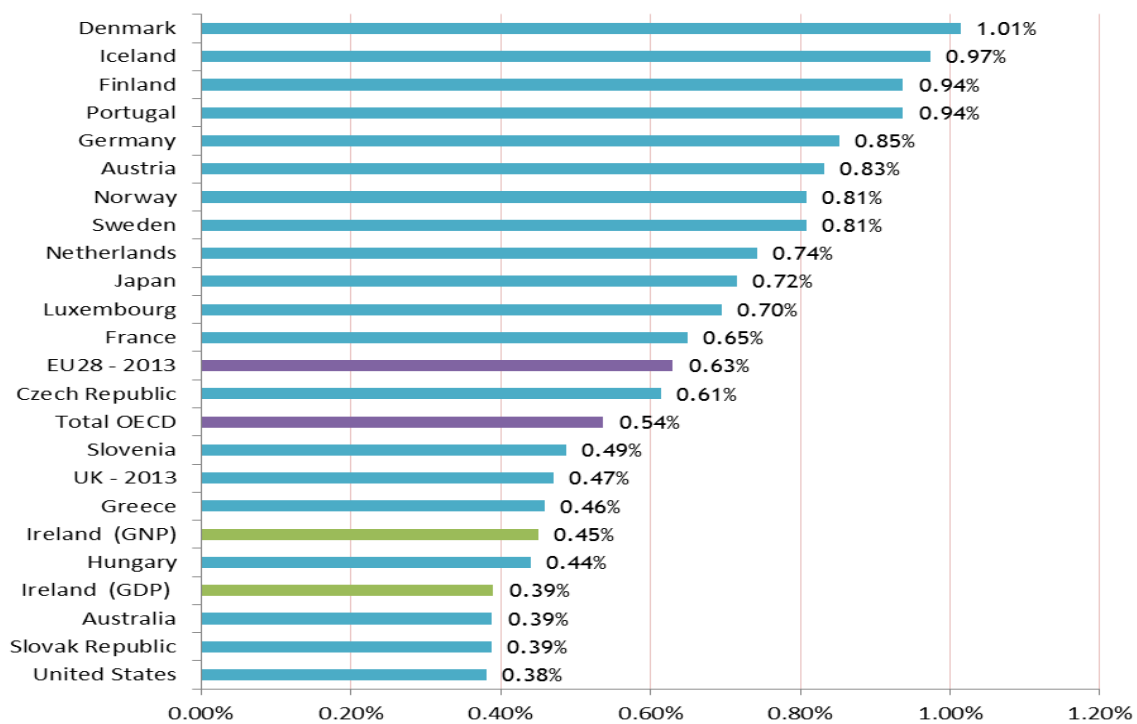
**Figure A: GBAORD - Government R&D Budget (€m.) (current prices) and as a % of GNP, 2004-2015**



The Government's budget for research and development increased slightly in 2014 to €727m and is estimated to increase again in 2015 with allocated funding of €735m.

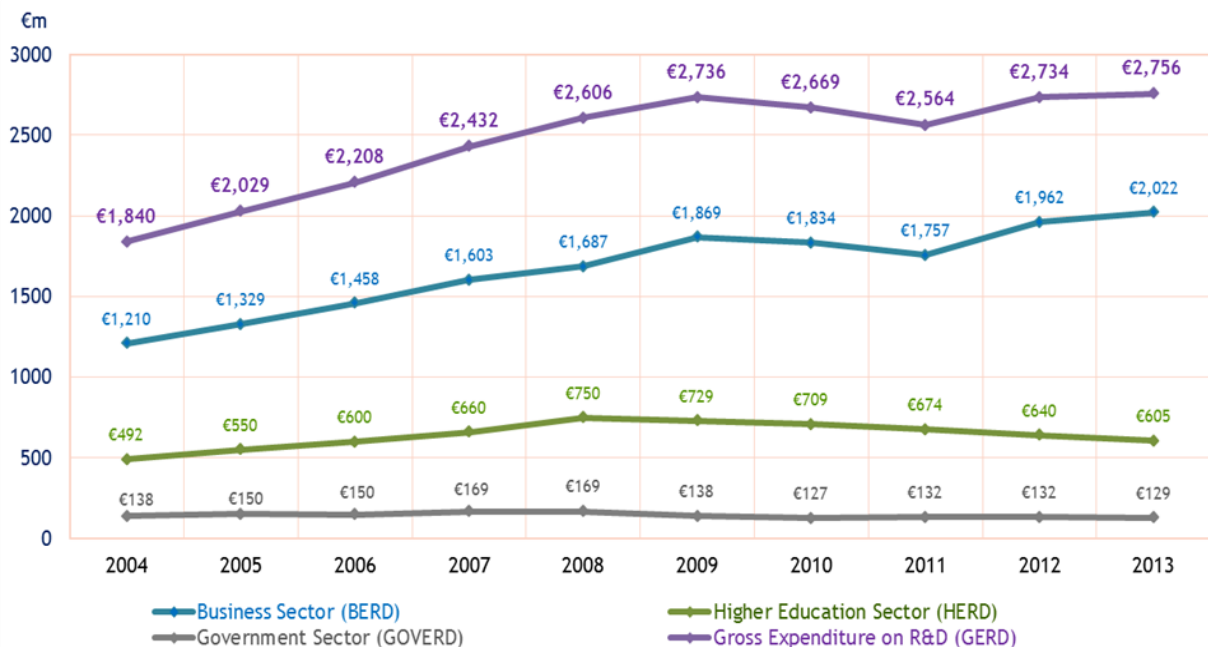
The R&D budget as a percentage of GNP (R&D intensity) fell to 0.45% in 2014 and is expected to reduce in 2015 to 0.43%.

**Figure B: International comparison of GBAORD as a percentage of GDP, 2014**



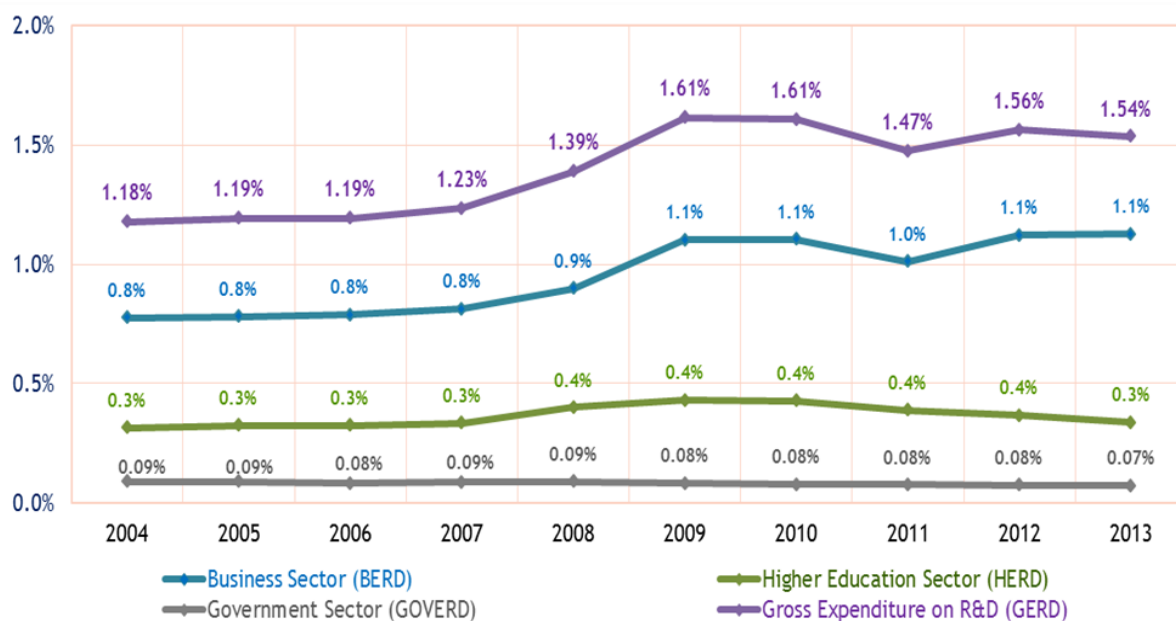
The Irish Government's R&D budget intensity rate in 2014 was 0.45% of GNP and 0.39% of GDP. This graph shows the results for all countries where figures are available for 2014 and Ireland is below the OECD average of 0.54%. Latest data for EU28 member states is for 2013 and shows an average of 0.63% of GDP.

**Figure C: GERD - Gross Expenditure on Research and Development, 2004-2013**



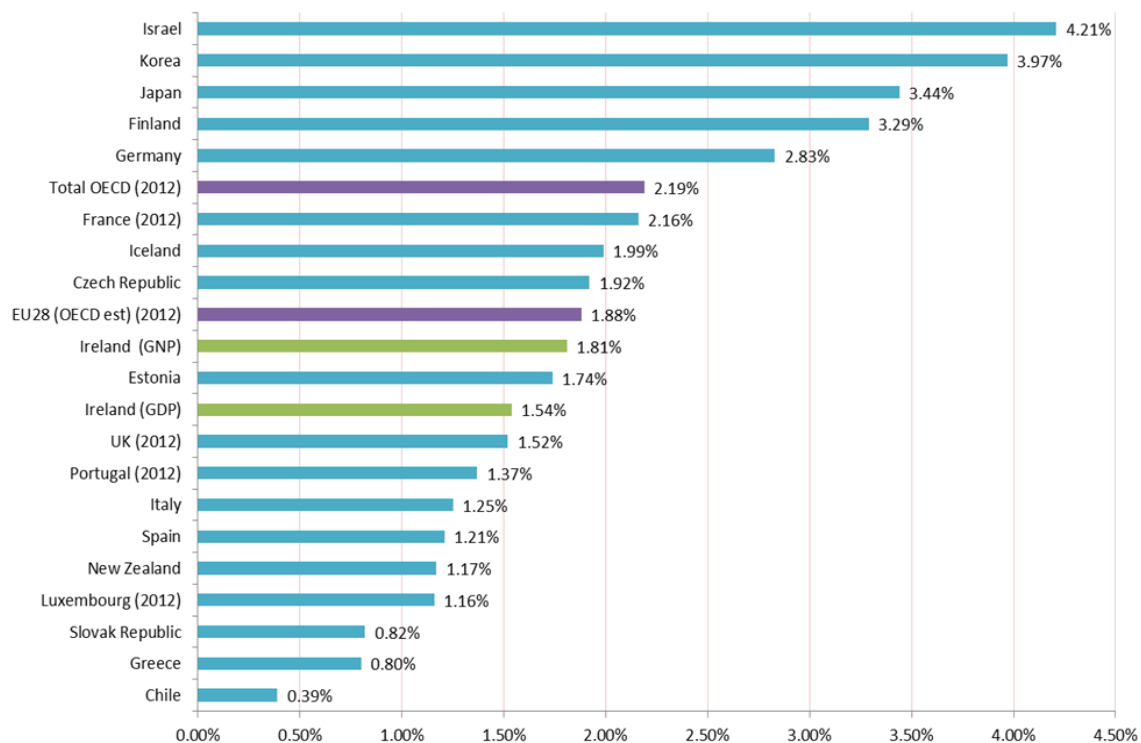
The Gross Expenditure on R&D (GERD) by all sectors in the Irish economy in 2013 was €2,756m an increase of 0.8% on the 2012 outturn figures. The Business Sector spent the largest portion of this with an expenditure of €2,022m.

Figure D: Gross Expenditure on R&D (GERD) as a percentage of GDP, 2004-2013



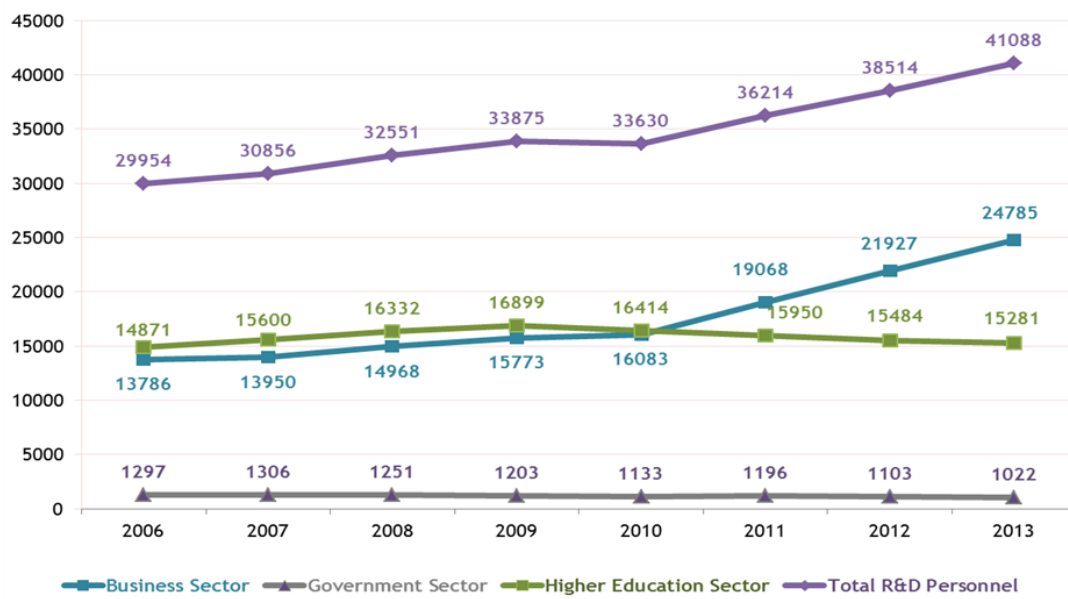
Ireland’s Gross expenditure on R&D (GERD) was 1.54% in 2013 when expressed as a percentage of GDP and it shows a slight decline in R&D intensity over the previous year. The R&D intensity level of business sector expenditure has remained at approximately 1.1% since 2009.

Figure E: GERD as a percentage of GDP - International comparison, 2013



When GERD in 2013 is expressed as a percentage of GNP and GDP it amounts to 1.81% and 1.54% respectively. The estimated EU28 country average of R&D expenditure as a percentage of GDP for 2012 was 1.88%

**Figure F: R&D Personnel in Ireland by Sector 2006-2013**



The total number of R&D Personnel in Ireland in 2013 stood at 41,088. The numbers engaged in R&D has risen steadily since 2010 due to the rise in R&D staff employed in the Business Sector.



## Introduction

### Definition of Research and Development

*R&D “comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”<sup>1</sup>.*

Frascati Manual, OECD - 2002

This report tracks Government budget allocations for Research & Development (R&D) over the period 2004 to 2015.

The most recent data for this time-series was collected through the ‘Research & Development Funding and Performance in the State Sector 2014-2015’ survey undertaken by the Department of Jobs, Enterprise and Innovation (DJEI)<sup>2</sup> earlier this year. (See Appendix 1 for Methodology and Appendix 6 for a copy of the questionnaire.)

The survey was sent to a total of 35 Government departments and agencies who are engaged in some form of R&D activity in 2014 and for 2015. (See Appendix 3 for the list of Government Departments and their Agencies who provided data for this report.)

In addition, the report brings together the expenditure and personnel figures for the R&D performers in the economy. Data on R&D performers is collected through three surveys and the latest data is available from 2004-2013. The most recent surveys are:

- ‘Business Expenditure on Research and Development 2013-2014 (BERD)’ carried out by the Central Statistics Office (CSO)
- ‘Research & Development in the Higher Education Sector 2012-2013 (HERD)’ carried out by Department of Jobs, Enterprise and Innovation (DJEI).
- ‘Research & Development Funding and Performance in the State Sector 2014-2015’ survey undertaken by the Department of Jobs, Enterprise and Innovation (DJEI).

All surveys are carried out using the definitions, rules and guidelines set out in the OECD Frascati Manual. This allows for a common dataset to be collected across all OECD and EU countries and facilitates international comparisons and benchmarking. All international comparison figures relate to the most recent data available for each country.

Data from these three surveys has been required since 2014 under:

- Commission Regulation (EC) No 995/2012 implementing Decision No 1608/2003/EC<sup>3</sup>. This Regulation covers the production and development of Community statistics on science and technology. The surveys collect information about the research and development activities across all sectors of the economy.

<sup>1</sup> Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development, OECD, Paris, 2002 [www.oecd.org/sti/frascaticmanual](http://www.oecd.org/sti/frascaticmanual)

<sup>2</sup> This survey was previously conducted by Forfás which was dissolved in 2014. The policy advisory & survey analysis functions of Forfás are now integrated with the Department of Jobs, Enterprise and Innovation. [www.djei.ie](http://www.djei.ie)

<sup>3</sup> Commission Regulation (EU) No 995/2012  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:299:0018:0030:EN:PDF>

In addition, this survey data is required for, and/or included in, the following reports:

- OECD 'International data collection on resources devoted to research and development'.<sup>4</sup>
- Ireland's Strategy for Science, Technology & Innovation (SSTI): Indicators collected are included and used in the preparation of the SSTI to identify key challenges.

## Report indicators

### A. Government Budget for R&D (GBAORD) - Chapter 1

- GBAORD - Government Budget Appropriations or Outlays for R&D. This is all the funding allocated by Government to R&D to be performed in all sectors of the economy e.g. within the higher education sector, by businesses or by Government Agencies.

### B. Gross Expenditure on R&D (GERD) & Personnel in All sectors- Chapters 2+3

- Total expenditure and personnel engaged on R&D in the country by all sectors of the economy. Collectively, the expenditure in the government, business and the higher education sectors. This indicator includes all expenditure from all sources spent on R&D performed in these sectors.

### C. Government Sector R&D (GOVERD) - Chapter 4

- Government Sector (GOVERD - Government Expenditure on R&D). This Chapter takes a more detailed look at R&D performed in the Government Sector. Indicators include R&D expenditure and Personnel employed in the Government sector.

*The Department of Jobs, Enterprise and Innovation would like to thank and acknowledge the time and attention of the many respondents to our survey  
'Research & Development Funding and Performance in the State Sector 2014-2015'*

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<sup>4</sup> Main Science and Technology Indicators (MSTI), OECD  
[http://stats.oecd.org/viewhtml.aspx?datasetcode=MSTI\\_PUB&lang=en](http://stats.oecd.org/viewhtml.aspx?datasetcode=MSTI_PUB&lang=en)

## Chapter 1: Government R&D Budget - GBAORD

The internationally recognised indicator for benchmarking State-funded performance of R&D is the Government Budget Appropriations or Outlays for R&D metric (GBAORD). In this chapter, total Government expenditure on R&D is charted and benchmarked against international competitors.

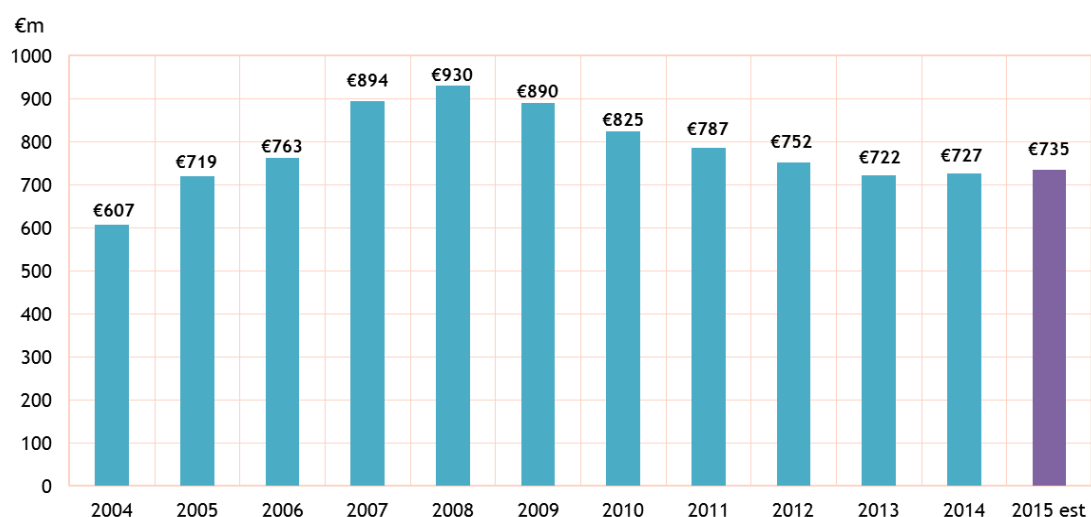
This data has been required since 2004 under Commission Regulation (EU) No 995/2012<sup>5</sup>

### 1.1 Government budget for research and development (GBAORD)

GBAORD includes:

- Government funding for R&D programmes in the higher education sector administered by the Department of Education and Skills, the Higher Education Authority (HEA), Science Foundation Ireland (SFI) and others;
- Government funding for business sector R&D, administered through State agencies including IDA Ireland, Enterprise Ireland and others; and
- Government funding for R&D performed in the public sector e.g. Teagasc, the Marine Institute and others.
- Also included in GBAORD are Government contributions to international R&D programmes or organisations solely or mainly concerned with R&D.

**Figure 1: GBAORD trend in current prices, €m. (2004-2015)**



Government funding of R&D in 2014 was €727m and represents a slight increase over the outturn figure for 2013 of 0.7% and represents the first increase since 2008.

It is estimated that expenditure will increase again in 2015 to €735m, a further increase of 1%.

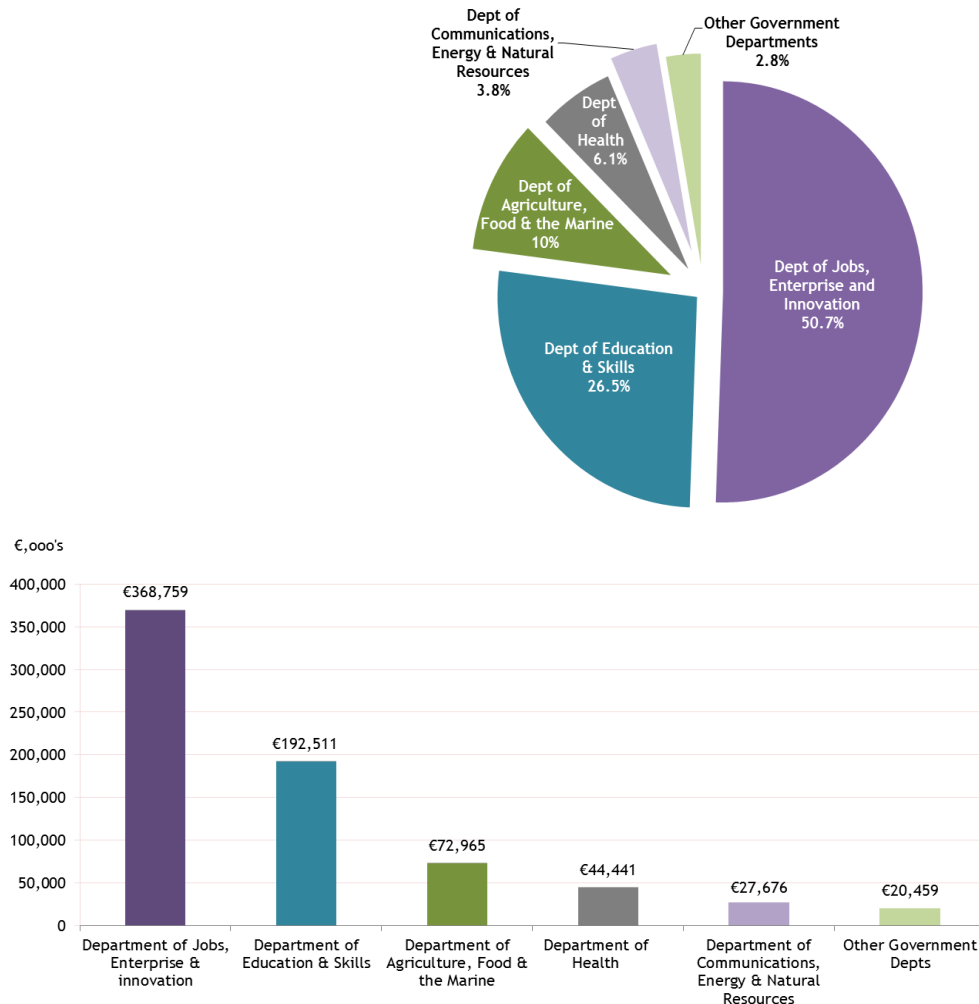
<sup>5</sup> Commission Regulation (EU) No 995/2012

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:299:0018:0030:EN:PDF>

## 1.2 GBAORD by Government Department, 2014

This chart shows the breakdown of GBAORD by Government Department. The three largest funding Departments account for 87.2% of all Government investment in research and development.

**Figure 2: Breakdown of GBAORD by Government Departments (2014)**



In 2014, the Department of Jobs, Enterprise and Innovation (DJEI) was responsible for the largest proportion of Government investment in R&D at €368.7m or 50.7% of total GBAORD<sup>6</sup>.

The Department of Education and Skills had an R&D allocation in 2014 of €192.5m or 26.5%.

The Department of Agriculture, Food and the Marine invested €72.9m or 10% of total GBAORD in 2014.

<sup>6</sup> Funding for the Programme of Research in Third Level Institutions (PRTL) is provided by the Department of Jobs, Enterprise and Innovation and is managed by the Higher Education Authority. For the purpose of the departmental breakdown in Figure 2, the funding is attributed to DJEI. The detail on the PRTL allocation is provided under the Higher Education Authority in Appendix 5.

**Table 1: Main Government Departments/Agencies with spending on R&D, 2014-2015**

Funding Agencies / Departments	2014 Outturn €m	% of Total	2015 Allocation €m	% of Total
Higher Education Authority (HEA)	204.8	28.1%	189.1	25.7%
Science Foundation Ireland (SFI)	153.5	21.1%	157.0	21.4%
Enterprise Ireland (EI)	100.9	13.9%	99.6	13.5%
Teagasc	60.2	8.3%	65.7	8.9%
IDA Ireland	45.3	6.2%	62.0	8.4%
Health Research Board (HRB)	41.6	5.7%	41.1	5.6%
Irish Research Council (IRC)	31.4	4.3%	31.4	4.3%
Dept. of Agriculture, Food and the Marine	23.0	3.2%	23.0	3.1%
Dept. of Jobs, Enterprise and Innovation	21.5	3.0%	21.5	2.9%
Marine Institute	8.9	1.2%	7.9	1.1%
Environmental Protection Agency (EPA)	8.2	1.1%	7.0	1.0%
Sustainable Energy Authority of Ireland (SEAI)	5.7	0.8%	6.5	0.9%
Economic and Social Research Institute (ESRI)	5.6	0.8%	5.9	0.8%
Others	16.2	2.2%	17.5	2.4%
Total	€726.8m		€735.2m	

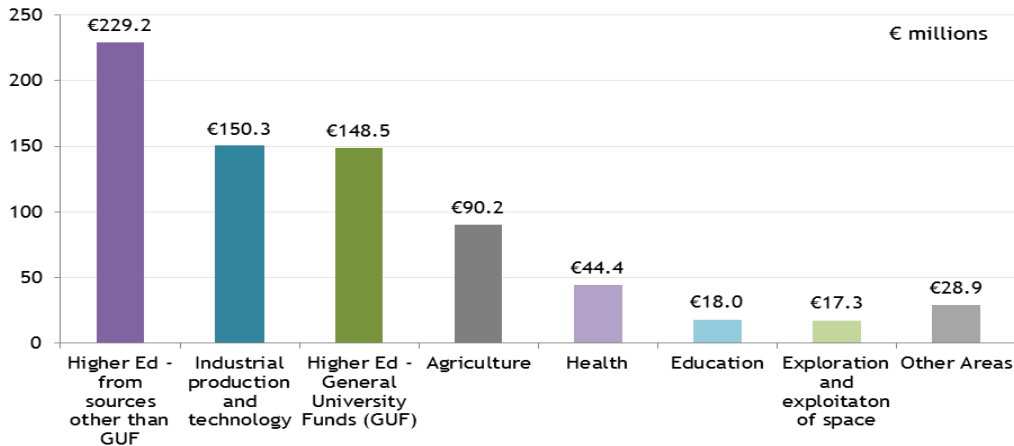
Table 1 provides a breakdown of estimated R&D spending by the main administering Government departments and agencies in 2015 alongside the outturn figures for 2014.

The largest public body funding R&D activities in 2014 was the Higher Education Authority (HEA), with expenditure of €204.8m representing 28.1% of total funding. In addition to General University Funds (GUF), overall spending by the HEA includes expenditure on R&D programmes such as DJEI's Programme for Research in Third Level Institutions (PRTLTI) that supports building institutional research capacity, enabling the establishment of research centres and facilitating joint research programmes and national initiatives.

The next largest funder of R&D activities was Science Foundation Ireland (SFI), allocating €153.5m or 21.1% of Government support to R&D in 2014 through research grants and other research supporting programmes. Enterprise Ireland provides support for enterprise related research and development activity through in-firm R&D supports as well as support for the commercialisation of research undertaken in the higher education sector. Enterprise Ireland invested funds of €101m in 2014 or 13.9% of total Government R&D investment. Together these three major funders accounted for 63% of total state investment in R&D in 2014. A detailed summary of the main research programmes are outlined in Appendix 5.

### 1.3 GBAORD classified by area of research, 2014-2015

Figure 3: GBAORD by Areas of Research, 2014



GBAORD is classified here under NABS<sup>7</sup> and shows that over half of total funding for 2014 was allocated for R&D performed in higher education.

Table 2: GBAORD classifications for Ireland 2014-15

	2014 €m	% of Total	2015 (est) €m	% of Total
R&D in Higher Education financed from sources other <sup>8</sup> than General University Funds (GUF)	229.2	31.5%	222.2	30.2%
Industrial production and technology	150.3	20.7%	164.8	22.4%
R&D financed from General University Funds (GUF)	148.5	20.4%	142.0	19.3%
Agriculture	90.2	12.4%	95.6	13.0%
Health	44.4	6.1%	43.8	6.0%
Education	18.0	2.5%	19.9	2.7%
Exploration and exploitation of space	17.3	2.4%	17.3	2.4%
Environment	8.3	1.1%	7.1	1.0%
Political, social systems, structures and processes	7.8	1.1%	8.0	1.1%
Energy	5.7	0.8%	8.0	1.1%
Transport, telecom. & other infrastructures	4.1	0.6%	3.6	0.5%
Exploration and exploitation of the earth	3.0	0.4%	2.9	0.4%
<b>Total</b>	<b>€726.8m</b>		<b>€735.2m</b>	

<sup>7</sup> NABS - Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets 2007, Eurostat, October 2008, <http://www.oecd.org/dataoecd/62/38/43299905.pdf>

<sup>8</sup> Examples of 'sources other than GUF' are: Science Foundation Ireland, Irish Research Council

#### 1.4 GBAORD as a percentage of GNP, 2004-2015

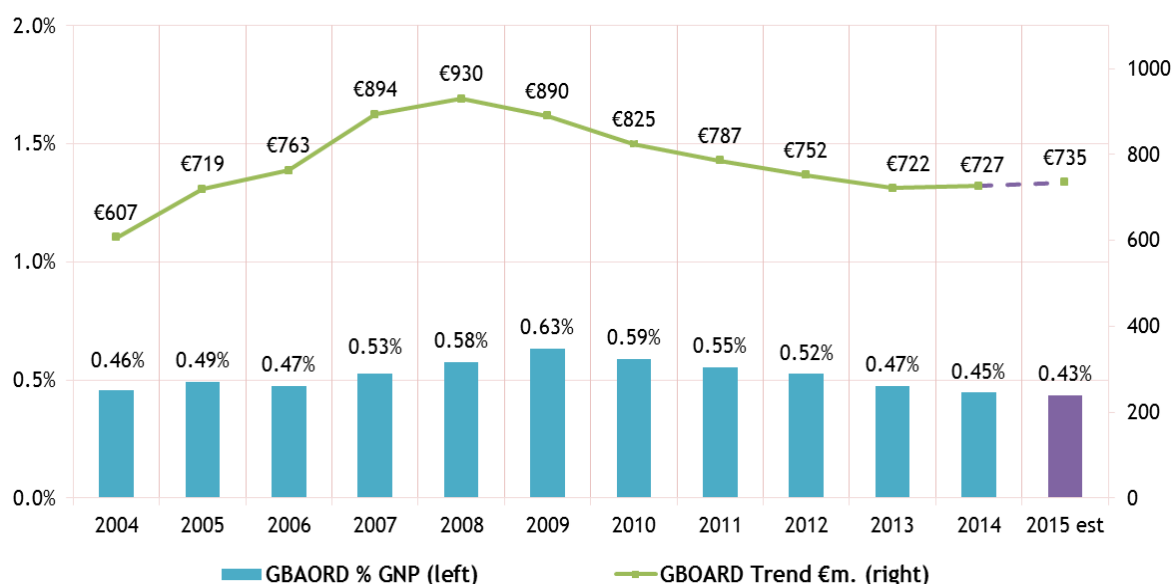
In order to compare state funding of R&D across countries, the OECD recommends using the GBAORD indicator with data derived using the guidelines set out in the Frascati Manual<sup>9</sup>.

GBAORD includes all funding for R&D from direct exchequer sources. It also includes funding for R&D in the humanities and social sciences.

In Figure 4, the GBAORD trend line shows that between 2004 and 2008 there was a considerable increase in state R&D spending from €607m to €930m in current prices. This was then followed by an annual downward trend for the next five years until 2013 to €722m.

The trend was reversed in 2014 and there was a small increase in GBAORD of 0.7% to €727m. The allocated GBAORD estimate for 2015 of €735m continues this trend showing a further increase of 1% over the 2014 figure.

**Figure 4: GBAORD trend (€m) and GBAORD as a percentage of GNP (2004-2015)**



The GBAORD intensity ratio (State R&D funding for R&D activities as a percentage of economic activity - Gross National Product (GNP)) was at 0.45% in 2014.

The period 2004 to 2008 saw the GBAORD intensity ratio hover around 0.5% - this was during a period of strong funding arising out of strong economic growth.

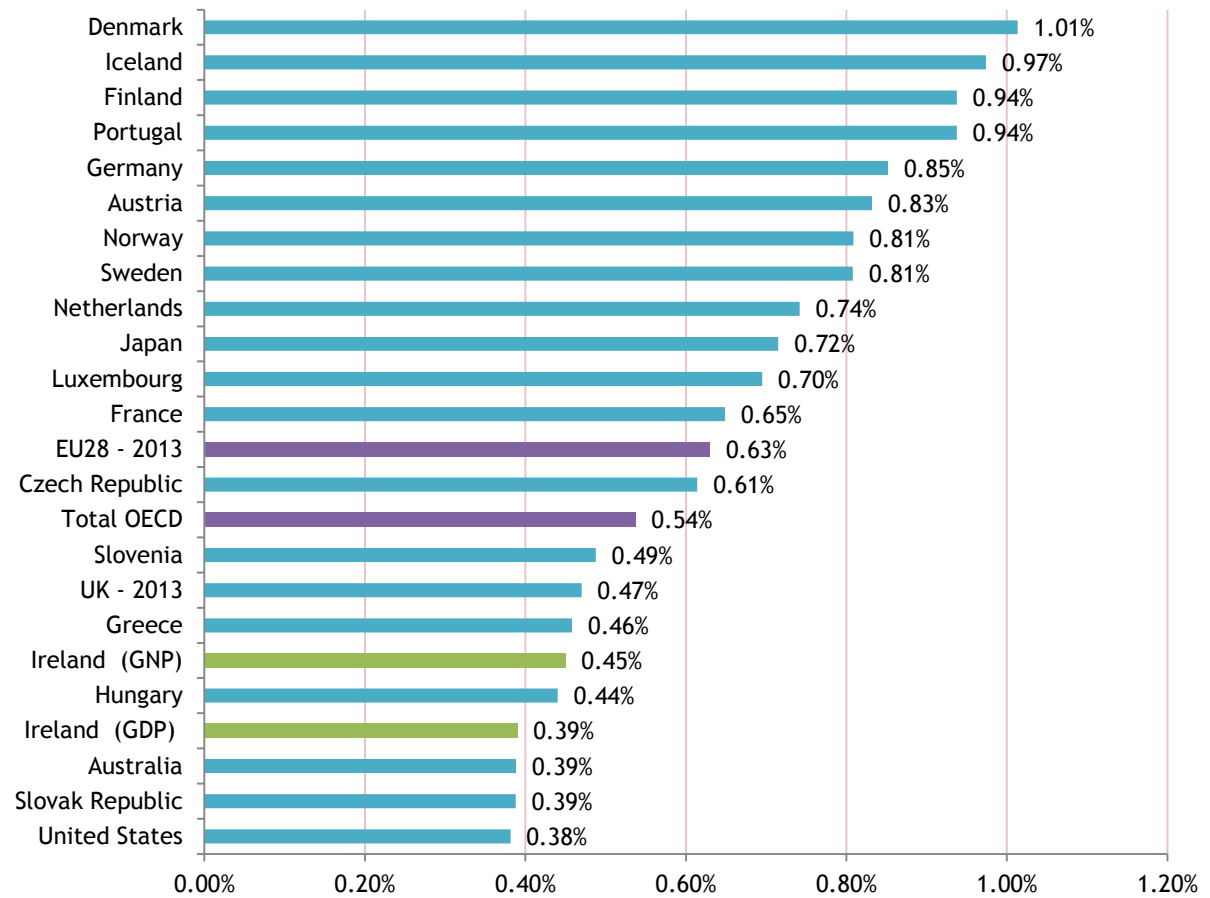
From 2009 there has been a reduction in allocated R&D funds and a decrease in the R&D intensity level. GNP has risen since 2011 which is also contributing to the continuing decline in the intensity level. Despite an increase in allocated funding for R&D activities in 2015<sup>10</sup> the intensity level is expected to amount to 0.43% of GNP.

<sup>9</sup> Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development, OECD, Paris, 2002 [www.oecd.org/sti/frascaticmanual](http://www.oecd.org/sti/frascaticmanual)

<sup>10</sup> GNP 2015 - forecast €169,179m; GDP 2015 - forecast €197,530, Central Bank, Quarterly Bulletin Q3 -2015 <http://www.centralbank.ie/polstats/econpolicy/Pages/quarterly.aspx>

## 1.5 International Comparison of GBAORD as a percentage of GDP, 2014

Figure 5: International comparison of GBAORD as a % of GDP/GNP (2014\*)<sup>11</sup>



\* Data refers to 2014 except for Total EU28 and U.K. where the latest available data is for 2013

Denmark, with GBAORD spending of 1.01% of GDP, is one of the strongest performing OECD countries.

In 2014, the Irish government allocated 0.45% of GNP on research and development or 0.39% of total GDP.

The average level of investment intensity of our European partners was 0.63% in 2013 - the latest year for which data is available.

In 2014, the OECD average intensity rate of GBAORD as a percentage of GDP was 0.54%.

### 'Civil GBAORD'

*The GBAORD figures used in these graphs are 'civil' GBAORD and are used for international comparisons as they exclude the defence portion of a Government's R&D budget. There is no allocation for defence purposes in the Irish GBAORD figures.*

<sup>11</sup> OECD - Main Science & Technology Indicators, July 2015, Vol. 2015/1.  
<http://www.oecd.org/sti/msti.htm>



**Table 3: GBAORD as a percentage of economic activity (GDP/GNP) (2005 & 2014)**

Country	2005	2014
Denmark	0.69%	1.01%
Iceland	0.85%	0.97%
Finland	0.95%	0.94%
Portugal	0.68%	0.94%
Germany	0.71%	0.85%
Austria	0.64%	0.83%
Norway	0.65%	0.81%
Sweden	0.68%	0.81%
Netherlands	0.74%	0.74%
Japan	0.68%	0.72%
Luxembourg	0.26%	0.70%
France	0.75%	0.65%
<b>EU28 (OECD est.) 2013</b>	<b>0.60%</b>	<b>0.63%</b>
Czech Republic	0.49%	0.61%
<b>Total OECD</b>	<b>0.53%</b>	<b>0.54%</b>
Slovenia	0.54%	0.49%
UK - 2013	0.49%	0.47%
Greece	0.32%	0.46%
<b>Ireland (GNP)</b>	<b>0.49%</b>	<b>0.45%</b>
Hungary	0.41%	0.44%
<b>Ireland (GDP)</b>	<b>0.43%</b>	<b>0.39%</b>
Australia	0.48%	0.39%
Slovak Republic	0.25%	0.39%
United States	0.43%	0.38%

Countries listed are those that have published data for 2005 and 2014 with the exception of the UK and EU28 where the latest data relates to 2013.

In Ireland, the GBAORD intensity ratio decreased in this period for GNP from 0.49% to 0.45% and for GDP from 0.43% to 0.39%.

The EU28 intensity level has remained relatively consistent over this period standing at 0.60% of GDP in 2005 and 0.63% 2013.

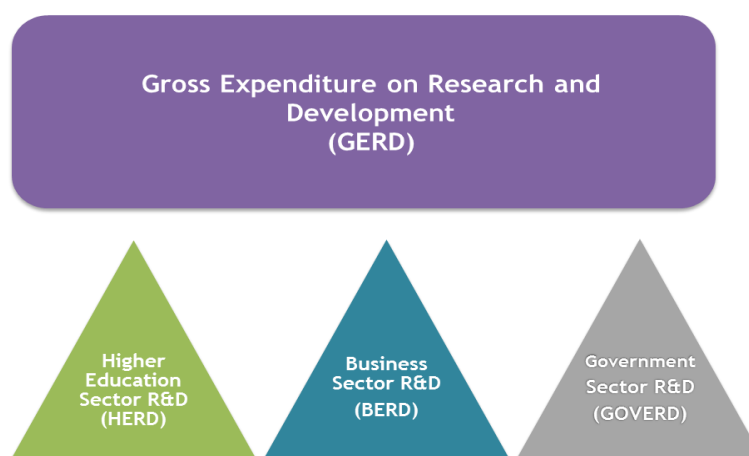
## Chapter 2: Gross Expenditure on R&D (GERD)

### Gross Expenditure on R&D (GERD)

*GERD is defined as the total expenditure (current and capital) on R&D carried out by all resident companies, research institutes, university and government laboratories, etc., in a country. It includes R&D funded from abroad but excludes domestic funds for R&D performed outside the domestic economy.*

Source: OECD - MSTI

**Figure 6: Gross Expenditure on R&D (GERD)**



GERD is estimated by combining survey data from the following surveys:

**1. Business Sector: (BERD - Business Expenditure on R&D)**

The Business Expenditure on Research and Development (BERD) Survey is a survey of the research and development activities of enterprises in Ireland and other EU Member States. Data is collected every two years by the Central Statistics Office (CSO) and results are available on the CSO website - [www.cso.ie](http://www.cso.ie).

**2. Higher Education Sector: (HERD - Higher Education R&D)**

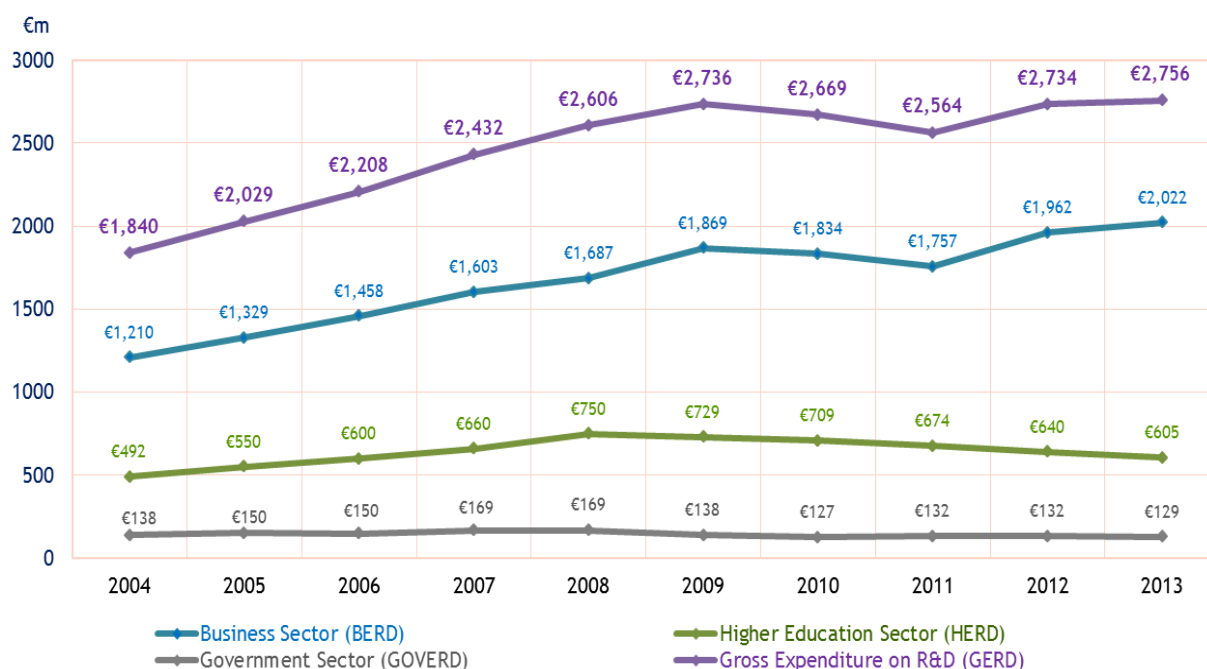
The Higher Education Research and Development (HERD) Survey is a survey of the research and development activities of third level institutions in Ireland and other EU Member States. Survey data is collected every two years by the Dept. of Jobs, Enterprise & Innovation and is made available on the DJEI website - [www.djei.ie](http://www.djei.ie).

**3. Government Sector: (GOVERD - Government R&D)**

This data comes from the survey underpinning this report the - 'Research & Development Funding and Performance in the State Sector 2014-15' survey. See Appendix 6 for copy of questionnaire and Chapter 4 for more detailed results.

## 2.1 Gross expenditure on Research and Development (GERD) by Sector

**Figure 7: Gross Expenditure on Research and Development (GERD), (2004-2013)  
(Government + Business + Higher Education Sectors)**



In 2013, GERD increased to €2,756m and is at its highest level in the 10 years of this time-series and shows a 50% increase over the 2004 figure of €1,840m.

GERD is the sum of R&D expenditure in the business, higher education and government sectors.

- The highest expenditure on R&D continues to be in the business<sup>12</sup> sector where €2,022m was invested in research programmes in 2013. Despite a reduction in spending in 2010 and 2011 there has been a steady increase in expenditure in the business sector since 2004. The 2013 figure of €2,022m represents a 67% increase over the 2004 figure of €1,210m
- The higher education<sup>13</sup> sector has seen a decline in R&D expenditure since 2008 and was estimated to stand at €605m in 2013.
- The Government sector is the smallest sector with €129m of research being carried out in 2013 in government institutions e.g. Teagasc, The Marine Institute etc. (Government sector figures include an estimate for government funded Hospital performed R&D).

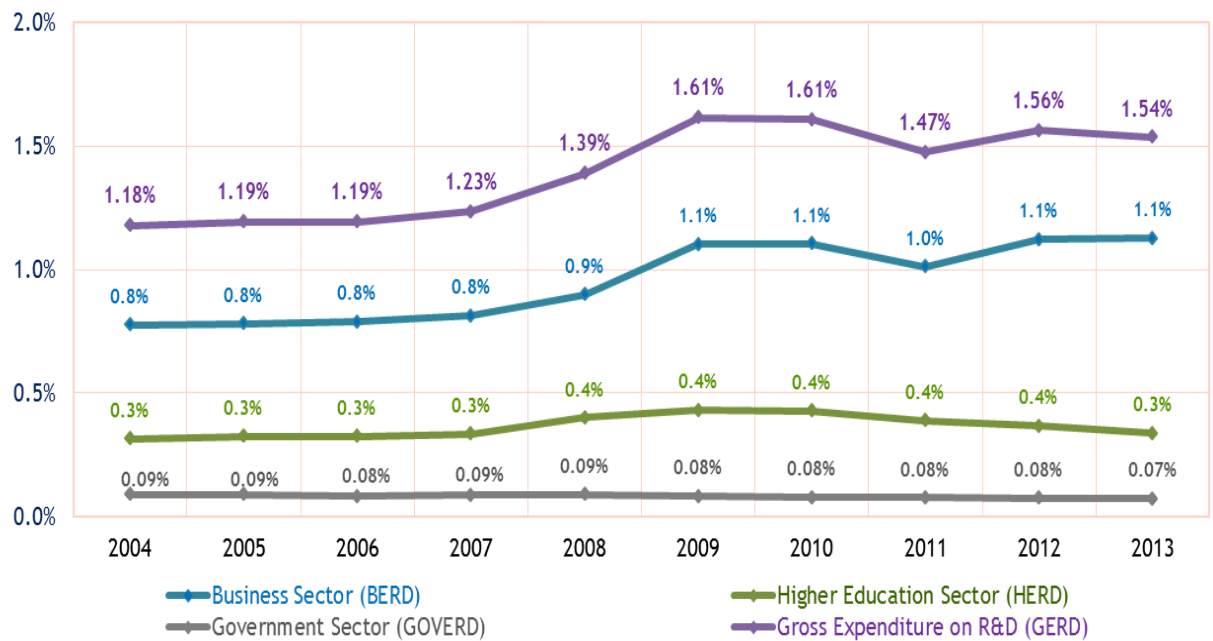
<sup>12</sup> Business Expenditure on R&D 2013-2014'

<http://www.cso.ie/en/releasesandpublications/er/berd/businessexpenditureonresearchdevelopment2013-2014/>

<sup>13</sup> Research and Development in the Higher Education Sector 2012-2013'

<https://www.djei.ie/en/Publications/Survey-of-Research-and-Development-in-the-Higher-Education-Sector-2012-2013.html>

**Figure 8: Gross Expenditure on Research and Development (GERD) as a percentage of GDP (2004-2013)**



Gross Expenditure on R&D expressed as a percentage of GDP<sup>14</sup> stood at 1.54% in 2013.

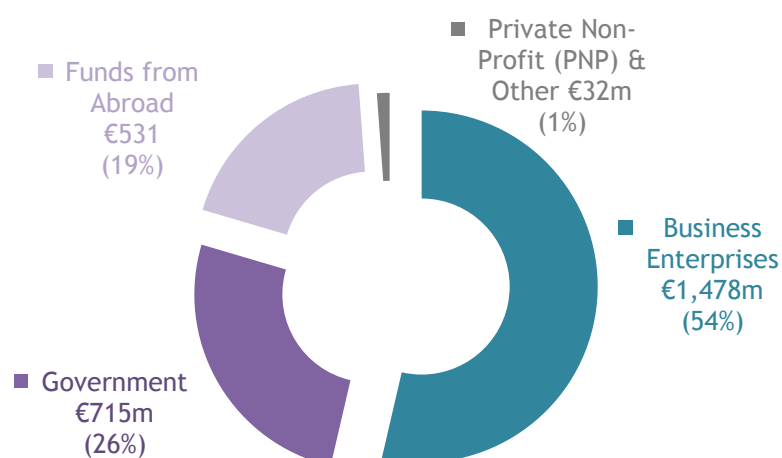
As a percentage of GDP, Gross Expenditure on Research and Development has fallen in the last three years from a previous high of 1.61% in 2010. While the actual amount of R&D investment has increased over this period, GDP has also been increasing.

As a percentage of GDP, expenditure in the business sector has been maintained at 1.1% since 2009.

<sup>14</sup> CSO- Stat Bank N1406: 86. Gross Domestic Product at current market prices - Aug 15

## 2.2 GERD - Source of R&D funds

Figure 9: GERD - Source of funds - 2013



GERD is the sum of R&D expenditure in the business, higher education and government sectors and this section examines the source of those R&D funds flowing into all those sectors of the economy.

The majority or 54% of R&D funding come from business with a total investment of €1,478m in 2013. In addition, there are also some funds from businesses included in the 'Funds from Abroad' source.

The Government's investment in research and development in 2013 amounted to 26% of total expenditure at €715m.

### Sources of Funds - definitions

- *Funds from Business Enterprise Sector: own enterprise; other enterprise in the same group; other enterprise*
- *Funds from Government Sector: direct government funding.*
- *Funds from Abroad: (includes funds invested in R&D in this country but sourced outside the State) European Commission; Business enterprise within the same group or other enterprises; Other national governments; PNP; International organisations.*
- *Funds from Private Non-Profit Sector / Other e.g. higher education*

Frascati Manual, OECD 2002

**Figure 10: GERD - Source of funds (2004-2013)**

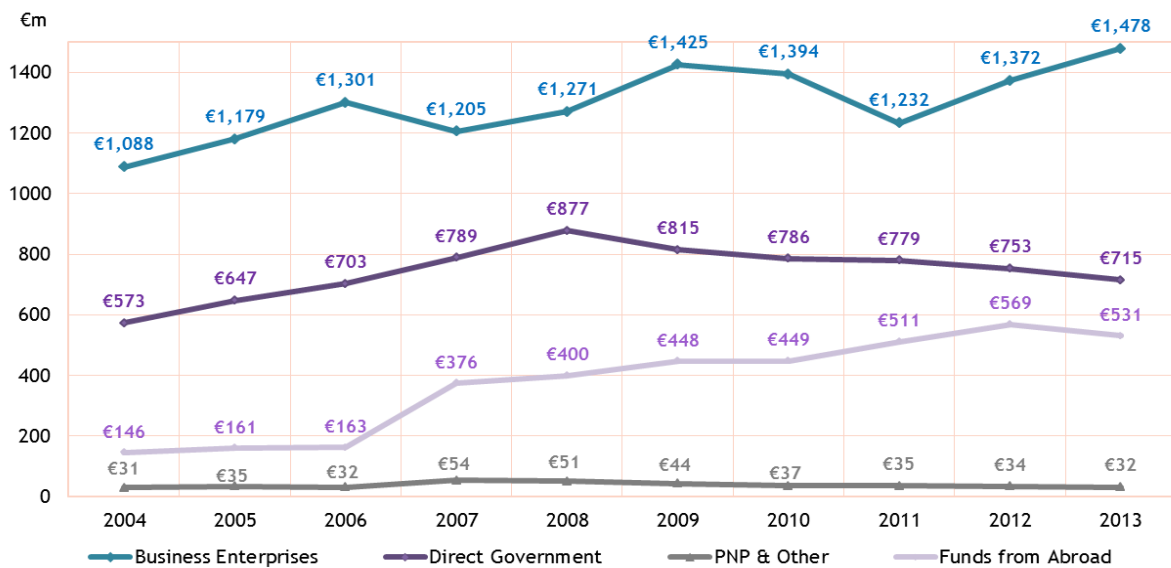


Figure 10 charts R&D funding sources since 2004 and shows the continuing importance of business funding. Since 2007, there has been an increase in R&D funding coming into the country from abroad though this has fallen in 2013.

**Figure 11: Source of total GERD funds by Sector - 2013**

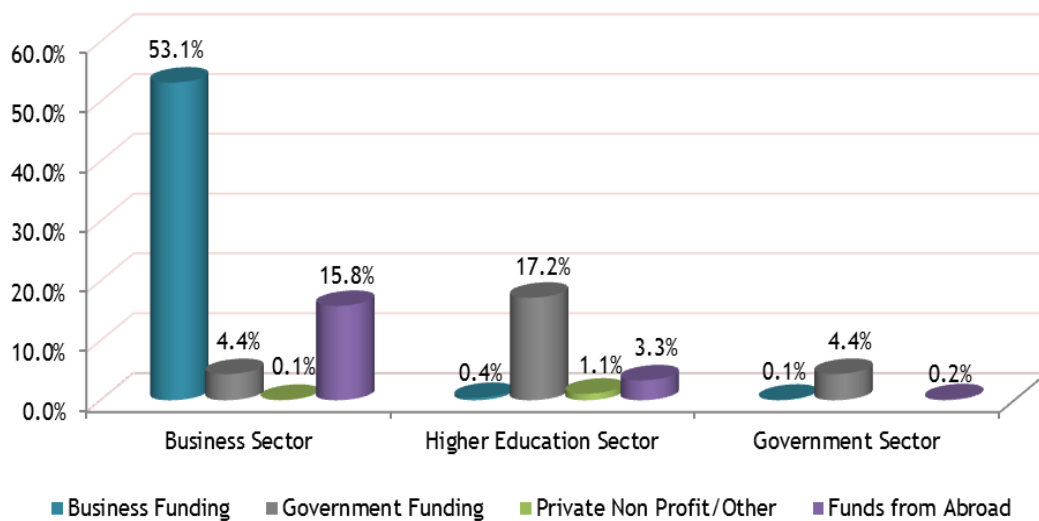


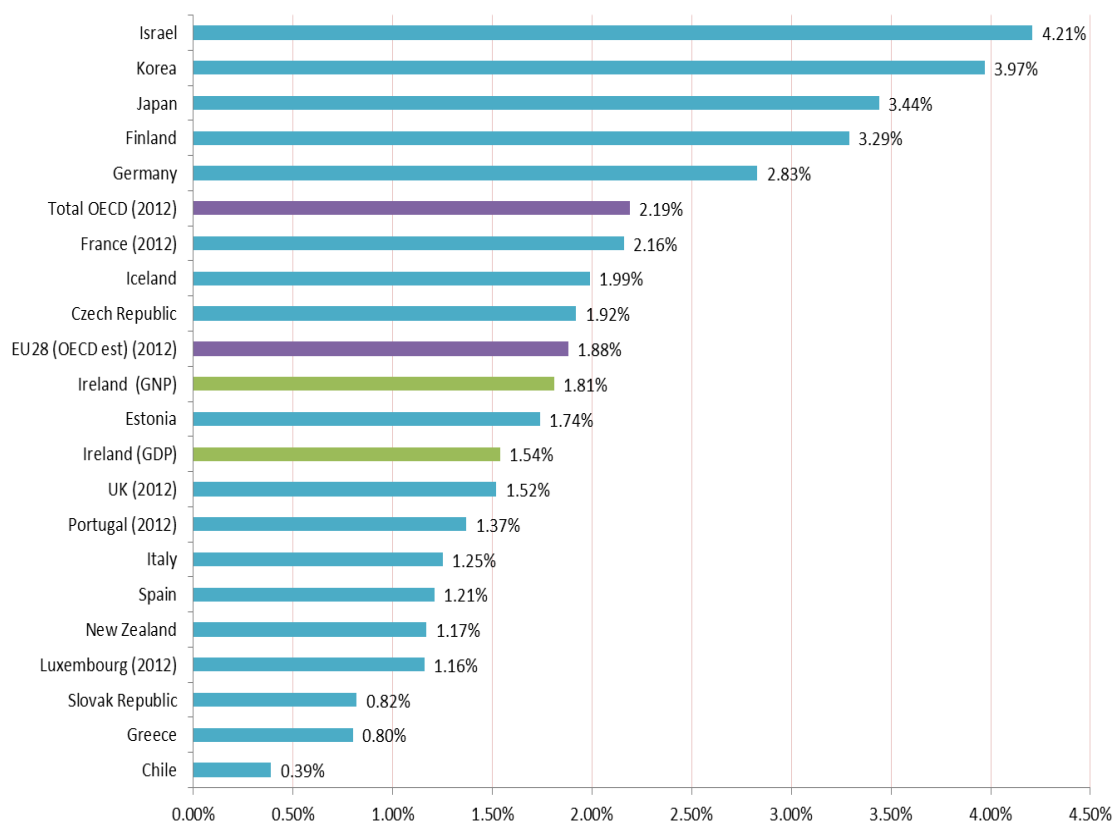
Figure 11 breaks down the source of funds further - this time by performing sector. The percentages are funding levels as a percentage of total R&D funds.

The majority of R&D funds in the Business sector are from their own company resources. Companies also source funds from other parts of their company outside the State. The bulk of R&D funding in the Higher Education sector is through direct Government funding.

The majority or 94% of funding for Government agencies engaged in R&D comes from the Government and this represents 4.4% of total R&D funds.

### 2.3 GERD as a percentage of GDP - International Comparison

Figure 12: GERD as a % of GDP - International comparison, 2013



'Estimated Civil GERD<sup>15</sup> as a % of GDP' (excludes defence expenditure)

In Figure 12, GERD (Gross Expenditure on R&D) as a percentage of GDP and GNP<sup>16</sup> in Ireland is compared with GERD as a percentage of GDP in countries where data is available. Where 2013 figures were not available, 2012 data has been included.

Gross expenditure on R&D in Ireland as a percentage of GDP was 1.54% in 2013. The estimated EU (28 countries) average was 1.88% for civil GERD in 2012 and 1.92% including defence spending.

#### Europe 2020 Strategy

*“One of the key objectives of the EU during the last decade has been to encourage increasing levels of investment, in order to provide a stimulus to the EU’s competitiveness. The Lisbon strategy set out for the EU an objective of devoting 3% of its gross domestic product (GDP) to R & D activities by 2010. The target was not reached – and subsequently the 3% target was maintained, forming one of five key targets within the Europe 2020 strategy adopted in 2010.”*

Eurostat - Statistics Explained<sup>17</sup>

<sup>15</sup> OECD - Main Science & Technology Indicators, July 2015, Vol. 2015/1

<http://www.oecd.org/sti/msti.htm>

<sup>16</sup> GNP is included as a denominator for Ireland as it excludes the large multinational base in Ireland which repatriates profits to their respective home countries.

<sup>17</sup> Eurostat - [http://ec.europa.eu/eurostat/statistics-explained/index.php/R\\_%26\\_D\\_expenditure](http://ec.europa.eu/eurostat/statistics-explained/index.php/R_%26_D_expenditure)

## Chapter 3: R&D Personnel in All Sectors

This chapter combines the results of three surveys to provide an overall summary of R&D personnel working in Ireland.

### Data Sources for R&D Personnel numbers

#### 1. Business Sector: (BERD - Business Expenditure on R&D)

Data is collected every two years by the Central Statistics Office (CSO) and results are available on the CSO website - [www.cso.ie](http://www.cso.ie).

#### 2. Higher Education Sector: (HERD - Higher Education R&D)

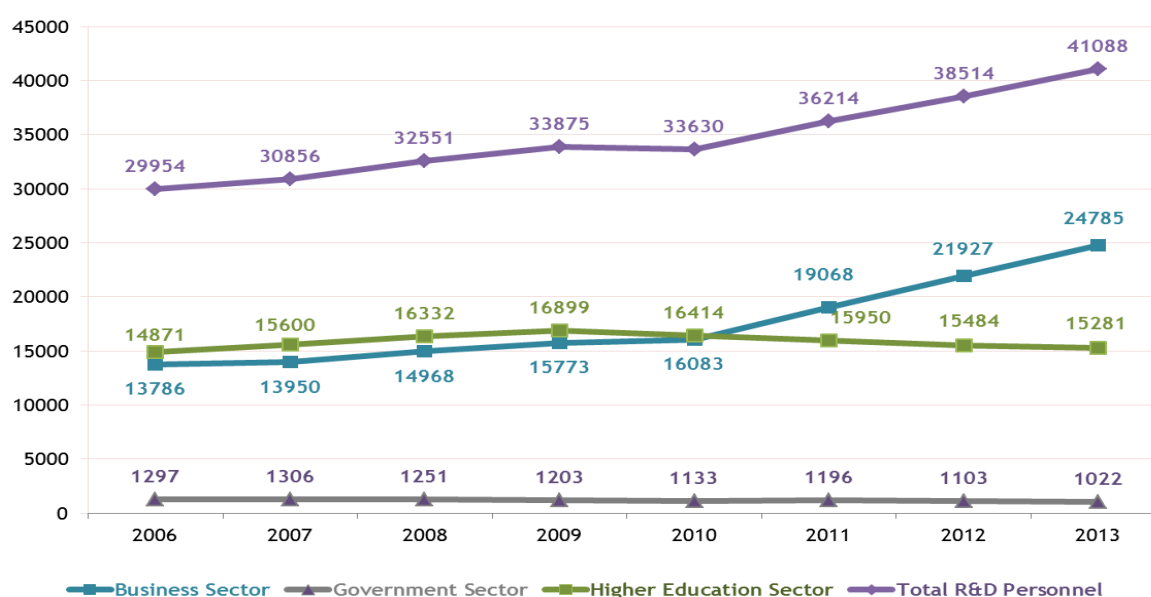
Data is collected every two years by the Dept. of Jobs, Enterprise & Innovation and results are available on the DJEI website - [www.djei.ie](http://www.djei.ie).

#### 3. Government Sector: (GOVERD - Government R&D)

This data comes from the survey underpinning this report the 'Research & Development Funding and Performance in the State Sector 2014-15' survey. See Chapter 4 for more details.

### 3.1 R&D Personnel in all Sectors

Figure 13: R&D Personnel in Ireland by Sector 2006-2013



There are a total of 41,088 personnel involved in R&D across all the sectors of the economy and, of these, 60% or 24,785 are working in the business sector.

Overall there has been a steady increase in the number of R&D personnel since 2006 with the largest increase in personnel being employed solely in the business sector.



### 3.2 R&D Personnel by Sector and Gender

This chart breaks down the number of R&D Personnel employed in 2013 by sector and then by gender. The chart shows the percentage of R&D personnel of the total population.

- 46% of total R&D personnel are men working in the business sector
- Approximately the same number of men and women are employed as R&D personnel in the Higher Education sector
- The number of male R&D personnel outnumbers female personnel by a factor of 2:1.

Figure 14: R&D Personnel by Sector and Gender, 2013

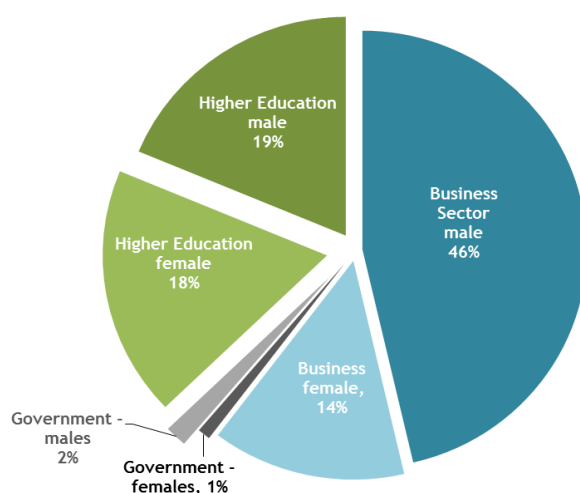


Table 4: R&D Personnel by Sector and Gender, 2013

Total R&D Personnel - all sectors	2013		
	Male	Female	Total
Business Sector	19,049	5,736	24,785
Higher Education Sector	7,690	7,592	15,281
Government Sector	646	376	1,022
Total	27,385	13,704	41,088

### 3.3 R&D Personnel by Sector and Occupation

Figure 15: R&D Personnel by Sector and Occupation, 2013

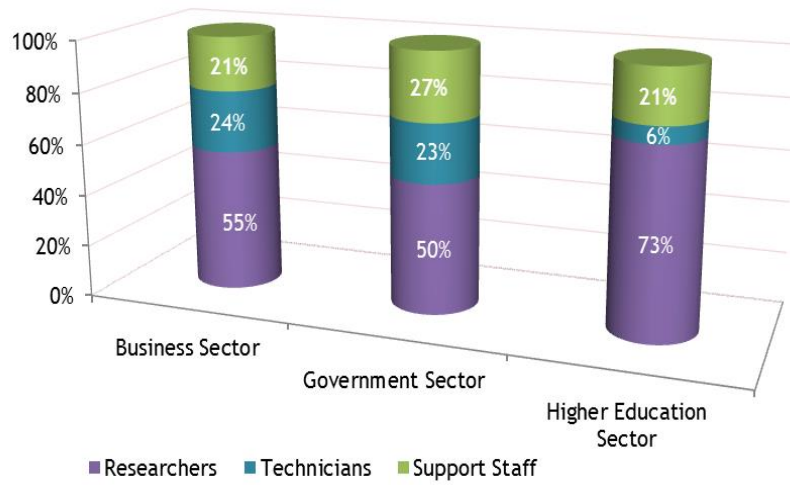


Table 5: R&D Personnel by Sector and Occupation, 2013

Total R&D Personnel - all sectors	2013			
	Researchers	Technicians	Support Staff	Total
Business Sector	13,750	5,893	5,142	24,785
Government Sector	516	234	272	1,022
Higher Education Sector	11,127	990	3,165	15,281
Total	25,393	7,117	8,579	41,088

Over 60% of all R&D Personnel are employed in the Business Sector, a total of 24,785 R&D personnel.

- The majority or 55% of business sector R&D personnel are researchers.

The Higher Education Sector employ 15,281 R&D personnel or 37% of the total numbers employed.

- The majority at 73% of Higher Education Sector R&D personnel are researchers.

The Government Sector accounts for 1,022 or 3% of total R&D personnel numbers.

## Chapter 4: Government Sector R&D

This chapter examines in more detail R&D carried out specifically in the Government Sector.

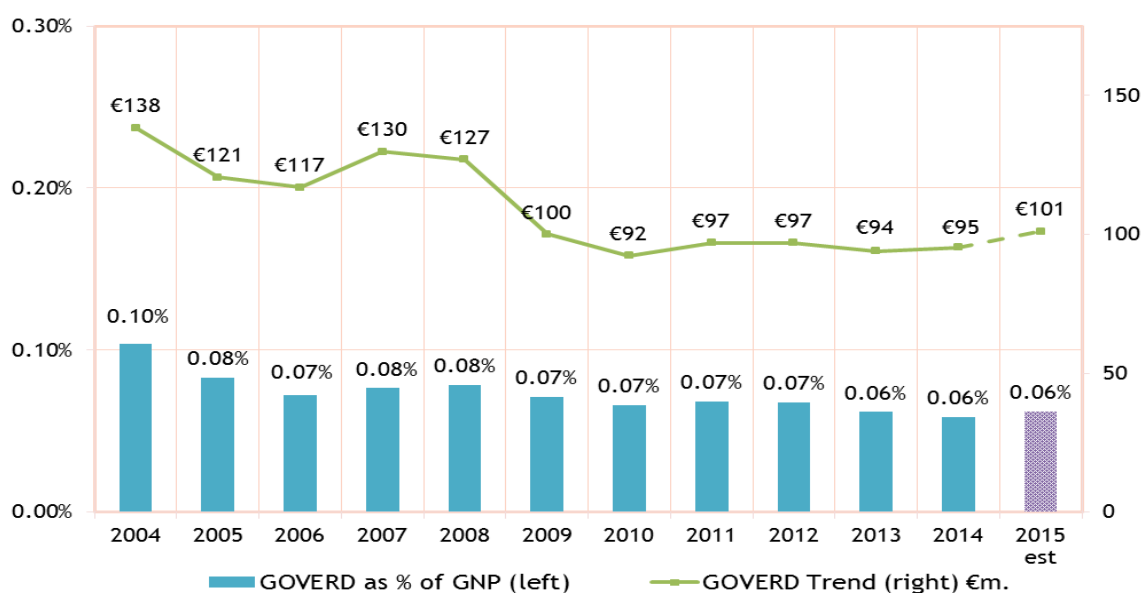
Data for this chapter comes from the results of the 'State Investment in R&D 2013-14' survey. A copy of the questionnaire is attached to this report - Appendix 6.

### 4.1 Government Sector (GOVERD) R&D 2004-2015

Government sector Expenditure on R&D (GOVERD) is the R&D carried out directly by Government Departments and State Agencies.

Research and Development carried out in the Government Sector represents less than 5% of the total Gross Expenditure on R&D (GERD)<sup>18</sup> for Ireland.

**Figure 16: GOVERD trend (€m) and GOVERD as a percentage of GNP (2004-2015)**



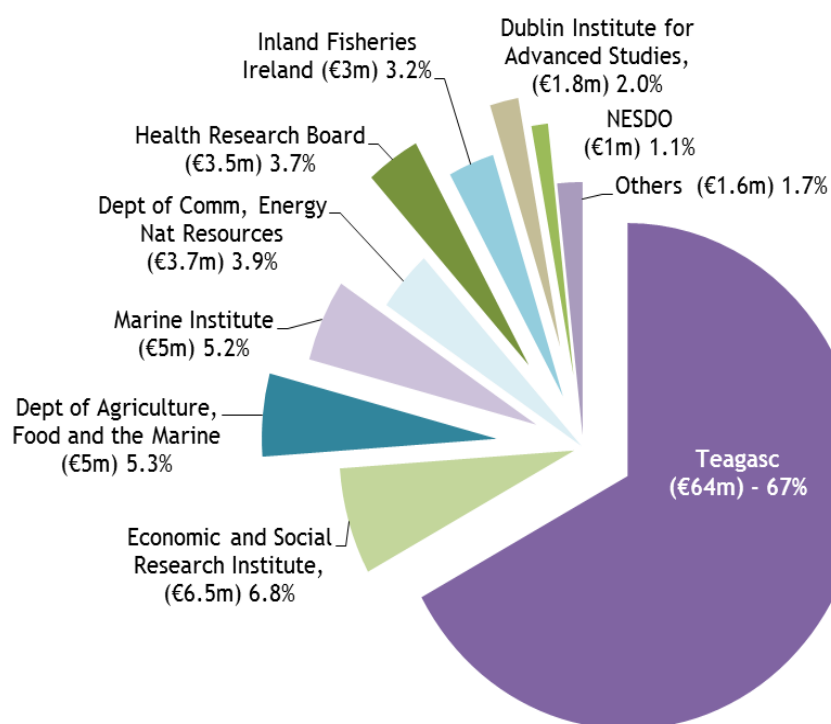
Government Sector R&D amounted to €95m in 2014 in line with the previous four years and is anticipated to rise to €101m in 2015.

When measured as a percentage of GNP, expenditure on R&D in the Government Sector has been maintained between 0.08% and 0.06% since 2005.

<sup>18</sup> GOVERD total in GERD - An additional estimate for state funded Hospital R&D is included in the GERD results.

## 4.2 Government Sector - R&D performers, 2014

Figure 17: Major Government Sector R&D performers in 2014



This chart shows the main R&D performers in the Government Sector i.e. R&D carried out by Government employees in Government agencies and departments.

As can be seen, Teagasc, the Irish agriculture and food development authority, continued to be the largest performer of Government R&D (GOVERD) in 2014, with expenditure of €64m. This represents 67% of total GOVERD (excluding Hospital R&D) which reached €95m in 2014. Teagasc supports science-based innovation in the agri-food and broader bio-economy sectors. A significant proportion of the Teagasc research spend is provided for through the annual grant-in-aid funding support that comes directly from the Department of Agriculture, Food and the Marine.

Other major contributors include the Economic and Social Research Institute at €6.5m (6.8%) and the Department of Agriculture, Food and the Marine at €5m (5.3%).

The contribution to Government Sector R&D from the Marine Institute is €5m (5.2%). The remaining contributors comprise 15.6% of state R&D at a total of €14.8m in 2014.

### 4.3 Government Sector by Type of Research and Fields of Science, 2014

**Table 6: GOVERD - Field of science classified by type of research, (2014) €m.**

Field of Science	2014			
	Type of Research			
	Basic €m	Applied €m	Experi- mental €m	Total €m
Agriculture, forestry, fisheries & veterinary	17.2	51.8	7.8	76.8
Economics & business	0.0	8.1	0.0	8.1
Health sciences	0.0	3.5	0.0	3.5
Electrical engineering, electronics	0.0	0.0	3.5	3.5
Physical sciences	1.8	0.0	0.0	1.8
Earth and related environmental sciences	0.1	0.3	0.2	0.7
Educational sciences	0.0	0.5	0.0	0.5
Social & economic geography	0.1	0.2	0.1	0.4
Totals	€19.2m	€64.4m	€11.6m	€95.2m

The type of research being performed in the various Government departments and agencies is broken down by categories of research and Field of Science. The majority of funds spent on research performed in the public sector is spent on applied research; this amounted to 68% or €64.4m out of a total spend of €95.2m.

Agricultural science is the field of science in which most expenditure takes place. In 2014, €51.8m was spent on applied science in this area with €17.2m on basic research and another €7.8m spent on experimental development. The major performer of R&D in the Government Sector is Teagasc which, along with the Department of Agriculture, Food and the Marine are engaged in the field of agricultural and fisheries sciences. Other agencies working in this field are Bord Iascaigh Mhara, the Inland Fisheries Board and the Marine Institute.

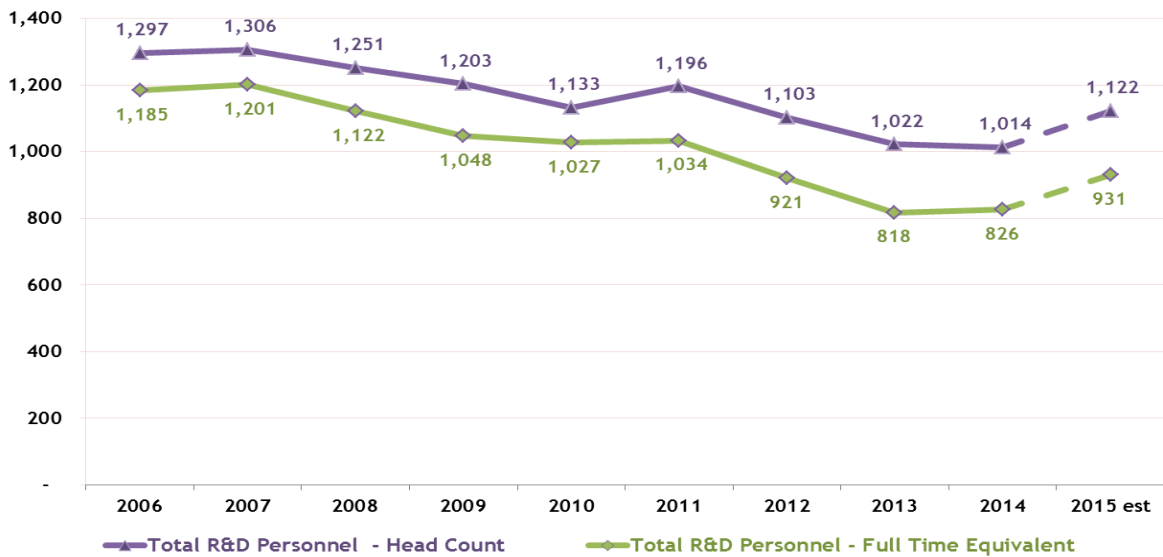
#### Types of Research

- *Basic Research - experimental or theoretical work undertaken primarily to acquire new knowledge, without any particular application or use in view;*
- *Applied Research - original investigation undertaken in order to acquire new knowledge, primarily directed towards a specific practical aim or objective;*
- *Experimental Development - systematic work, drawing on existing knowledge gained from research and practical experience that is directed at producing new materials, products and devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.*

OECD Frascati Manual

#### 4.4 Government Sector R&D personnel

**Figure 18: Government Sector R&D Personnel 2006-2015 (Head Count + Full Time Equivalent)**



The top line on this graph traces the total number of R&D Personnel employed in the Government Sector since 2006. Numbers have fallen over the period of this time-series though estimated numbers for 2015 indicate a reverse in this trend.

The second trend line shows the Full-Time Equivalent numbers for the same period - (see definition on next page).

**Figure 19: Government Sector Researchers 2006-2015 (Head Count + Full Time Equivalent)**



The R&D personnel numbers include technical, support, administrative and managerial staff, this graph focuses in on the researchers working in the Government Sector. There were 544 researchers in the Government Sector in 2014 and of the full-time equivalent number of researchers in 2014 was 461. It is estimated that this number will rise by 2% in 2015.

Figure 20: Government Sector R&amp;D Personnel (FTE) by Occupation - Gender, 2014

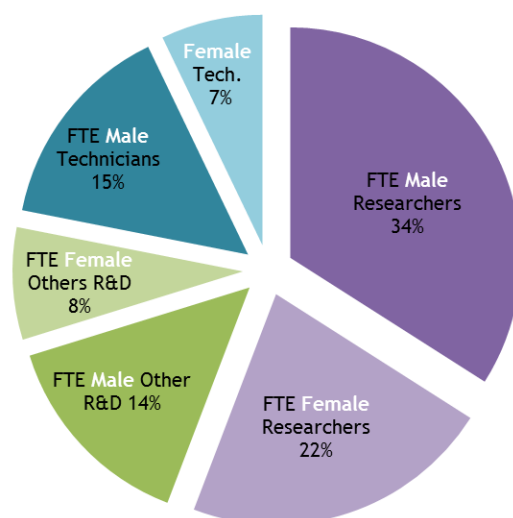


Table 7: Government Sector R&amp;D Personnel by gender and occupation, FTEs (2014)

Government Sector R&D Personnel	2014		
	Male	Female	Total by Occupation
Full-time Equivalent (FTE)			
Researchers	281	180	461
Technicians	122	59	181
Other Support Staff	119	65	184
Total by Gender	522	304	826

This graph and table show that the majority or 56% of R&D personnel in the Government Sector were researchers in 2014.

The majority of researchers were male, numbering 281 out of a total of 461 researchers.

These are the full-time equivalent numbers for researchers.

#### **Full-Time Equivalent (FTE)**

*'One FTE may be thought of as one person-year. Thus, a person who normally spends 30% of their time on R&D and the rest on other activities (such as teaching or administration) should be considered as 0.3 FTE'*

Frascati Manual - Paragraph 333

**Table 8: Government Sector R&D Personnel by gender and field of science, FTEs (2014)**

Fields of Science	Male researchers (FTE)	As % of all male researchers	Female researchers (FTE)	As % of all female researchers
Agriculture, forestry and fisheries	172	61.3%	96	53.9%
Physical sciences	37	13.2%	8	4.4%
Economics and business	35	12.5%	32	17.8%
Electrical Engineering, electronics	25	8.9%	6	3.1%
Earth & related environmental	5	1.9%	6	3.3%
Health sciences	3	1.1%	25	13.9%
Veterinary science	3	0.9%	2	0.8%
Educational sciences	1	0.4%	4	2.4%
Social & economic Geography	0	0.0%	1	0.3%
<b>Total</b>	<b>281</b>	<b>100%</b>	<b>180</b>	<b>100%</b>

When analysed by the OECD standard fields of science<sup>19</sup>, the following statistics emerge for 2014.

The majority of the Government researchers work in the ‘agricultural, forestry and fisheries’ field. Some 61.3% of all male researchers and 53.9% of female researchers are engaged in research and development work in this area.

For male researchers, the next two largest areas of research are ‘physical sciences’ with 13.2% and ‘economics and business’ with 12.5%.

For women, the next two significant areas of research are ‘economic & business’ with 17.8% and the ‘health sciences’ with 13.9%.

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<sup>19</sup> ‘Revised Field of Science and Technology (FOS) Classifications in the Frascati Manual’, Feb 2007, OECD <http://www.uis.unesco.org/ScienceTechnology/Documents/38235147.pdf>



## Appendix 1

### Methodology for GBAORD and GOVERD data

The information given in this report for GBOARD and GOVERD data relates to information supplied by 35 institutions in receipt of monies from the exchequer for the performance or support of research and development.

- Expenditure data for specific programmes refer to the 2014 outturn costs of programmes and to expected expenditure in 2015.
- Expenditures are based on unaudited figures, except in a few cases where they are identical with a vote by the Oireachtas. For convenience, general overheads, where shown, are distributed in proportion to programme expenditures.
- Programmes are attributed to the institution most directly involved - that is to those actually operating them, but not necessarily funding them. An example of the latter is the Department of Jobs, Enterprise and Innovation which funds, but does not operate or manage research programmes. Only their own administrative costs are attributed to the funding institutions in such cases.

Apportionment problems arise in the third level sector, mainly from the monies distributed by the Higher Education Authority (HEA) and the Department of Education and Skills through its recurrent core funding - general university funds (GUF). This core grant is allocated as a block grant to cover core teaching and research activities within institutions - the internal allocation of funds between teaching and research are at present a matter for each institution.

#### General University Funds (GUF) - core grant

- The allocation of the core grant is determined on a formula basis. The allocation is based on a standard per capita amount in respect of weighted EU student numbers in four subject price groups. Student numbers in the four groups are weighted to reflect the relative cost of the subject groups. A further weighting is given for research students. Further details on the next page.
- 5% is also top-sliced from the aggregate grant for all higher education institutions exclusive of the grant in lieu in tuition fees. This top-sliced amount is allocated as follows -
  - 75% in proportion to proportion of Ph.D. and Masters research degrees awarded
  - 25% in proportion to proportion of research income per academic staff member, earned by each institution.

This top-slice does not oblige HEIs to spend this amount on research - the internal allocation of the core grant is still a matter for each institution.

### General University Funds - weighting:

Subject Price Group	Subject Group Weighting
Clinical stages of undergraduate medicine	2.3
Undergraduate dentistry, veterinary	4
Laboratory-based subjects (Science, Engineering, Pre-clinical Medicine & Dentistry)	1.7
Postgraduate Research 1.6 x 3 (i.e.4.8)	
Subjects with a studio, laboratory or fieldwork element	1.3
Postgraduate Research 1.3 x 3 (i.e. 3.9)	
All other subjects	1
Postgraduate Research 1 x 3 (i.e. 3)	

### Institutes of Technology - core grant

- Annual funding provided by the State via the HEA for the purposes of funding the recurrent activities of Institutes of Technology (IoTs).
- This core grant is allocated as a block grant to cover core teaching and research activities within institutions - the internal allocation of funds as between teaching and research is at present a matter for each institution. A new funding model similar to the funding model used for the University sector has been developed for the IoTs.
- The new model follows the principles of the Recurrent Grant Allocation Model (RGAM), whereby funding follows students, with provisions made for broad differences in the costs of the type of education being pursued by the student. There are some differences in the weightings attached to research in the IoT sector. The weightings are summarised below.

### Institutes of Technology - weighting:

Subject Price Group	Weighting
Laboratory-based subjects (Science, Engineering, Pre-clinical Medicine & Dentistry)	1.7
Postgraduate Research 1.8 (i.e. 1.8 x 1.7 = 3.06)	
Subjects with a studio, laboratory or fieldwork element	1.3
Postgraduate Research 1.8 x (i.e. 1.8 x 1.3 = 2.34)	
All other subjects	1
Postgraduate Research 1.8 x 3 (i.e. 1.8 x 1 = 1.8)	

## Appendix 2

### Definition of Research & Development

For the purpose of this survey research and development is defined as:

**Research:**

- Original, experimental or theoretical investigations undertaken to acquire new knowledge, with or without a particular application or use in view.

**Development:**

- Systematic work drawing on existing knowledge gained from research and/or practical experience that are directed to producing new products, processes, systems, services, varieties and breeds and to improving substantially already existing ones.
- Data collection conducted solely or primarily as part of the research and development (R&D) process included under “research” or “development” as appropriate.

These definitions are in accordance with the standard practice for surveys on research and development set out in the ‘Frascati Manual - OECD, 2002’<sup>20</sup>

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<sup>20</sup> Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development, OECD, Paris, 2002 [www.oecd.org/sti/frascaticmanual](http://www.oecd.org/sti/frascaticmanual)

## Appendix 3

### Government Departments and Agencies included in the 2014-2015 ‘R&D Funding and Performance in the State Sector’ survey

Government Departments	Associated Agencies
Department of Agriculture, Food and the Marine	Bord Iascaigh Mhara Marine Institute Teagasc
Department of Arts, Heritage and the Gaeltacht	Údarás na Gaeltachta
Department of Communications, Energy and Natural Resources	Inland Fisheries Ireland Sustainable Energy Authority of Ireland
Department of Education and Skills	Dublin Institute for Advanced Studies SOLAS Higher Education Authority Irish Research Council
Department of Jobs, Enterprise & Innovation	Enterprise Ireland Forfás (Integrated with DJEI, 2014) IDA Ireland InterTradelreland Science Foundation Ireland
Department of the Environment, Community and Local Government	Environmental Protection Agency Radiological Protection Institute of Ireland (Integrated with EPA, 2014) Met Éireann
Department of Public Expenditure & Reform	Economic and Social Research Institute
Department of Health	Health Research Board
Department of the Taoiseach	National Economic and Social Council
Department of Transport, Tourism and Sport	National Roads Authority
Offices	Central Bank and Financial Services Authority of Ireland Office of Public Works

## Appendix 4

### Acronyms

<b>BERD</b>	Business Expenditure on R&D
<b>DAFM</b>	Department of Agriculture, Food and the Marine
<b>DIAS</b>	Dublin Institute for Advanced Studies
<b>DJEI</b>	Department of Jobs, Enterprise and Innovation
<b>EPA</b>	Environmental Protection Agency
<b>ESRI</b>	Economic and Social Research Institute
<b>FOS</b>	Field of Science
<b>FTE</b>	Full Time Equivalent
<b>GBAORD</b>	Government Budget Appropriations or Outlays on R&D
<b>GDP/GNP</b>	Gross Domestic Product / Gross National Product
<b>GERD</b>	Gross Expenditure on R&D
<b>GOVERD</b>	Government Expenditure on R&D
<b>GUF</b>	General University Funds
<b>HEA</b>	Higher Education Authority
<b>HERD</b>	Higher Education Expenditure on R&D
<b>HC</b>	Head Count
<b>HRB</b>	Health Research Board
<b>IRC</b>	Irish Research Council
<b>NESC</b>	National Economic and Social Council
<b>NRA</b>	National Roads Authority
<b>OECD</b>	Organisation for Economic Co-operation & Development
<b>OPW</b>	Office of Public Works
<b>OST</b>	Office of Science and Technology - Department of Jobs, Enterprise and Innovation
<b>PRTL</b>	Programme for Research in Third Level Institutions
<b>SEAI</b>	Sustainable Energy Authority of Ireland
<b>SFI</b>	Science Foundation Ireland

## Appendix 5:

### Government Departments & Agencies' R&D Programmes

#### Department of Agriculture, Food and the Marine

The Department of Agriculture, Food and the Marine (DAFM) is a multi-functional organisation which provides a wide range of services directly and through specialist state agencies operating under its aegis. Its mission is to lead the sustainable development of the agri-food and marine sector and to optimise its contribution to national economic development and the natural environment. The Department operates a number of testing centres and laboratories, in the areas of, veterinary diagnostics and research; meat control; seed testing; plant variety testing; cattle performance testing; pesticide control and dairy products control.

It should be noted that the figures below refer only to research expenditure by DAFM itself, as the agencies under DAFM's responsibility (Teagasc and the Marine Institute) complete their own separate returns. DAFM engages in a broad range of R&D activities and these are outlined below with corresponding figures for the 2014 expenditure outturn and the 2015 expenditure allocation.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes -In-House</b>	€'000	€'000
<b>R&amp;D-Related Veterinary Laboratory Activities</b>		
Operation of a central veterinary research laboratory at Backweston, Celbridge, Co. Kildare, regional veterinary research laboratories at Cork, Limerick, Sligo, Athlone and a testing laboratory in Waterford.	4,090	4,600
<b>Improvement of Crops</b>		
Improving the quality of crops and crop products through the use of the highest quality varieties and seeds. The main activities leading to achievement of this objective include the operation of two stations/farms at Fermoy in Co. Cork and Backweston in Co. Dublin, where plant varieties are evaluated, the operation of a potato laboratory at Raphoe in Co. Donegal and the carrying out of trials in farmers' fields throughout the country	947	1,010
<b>Research and Development Programmes - Performed Elsewhere</b>		
<b>Institutional Food Research - Competitive Funding Programme</b>		
In its implementation of the Food Institutional Research Measure (FIRM) of the RTDI component of the Productive Sector OP under the National Development Plan 2000 - 2006 and 2007 - 2013, the Department is involved in the management of competitive tendering by food research institutions for grant aid to support food research in priority areas. It monitors the progress of successful projects, payment of grant aid and evaluation of the programme.	8,796	7,816
<b>Agricultural Production Research - Competitive Funding Programme</b>		
This is the Research Stimulus Fund measure of the Productive Sector OP of the NDP 2000-2006 and NDP 2007-2013 which encourages co-operative research in agricultural production. This involves management of competitive tendering by research institutions for grant aid to support agricultural research projects in priority areas, monitoring of progress of successful projects, payments of grant aid and evaluation of the programme.	4,338	4,612

<p><b>CoFoRD- Competitive Funding Programme.</b></p> <p>The Programme of Competitive Forest Research for Development supports the economic, environmental and social goals of forest policy through funded research aimed at developing national forest research capacity and competence.</p>	2,441	2,200
<p><b>CVERA- Centre for Veterinary Epidemiology and Risk Analysis</b></p> <p>CVERA was initially established as the Tuberculosis Investigation Unit, but its remit has expanded to cover a wide range of international, national and local animal health matters, including BSE, and other diseases (e.g. emergency diseases such as avian influenza, bluetongue and equine diseases). CVERA also has developed links with Animal Health Ireland in relation to non-regulatory diseases such as IBR. CVERA's expertise includes agriculture and animal sciences, database development and management, geographic information systems (GIS), statistics, veterinary medicine and epidemiology.</p>	1317	1455
<p><b>Improvement of Livestock</b></p> <p>Improving the quality of livestock and livestock products through adoption of better breeding and selection practices carried out in Irish Cattle Breeding Federation (ICBF)/ Sheep Ireland. The main activities leading to achievement of these objectives are operation of on-farm and central testing stations; recording schemes; collaboration with and support for research in animal breeding at research institutions and at the Irish Equine Centre, Co. Kildare which undertakes R&amp;D activities relating to equines.</p>	897	968
<p><b>Genetic Resources in Plants and Animals</b></p> <p>The Department of Agriculture, Food and the Marine's grant aid scheme for the conservation of genetic resources for food and agriculture has been in place since 1996. The Scheme has an annual call for projects aimed at supporting the conservation and sustainable use of genetic resources for food and agriculture. Projects are evaluated by an advisory committee, representing broad national stakeholder interests.</p>	179	177
<p><b>International Equine Institute</b></p> <p>Based in University of Limerick the Institute receives a grant payment from DAFM to work on issues of relevance to the equine industry.</p>	0	250

## Department of Agriculture, Food and the Marine

### Bord Iascaigh Mhara

BIM is the Irish State agency with responsibility for developing the Irish Sea Fishing and Aquaculture industries. BIM was established under the Sea Fisheries Act 1952. BIM's mission is "to promote the sustainable development of the Irish seafood industry at sea and ashore and support its diversification in the coastal regions so as to enhance its contribution to employment, income and welfare both regionally and nationally".

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<p><b>Aquaculture Development Programme</b></p> <p>The approval of the Irish Seafood National Programme also enabled the roll out of BIM Schemes aimed at assisting trials on innovative technology in commercial aquaculture to improve competitiveness; to establish the economic and technical feasibility of new sites and species; to assist measures for the improvement of environmental sustainability, fish health and welfare and product quality; to promote occupational health and safety and skills and to harmonise aquaculture into coastal and rural communities.</p> <p>Twenty three project applications were assisted under BIM's Schemes.</p>	1,185	1,100
<p><b>Business Development &amp; Innovation Programme</b></p> <p>During 2013, BIM invested in category management projects that drive growth and competitiveness in the main commercial seafood categories.</p> <p>During 2013, the section undertook four significant projects aimed at:</p> <ul style="list-style-type: none"> <li>▪ Developing technology for boarfish products.</li> <li>▪ Utilising white fish by-products and improving product quality.</li> <li>▪ Developing domestic Irish seafood trade.</li> <li>▪ Investigating the market</li> </ul> <p>Seafood Development Centre</p> <p>During 2013, 29 seafood companies used the Seafood Development (SDC) services covering market opportunity identification, New Product Development (NPD) and product concept development, branding and labelling advice, sensory panels, pilot testing, equipment and product scaling-up.</p> <p>Technology reference projects were developed covering innovations/NPD from a range of Irish seafood companies. There was a particular focus on developing Technological Innovation as well as NPD innovation within the seafood sector. The investigations into technological innovations required the investment at the end of 2013, with a number of large seafood processors subsequently scheduling trials for 2014.</p> <p>During 2013, the SDC made significant investment in pilot facilities including a new breeding cooking line to generate a range of new products including boarfish, blue whiting and combinations with other fish species.</p>	1,229	1,102



<p><b>Fisheries Development Programme</b></p> <p>In addition to its suite grant aid schemes which assist the fleet in the areas of safety, quality, hygiene and certification, the Fisheries Development Programme included inter alia the following elements in 2013.</p> <ul style="list-style-type: none"> <li>▪ Cod Recovery and Discard Reduction: Trials were carried out in the Irish Sea to investigate the interaction between square mesh panels and the Swedish grid.</li> <li>▪ Fisheries Interactions with Protected Species: Monitoring and management of bycatch of protected species including cetaceans, seals, elasmobranchs and birds was undertaken in 2013.</li> <li>▪ Tuna: The results of the satellite tagging programme were published.</li> <li>▪ Waste Management: A total of fifty tonnes of old monofilament nylon fishing nets were recycled.</li> <li>▪ Fisheries in Natura 2000 sites: Fisheries Development Division coastal staff gathered information on inshore fisheries to facilitate a risk assessment of marine natura 2000 sites.</li> <li>▪ International Certification of Irish Seafood: BIM, working closely with industry, facilitated 82 vessels and three onshore facilities achieve certification to the Responsibly Sourced Standard (ISO 65, EN45011) during the year.</li> <li>▪ Traceability of Seafood (E-LOCATE): Administered by BIM on behalf of the Sea Fisheries Protection Agency (SFPA). 15 projects implementing state of the art traceability and labelling networks were approved. These projects will facilitate the global identification of Irish seafood and will allow for the quantification of responsibly caught and certified seafood products.</li> <li>▪ Economics: Data Collection Framework: BIM continued, under the to collect economic data from the fishing fleet, aquaculture and processing sectors. The Annual Economic Report was prepared for the Scientific, Technical and Economic Committee for Fisheries (STECF).</li> <li>▪ Sentinel Vessel Programme: In 2013, the BIM Sentinel Vessel Programme continued to gather performance data from inshore fishing vessels (less than 10 metres in length) from 88 vessels, from selected fisheries within the inshore fleet.</li> <li>▪ North Western Waters Regional Advisory Council (NWWRAC): The Secretariat of the NWWRAC is hosted by BIM in Dun Laoghaire. In 2013, the NWWRAC programme of working group and executive committee meetings in Paris (2), Bilbao and Dublin (2) was concluded with a general assembly meeting of the NWWRAC in Dublin Castle on the 18th of September 2013.</li> </ul>	3,020	2,358
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# Department of Agriculture, Food and the Marine

## Marine Institute

The Marine Institute has the general functions “to undertake, to co-ordinate, to promote and to assist in marine research and development and to provide such services related to marine research and development that in the opinion of the Institute will promote economic development, create employment and protect the marine environment” (Marine Institute Act, 1991). The key services delivered by the Marine Institute include:

- **Research**

The Marine Institute's activities, in relation to marine research, fall into three main areas:

1. **Research Performer:** The Marine Institute undertakes research (both applied and experimental development) through its operational programmes and also through leading and participating in many national and international research projects.
2. **Research Funder:** The Marine Institute manages the *National Marine Research Programme*, which provides funding to the Irish marine sector through competitive calls. Funding is provided for marine research that addresses national strategic priorities as stated in the *Sea Change Strategy 2007-2013, Harnessing Our Ocean Wealth - An Integrated Marine Plan for Ireland* and the Report of the Research Prioritisation Steering Group.
3. **Research Promoter, Coordinator and Catalyst:** The Marine Institute co-ordinates and promotes marine research, bringing together industry, higher education institutions and government bodies to support the development of Ireland's knowledge economy and the marine sector.

- **Monitoring, Data Collection and other Technical Services**

The Institute carries out statutory and non-statutory monitoring and data collection to underpin the development of the marine sector and the sustainability of the marine environment and resource aimed at:

- Food safety monitoring (e.g. biotoxins, residues, microbiology);
- Managing fisheries resources (including migratory stocks);
- Understanding and monitoring the marine environment and climate change (e.g. hazardous substances, nutrients, phytoplankton);
- Supporting environmental directives (e.g. EU Marine Strategy Framework and Water Framework Directives and Natura Legislation); and
- Monitoring & auditing impact of marine economic activity.

- **Provision and Formulation of Scientific, Technical and Strategic Policy Advice**

The Marine Institute provides advice to a range of national and international agencies and departments which supports both national and EU policy decisions across all marine sectors. This includes the formulation of EU Marine Science Policy & Programme Development.

- **Sectoral Development**

The Marine Institute provides a number of services related to the development of Ireland's vast marine resource. Specifically, the Irish Maritime Development Office (IMDO) is dedicated to the development and promotion of the shipping and maritime transport sector.

In addition, the Institute liaises closely with national development agencies in order to maximise the economic potential of existing marine sectors (e.g. marine food) and emerging marine sectors (e.g. marine biotechnology, green technologies and renewable ocean energy).

The Marine Institute has developed world-class marine research infrastructure including: HQ & Laboratory Complex (54 labs) in Oranmore, Co. Galway; an Aquaculture & Catchment Management Research Facility in Newport, Co Mayo; two multi-purpose National Research Vessels, a remotely operated vehicle (ROV); Ocean Energy Test & demonstration sites in Galway and Mayo; and a range of specialist scientific equipment and data management facilities.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<p><b>Marine Institute R&amp;D Programmes</b></p> <p>The Marine Institute is a significant research performer - competing for and securing funds from both national and international (EU FP/H2020 and INTERREG) funding sources. This research supports the provision of government services, including the provision of policy advice; underpins the competitiveness and market accessibility to Irish seafood production (fisheries and aquaculture) through a range of scientific research assessment and monitoring programmes spanning fisheries resources, marine environment monitoring and marine food safety. In addition to the Institute's direct participation in externally funded research projects, the Institute also participates in marine research via in-kind contribution e.g. through the provision of research facilities/infrastructure for projects that are complementary to the Institute's core activities.</p> <p>The Marine Institute's research programme activity is classified in accordance with our five service areas, as follows:</p> <ul style="list-style-type: none"> <li>▪ Fisheries Ecosystem Advisory Services</li> <li>▪ Marine Environment and Food Safety Services</li> <li>▪ Ocean Science and Information Services</li> <li>▪ Irish Maritime Development Office</li> <li>▪ Office of the CEO /Corporate Services</li> <li>▪ Policy, Innovation and Research Support Services (from 2015)</li> </ul>	5,001	5,255
<p><b>Marine Research Sub-Programme</b></p> <p>The Marine Institute administers on a competitive basis the national marine research funding programme. Research funding is awarded on a competitive basis for 'applied' marine-related R&amp;D in line with the objectives set out in national strategies. The Institute administers and manages the following categories of funding:</p> <p>Project-Based Awards: Strategic Research Projects, Applied Research Projects, Demonstration Projects and Desk/Feasibility Studies;</p> <ul style="list-style-type: none"> <li>▪ Researcher Awards: Strategic Research Appointments, Research Capacity/Competency Building, Post-Doctoral Fellowships and PhD Scholarships;</li> <li>▪ Industry-Led Research Awards: Company Awards and Collaborative Awards; and</li> <li>▪ Infrastructure Awards: Infrastructure Acquisition and Access to Infrastructure, e.g. Shiptime on-board the National Research Vessels.</li> </ul>	5,586	4,788

# Department of Agriculture, Food and the Marine

## Teagasc

Teagasc, the Agriculture and Food Development Authority, is the leading organisation in the fields of agriculture and food research in Ireland undertaking research in four main areas:

1. Animal and Grassland,
2. Crops,
3. Environment and Land Use,
4. Rural Economy and Development Food.

Teagasc partners with many other research providers, particularly Irish Universities in conducting research and works closely with many industry organizations, such as the Irish Cattle Breeding Federation, Bord Bia, Animal Health Ireland and Enterprise Ireland in delivering on shared priorities.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Animal &amp; Grassland Research and Innovation Programme</b>		
<p>The aim of the Teagasc Animal and Grassland research and Innovation Programme is to increase the profitability, competitiveness and sustainability of Irish livestock production through research and innovation. The programme incorporates all animal (dairy cows, cattle, sheep and pigs) and grassland science and livestock systems research into a single programme thus positioning Teagasc as one of the leading international authorities on pasture-based systems of animal production.</p> <p>The objective of the animal component of the programme is to generate and procure new knowledge to support innovation in the key areas of Irish livestock production including breeding, nutrition, growth, reproduction, health, product quality, labour efficiency and facilities that will underpin the future profitability, competitiveness and sustainability.</p> <p>The objective of the grassland component of the programme is to generate and procure evidence-based knowledge to support innovation in the key areas of Irish grass production including grass breeding, growth, fertilisation, utilisation, nutritional value, and develop grazing systems that will underpin the profitability, competitiveness and sustainability of the sector and enhance food security.</p>	63,882	68,995
<b>Crops, Environment and Land Use Programme</b>		
<p>The aim of the Teagasc Crops, Environment and Land Use programme is to develop and transfer cost-effective crop production systems, along with evidence-based knowledge to support and underpin the development of an environmentally sustainable, competitive and profitable agri-food sector. This will be achieved by focusing on:</p> <ul style="list-style-type: none"> <li>▪ <b>Crop science:</b> to develop cost effective crop production systems, including crops for energy and bio-processing, which improve competitiveness, profitability and product quality, and minimise impact on the environment.</li> <li>▪ <b>Forestry development:</b> develop forests and forest management systems that maximize the potential of farm forestry from economic, social and environmental perspectives.</li> <li>▪ <b>Horticulture research:</b> to provide evidence based knowledge to support the competitiveness of the commercial horticulture sector.</li> </ul>		

- **Environmental research:** to provide evidence based knowledge to support and underpin the development of an environmentally sustainable, competitive and profitable agri-food sector through research projects and initiatives in nutrient efficiency, greenhouse gas and climate change, water quality, agricultural catchments, soils, biodiversity and environmental products and services.

### Rural Economy and Development Programme

The aim of the Teagasc Rural Economy and Development Programme is to help decision making by stakeholders of Teagasc through research and knowledge transfer activities.

Advanced social science investigation tools are utilised to understand the linkages between the various forces affecting the agri-food and rural economy to improve the quality of life in rural Ireland. The specific objectives of this programme are to:

- Collect timely, quality information in an efficient manner to support decision making by our stakeholders.
- Undertake research to interpret trends and changes in markets and policy to enable each of our stakeholders to make better decisions.
- Provide advice, training and tools to support our stakeholders in making decisions that enable their business to be more effective.
- Understand who adopts technology, why potentially beneficial technologies are not adopted and how adoption can be increased.

This is achieved through the implementation of research projects and initiatives in the areas of agriculture, trade & environmental policy analysis, farm and food economics, spatial analysis, surveys, innovation & rural development and environmental economics.

### Food Programme

The Teagasc Food Programme undertakes scientific research leading to the establishment of technological platforms that can be exploited by the Irish Food Processing Industry by adding value and ensures the safety and quality of food products. Furthermore, it is a highly applied research programme which has earned an international reputation based on its quality and scientific output.

The programme achieves its objective through the delivery of research and innovation projects in the areas of food safety, cheese, fermented & other dairy products, food ingredients, meat products, prepared consumer foods, food & health, market studies and technical services & training.

Long term the Teagasc Food Programme aims to:

- Improve and develop the safety and clean green image of Irish food products
- Expand and increase dairy product research to serve the expected increase in national milk yield
- Provide technology and knowledge to the meat processing industry to serve the economic increase in the meat sector.
- Support innovation, growth and export capability in the SME sector.

## Department of Arts, Heritage & the Gaeltacht

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<p><b>Research Excavation Grants Scheme - The Royal Irish Academy</b></p> <p>The Royal Irish Academy has a long association with the funding of archaeological excavation and field research in Ireland.</p> <p>The fund has financed over ninety excavations in Ireland since 1970, thus enabling scholars to make a substantial contribution to our knowledge of the past. It is the only fund in Ireland for independent research excavation</p>	86	80
<p><b>INSTAR Programme - The Heritage Council</b></p> <p>Established in 2008, the Irish National Strategic Archaeological Research (INSTAR) programme is funded by the Department of Arts, Heritage and the Gaeltacht and administered by the Heritage Council as an element of its grants programme.</p> <p>The main objective of the programme is to bring about an improvement in the quality of research undertaken by the consultancy sector in co-operation with the higher education sector and the state sector.</p> <p>INSTAR intends to address key archaeological issues, build research capacity, and address the issue of unpublished archaeological excavations.</p>	40	30
<p><b>The Discovery Programme - The Heritage Council</b></p> <p>The Discovery Programme is dedicated primarily to advanced research into Irish archaeology and related matters. It has two subsidiary functions:</p> <ul style="list-style-type: none"> <li>▪ Spread the new knowledge it derives from its research projects both to interested scholars and to the public at large.</li> <li>▪ Introduce and spread the use of new technologies and techniques to the practice of Irish archaeology.</li> </ul> <p>It does its work mainly by establishing research projects, led by experts, on specific questions or areas where more knowledge is required, relating to the Irish past.</p> <p>The Discovery Programme is also required to communicate the results of its projects to the scientific community and to the general public. This task is achieved mainly through the publication of its scientific books and papers, as well as through a variety of outreach publications and lectures, and by organising community events mainly in the areas where it is working.</p>	750	750

## Department of Arts, Heritage & the Gaeltacht

### Údarás na Gaeltachta

Údarás na Gaeltachta was established under the Údarás na Gaeltachta Act, 1979 and came into operation on 1st January 1980 to replace Gaeltarra Éireann which was dissolved by the same act.

The objectives of an t-Údarás are as follows:

- to encourage the preservation and extension of the Irish language in the Gaeltacht;
- to attract suitable native and foreign manufacturing projects to the Gaeltacht;
- to establish, develop and manage productive employment enterprises in the Gaeltacht;
- to participate in industries as an equity partner and to provide services to assist new industries in becoming established.

Údarás encourages investment in the Gaeltacht through a range of incentives for new enterprises and through support and assistance for existing businesses.

The organisation supports businesses in developing new markets, technologies, products and strategic alliances through research and development.

Gaeltacht companies span a range of commercial sectors, including tourism, fish processing and aquaculture, renewable energy, food, life sciences, ICT, niche manufacturing, audio visual and digital media, arts and crafts.

	2014 Outturn	2015 Budget
<b>Research and Development</b>	€'000	€'000
Research is funded by enterprises along with grants of up to 60% subject to a maximum of €126,973 for any one project.		
Eligible costs include R&D salaries, directly related additional overheads, the cost of capital assets to the extent and for the period of their use in the research project, costs of contractual research, technical knowledge and patents bought or licensed from outside sources, other operating expenses including costs of materials, supplies, travel and subsistence and other similar costs directly related to the research activity.	2,500	1,650

## Dept. of Communications, Energy & Natural Resources

The Mission Statement of the department is “to promote the sustainable development, management and regulation of the communications, energy, marine and natural resources sectors in support of national economic and social policy objectives”.

	2014 Outturn	2015 Budget
<p><b>INFOMAR (Integrated Mapping for the Sustainable Development of Ireland’s Marine resource)</b></p> <p>The objectives of the INFOMAR Programme is on continuing the seabed surveying to completion by mapping of Ireland’s valuable but complex shallow inshore waters, the development of a state of the art data-store and the development of outputs based on the data acquired</p>	€’000  90	€’000  100
<p><b>Griffith Geoscience Research Awards</b></p> <p>The objective of the awards, which are managed by the Geological Survey of Ireland (GSI), is to develop overall research capacity particularly in priority areas of geosciences research. The awards support the establishment of an all-island geosciences graduate school and seek to stimulate interest by primary and secondary school students in Geology/Geoscience through the production and distribution of geosciences outreach products.</p>	1,117	866
<p><b>General Geoscience Research</b></p> <p>The Geoscience Initiatives are a series of co-ordinated actions managed by GSI and aimed at local authorities to support infrastructural development planning and environmental protection.</p>	100	100
<p><b>ObSERVE Programme</b></p> <p>In October, 2014, the Department of Communications, Energy and Natural Resources, in liaison with the Department of Arts, Heritage and the Gaeltacht (National Parks and Wildlife Service), established a significant data acquisition programme designed to acquire new baseline data, with the aim of filling existing data gaps with regard to protected marine species and sites in key offshore basins.</p>	0	1,245
<p><b>Unconventional Gas Exploration and Extraction (UGEE)</b></p> <p>The Unconventional Gas Exploration and Extraction (UGEE) Joint Research Programme is funded by the Environmental Protection Agency (EPA), the Department of Communications Energy and Natural Resources (DCENR) and the Northern Ireland Environment Agency (NIEA).</p> <p>The UGEE Joint Research Programme is a comprehensive programme of research and there are many elements to it including baseline analysis and desk -based literature reviews. The five main elements comprise:</p> <ol style="list-style-type: none"> <li>1. Impacts on surface waters, groundwater and related ecosystems;</li> <li>2. Impacts on seismic activity;</li> <li>3. Impacts on air quality;</li> <li>4. International operational practice and impact mitigation measures; and</li> <li>5. Regulatory regimes for fracking in different countries</li> </ol>	0	207



## Dept. of Communications, Energy & Natural Resources

### Inland Fisheries Ireland

Inland Fisheries Ireland (IFI) was formed on 1st July, 2010 following the amalgamation of the Central Fisheries Board and the seven former Regional Fisheries Boards into a single agency.

Inland Fisheries Ireland is responsible for the conservation, protection, management, development and promotion of the inland fisheries resource (including sea angling) across the country. Ireland has over 70,000 kilometres of rivers and streams and 144,000 hectares of lakes all of which fall under the jurisdiction of IFI.

IFI also has a role in the provision of advice to the Minister and stakeholders in relation to the Inland Fisheries Resource. It is the role of IFI's R&D function to provide data and analysis on the status of rivers, fish species and habitats to support IFI management in development of policies and in offering advice relating to the inland fisheries natural resource.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>		
<b>Programme Monitoring</b>		
Ongoing activity includes assessing the biological potential of freshwater lakes and rivers for fishery development; many of these databases are used to design riverine rehabilitation programmes.		
Surveys of estuaries and inshore marine areas to locate habitats of popular marine sport fish and surveys of stocks of such fish; evaluating the progress of current development programmes in terms of fish numbers, etc. checking on conditions of fishing waters i.e. measuring trophic/nutrient status and pollution hazards which might threaten the State's investments in fisheries; water sampling and analysis for pollution control and prosecutions.	€'000	€'000
Current work being carried out by the Research and Development Division includes:		
<ul style="list-style-type: none"> <li>▪ The Mulkear LIFE project, a European Commission funded LIFE Nature project working on the restoration of the Lower Shannon Special Area of Conservation for Atlantic Salmon, Sea Lamprey and European Otter.</li> <li>▪ Eel Monitoring Programme, to monitor eel population recovery in Ireland following the imposition of a new national eel stock management regime.</li> <li>▪ OPW Environmental River Enhancement Program (EREP), designed to examine environmental impacts of OPW channel maintenance programme on fisheries habitat, fish populations and other river corridor biota and to develop more environmentally sensitive maintenance strategies.</li> <li>▪ Celtic Sea Trout Project - Ireland/Wales Interreg programme to understand and describe sea trout stocks in the Irish Sea and thereby to enhance sea trout fisheries and strengthen their contributions to quality of life, to rural economies and to national biodiversity.</li> </ul>	3,151	2,444

## Dept. of Communications, Energy & Natural Resources

### Sustainable Energy Authority of Ireland (SEAI)

Sustainable Energy Authority of Ireland established under the Sustainable Energy Act 2002, has a mission to play a leading role in transforming Ireland into a society based on sustainable energy structures, technologies and practices.

This encompasses environmentally and economically sustainable production, supply and use of energy, in support of Government policy across all sectors of the economy. Its remit relates mainly to improving energy efficiency, advancing the development and competitive deployment of low carbon sources of energy and combined heat and power, and reducing the environmental impact of energy production and use, particularly in respect of greenhouse gas emissions. SEAI is financed by Ireland's EU Structural Funds Programme and co-funded by the Irish Government and the European Union and manages programmes aimed at:

- supporting Government decision-making through advocacy, analysis and evidence
- driving demand reduction and providing advice to all users of energy
- driving the decarbonisation of energy supply
- raising standards in sustainable energy products and services
- building markets based on quality, confidence and proven performance
- fostering innovation and entrepreneurship
- improving the coherence of Irish energy research and development

	2014 Outturn	2015 Budget
<b>Research and Development</b>	€'000	€'000
Sustainable Energy Ireland's research, development and demonstration (RD&D) programme is designed to assist the development of a least-cost path to CO2 reduction and sustainable energy in Ireland. It has programmes active in the areas of built environment, industry, renewables, and transport.		
SEAI's Sustainable Transport Programme demonstrates the technical and economic feasibility of sustainable technologies in Ireland by supporting a number of RD&D studies into the integration of renewable energy technologies into transport systems.	5,641	6,500
The Ocean Energy Programme was established to advance the deployment of ocean energy technologies in Ireland by increasing the capacity for research and development both with academic institutions and commercial entities developing devices in Ireland.		
SEAI's Renewable Energy RD&D Programme was established to support the acceleration of uptake of renewable energy solutions and new renewable technologies.		
SEAI's Microgeneration programme assesses the technical, financial and regulatory issues surrounding the deployment of small and micro generation technologies in Ireland.		

## Dept. of Communications, Energy & Natural Resources

### National Digital Research Centre Ltd. (NDRC)

NDRC is an early stage investor in tech companies. By providing the people, time, space and investment needed at the earliest stages of company creation work, they build new ventures worthy of commercial investment and with the ability to scale.

The NDRC team has the breadth of knowledge and expertise in technology and markets. They work side-by-side with researchers, entrepreneurs and venture teams to turn great ideas into successful new ventures. The NDRC supports, advises and helps companies execute new ventures.

The NDRC is an unusual investor in that they go in early and are flexible in response to learnings gained from their +170 pre-seed investments.

By the end of 2014, NDRC's portfolio of startup ventures had secured a cumulative €88m in follow-on investment from commercial investors, with a combined market capitalisation of approx. €220m.

NDRC invests primarily using an accelerator model through its NDRC LaunchPad and NDRC VentureLab investment programmes, providing modest amounts of capital and high amounts of hands on support to early stage companies.

	2014 Outturn	2015 Budget
<b>Research and Development</b>	€'000	€'000
LaunchPad		
- For startup companies with a business model innovation	3,500	2,750
VentureLab Programme		
- For startup companies with a piece of technology and associated intellectual property		

## Department of Education and Skills

Funding is available to all Universities and Institutes of Technology to support the development of their research capabilities, to support outstandingly talented individual researchers, and to encourage co-operation within institutions and between institutions. The funding primarily aimed at developing research capacity in the higher education system through the development of high quality 4th level education. Funding is provided for PhD students and early-stage postdoctoral researchers under the Irish Research Council. Funding for these programmes is made available through the Higher Education Authority (HEA). Dedicated funding is also provided through HEAnet to ensure that high quality internet services are available to students and researchers in higher education institutions. These are essential supporting services for the research system as a whole and benefit all research funding agencies.

The education related elements of the regional operational programmes, which is funded through the Department of Jobs, Enterprise and Innovation, also supports Research and Development activities in the higher education sector through the Strategy for Science, Innovation and Technology:

Expenditure and programmes run by the Higher Education Authority and the Dublin Institute for Advanced Studies are listed elsewhere in this Report.

	2014 Outturn	2015 Budget
<b>Education Research Centre (ERC)</b>	€'000	€'000
There are three main international studies managed by the ERC and funded directly by the Department of Education and Skills. They are:		
<ul style="list-style-type: none"> <li>▪ Programme for International Student Assessment (PISA) - an OECD international study of 15 year olds' performance in reading, mathematics and science.</li> <li>▪ Trend in International Mathematics and Science Study (TIMSS) In 2015, Ireland is taking part in TIMSS (Trends in International Mathematics and Science Study) - a study involving 46 countries at primary level and 41 countries at post-primary.</li> <li>▪ Progress in International Reading Literacy Study (PIRLS) - PIRLS is the world's largest study of reading achievement at primary level, and takes place every five years.</li> </ul>	1,466	1,904
<b>The European University Institute (EUI)</b>		
The EUI Florence is a postgraduate institute established by the Member States of the European Union whose functions include advanced teaching, research and providing a forum for the exchange of ideas and experience. The main teaching activity is the PhD programme, leading to the doctorate of the Institute, on topics related to its research programme in the fields of history, economics, law and political and social sciences.		
The Institute's Centre for Advanced Studies is the research arm of the Institute and offers Jean Monnet Fellowships for post-doctoral research.	280	350

## Department of Education and Skills

### Dublin Institute for Advanced Studies

The Dublin Institute for Advanced Studies is a statutory corporation established in 1940 under the Institute for Advanced Studies Act, 1940. The Institute has three constituent schools - the School of Celtic Studies, the School of Theoretical Physics and the School of Cosmic Physics. Each school has an independent governing board. The Institute, through the constituent schools, pursues fundamental research and trains students in advanced methods of original research.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<p><b>The School of Theoretical Physics</b></p> <p>The School pursues research in the general areas of theoretical physics and mathematics.</p> <p>Particular areas of expertise are: theoretical particle physics, quantum field theory, quantum gravity, quantum mechanics, quantum information theory, quantum and classical statistical mechanics, disordered systems, geometry and topology, non-commutative geometry and infinite-dimensional algebras, lie groups and algebras, C*-algebras, functional analysis, and probability.</p>	511	515
<p><b>The School of Cosmic Physics</b></p> <p>The School of Cosmic Physics has two research sections, one in Geophysics and one in Astronomy/Astrophysics:</p> <p>The Geophysics section studies the physical and geological structure of the Earth as well as its evolution in time. The three principle research activities are electromagnetism, global modelling and seismology. Sample projects are:</p> <p>The IRE THERM project, which has been active since 2011, aims at contributing to the understanding of geothermal targets in Ireland on different scales.</p> <p>IRECCSEM. Evaluating Ireland's potential for onshore carbon sequestration and storage using electromagnetics</p> <p>Structure and Seismicity of Ireland's Crust. In short, advanced geophysical methods and newly available seismic data are being used to determine the structure and current seismicity of Ireland's crust at a new level of detail, contributing significantly to the natural resource assessment and exploration.</p> <p>The Irish Centre for Research in Applied Geosciences brings together Ireland's leading geoscience experts on issues underpinning economic development.</p> <p>European Plate Observing System, - EPOS is an initiative in response to the EU policy for a coordinated approach to support and develop research infrastructures.</p> <p>In the Astronomy and Astrophysics Section the main areas of research are high-energy astrophysics, astroparticle physics, star formation, space instrumentation and computational astrophysics.</p> <p>DIAS is involved in both the testing and software development for the Mid Infrared Instrument, one of the main instruments on board the James Webb Space Telescope.</p>	1,353	1,486

## Department of Education and Skills

### SOLAS

The dissolution of FÁS has led to the establishment of SOLAS together with the establishment of the 16 Education and Training Boards incorporating 33 former VECs.

The Further Education and Training Act was signed into law in July 2013. It provided for the dissolution of FÁS, the establishment of SOLAS and the phased transfer of the existing FÁS training centre network, its associated provision and staff to the relevant ETBs.

ETBs are now the primary provider of state-funded further education and training (FET).

SOLAS is responsible for funding, coordinating and monitoring FET provision provided by ETBs.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
The Skills and Labour Market Research Unit assists in the development of SOLAS through providing research inputs at corporate level.	465	455
Its main areas of work include; labour market and skills research evaluation/customer surveys. It also maintains a National Skills Database and provides regular reports for the Expert Group on Future Skills Needs		

## Department of Education and Skills

### Higher Education Authority

The Higher Education Authority (HEA) which is under the aegis of the Minister for Education and Skills is a corporate body with perpetual succession, established in May 1972 under the provisions of the Higher Education Authority Act, 1971. HEA has the following functions:

1. furthering the development of higher education;
2. assisting in the co-ordination of State investment in higher education and preparing proposals for such investment;
3. promoting the attainment of equality of opportunity in higher education;
4. promoting the democratisation of the structure of higher education.

The HEA is financed by a grant-in-aid from the Department of Education and Skills out of a total vote for third level and further education. Besides the exchequer grant (via the HEA), Universities, Institutes of Technology (IOTs) and other institutions receive non-exchequer monies, i.e. non-exchequer fees, research grants and other income.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Universities - Recurrent (Core) Funding</b>		
<p>This refers to the annual funding provided by the State via the HEA for the purposes of funding the recurrent activities of higher education institutions (HEIs). This core grant is allocated to cover core teaching and research activities within institutions - the internal allocation of funds as between teaching and research are at present a matter for each institution.</p> <p>The allocation of the core grant is determined on a formula basis. The allocation will be based on a standard per capita amount in respect of weighted EU student numbers in four broad subject price groups. Student numbers in the four groups are weighted to reflect the relative cost of the subject groups (see Appendix 1). A further weighting is given for research students and 5% is also top-sliced from the aggregate grant for all higher education institutions, exclusive of the grant in lieu of tuition fees. This top-sliced amount is allocated as follows -</p> <ul style="list-style-type: none"> <li>▪ 75% in proportion to the proportion of Ph.D. and Masters research degrees awarded</li> <li>▪ 25% in proportion to the proportion of research income per academic staff member, earned by each institution. This top-slice does not oblige HEIs to spend this amount on research - the internal allocation of the core grant is still a matter for each institution.</li> </ul>	140,160	133,781
<b>Institutes of Technology - Recurrent (Core) Funding</b>		
<p>This refers to the annual funding provided by the State via the HEA for the purposes of funding the recurrent activities of Institutes of Technology (IoTs). This core grant is allocated to cover core teaching and research activities within institutions - the internal allocation of funds as between teaching and research are at present a matter for each institution. A new funding model has been developed for the IoTs and follows the principles of the RGAM (see Appendix 1).</p> <p>The research top slice is not made for the IoTs. There are plans to introduce a top slice for the 2015 allocation.</p>	8,325	8,212

<p><b>E-Journals - IReL the Irish Research eLibrary*</b></p> <p>IReL the Irish Research eLibrary is a nationally funded electronic research library, initially conceived to support researchers in Biotechnology and Information Technology in mid-summer 2004, and following on from the success of this, expanded in 2006 to support research in the Humanities and Social Sciences.</p> <p>IReL delivers quality peer-reviewed online research publications journals, databases and index &amp; abstracting services, as well as ebooks - direct to the desktop of researchers wherever they are located. The benefits of IReL are available to all students and staff in the universities, RCSI and the Institutes of Technology, which is particularly important in instilling a research culture at undergraduate level.</p>	8,021	9,421
<p><b>The Irish Centre for High-End Computing (ICHEC)*</b></p> <p>The Irish Centre for High-End Computing (ICHEC), founded in 2005, is Ireland's national high performance computer centre. Its mission is to provide High-Performance Computing (HPC) resources, support, education and training for researchers in third-level institutions and through technology transfer and enablement to support Irish industries large and small to contribute to the development of the Irish economy.</p> <p><i>* Co-funded by the Department of Jobs, Enterprise and Innovation</i></p>	1,400	1,400
<p><b>HEAnet</b></p> <p>HEAnet is Ireland's National Education and Research Network, providing high quality Internet Services to over 150,000 students and staff in Irish Universities, IoT's and other educational and research organisations. Established in 1983 by the seven universities with the support of the HEA to promote the interchange of information electronically within third level education, it now plays a critical role in establishing Ireland as a global centre of excellence in internet activity. HEAnet provides a high-speed national network with direct connectivity for its community to other networks in Ireland, Europe, the USA and the rest of the world.</p>	8,765 (re-current €7.9m  capital €0.8m)	8,505 (re-current €7.7m)  Capital €0.8m)
<p><b>Irish Aid Programme for Strategic Co-operation</b></p> <p>Irish Aid is the official development assistance programme of the Irish Government targeting the reduction of poverty, inequality and exclusion in developing countries. The Programme of Strategic Cooperation (PSC) is administered by the Higher Education Authority (HEA) on behalf of Irish Aid. The PSC seeks to enhance the potential of higher education and research institutions to contribute to the achievement of the Millennium Development Goals (MDGs).</p>	750	1,411
<p><b>The Programme for Research in Third Level Institutions (PRTLl)</b></p> <p>PRTLl supports building strategic institutional research capacity, enabling the establishment of research centres and facilities, and joint research programmes and national initiatives. The programme is also taking the lead in the establishment of Structured PhD Programmes as the standard mechanism for education of PhDs, producing PhDs with the skill sets to work both in the public and private sectors. The HEA manages this component of PRTLl in partnership with the Irish Research Councils.</p> <p>PRTLl is concerned with building a sustainable, long-term and broadly-based research capability in third level institutions and encourages the institutions to develop institutional research strategies to achieve this. The aim is to help to accelerate the development of critical mass in their existing strengths and to develop new areas consistent with their institutional strategies and plans for research. PRTLl also seeks to develop stronger inter-institutional collaboration and to promote close linkage between research and the quality of teaching and learning at all levels in the institution.</p> <p><i>This programme is administered by the HEA on behalf of the DJEI.</i></p>	37,411	26,314



## Department of Education and Skills

### Irish Research Council

The Irish Research Council was established in March 2012. The Council was formed through the merger of the Irish Research Council for the Humanities and Social Sciences (IRCHSS) and the Irish Research Council for Science, Engineering and Technology (IRCSET).

The Council recognizes the importance of research and scholarship for all aspects of cultural, economic and societal development and aims to demonstrate how creativity, excellence, curiosity, relevance and impact can go hand in hand for Ireland's benefit by funding the best and the brightest researchers in Ireland.

The mandate of the Council is:

- To fund excellent research within, and between, all disciplines, and in doing so to enhance Ireland's international reputation as a center for research and learning.
- To support the education and skills development of excellent individual early state researchers and cultivate independent researchers and thinkers, whilst offering a range of opportunities which support diverse career paths
- To enrich the pool of knowledge and expertise available for addressing Ireland's current and future challenges, whether societal, cultural or economic, and deliver for citizens through collaborations and knowledge exchange with government departments and agencies, enterprise and civil society.
- To provide policy advice on postgraduate education and on more general research matters to the HEA and other national and international bodies.

Council's research schemes include:

- Government of Ireland Postgraduate Scholarships
- Government of Ireland Postdoctoral Fellowships
- Government of Ireland Research Project Grants

Also funded are a number of programmes developed in partnership with employers:

- Enterprise Partnership Scheme
- Employment based Postgraduate Programme
- ELEVATE postdoctoral programme

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
Total programme allocations for :		
• Arts, Humanities & Social Sciences (AHSS) and	31,400	31,400
• Science, Technology, Engineering and Maths (STEM)		

## Dept. Environment, Community & Local Government

The mission of the Department of Environment, Community & Local Government is to pursue sustainable development. In pursuing this mission their goals are to:

- contribute to national recovery through the timely delivery of our policies and programmes especially in support of job creation;
- contribute to public service reform;
- ensure good quality housing in sustainable communities;
- protect and improve water resources and the quality of drinking water;
- achieve a high quality environment with effective environmental protection;
- support and enable democratic and responsive local government;
- promote and support the development of communities and the community and voluntary sector;
- ensure that planning and building in our regions and communities contributes to sustainable and balanced development; and
- monitor, analyse and predict Ireland's weather and climate

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Local Government Management Agency</b>		
There are two elements of Research & Development in LGMA - one in relation to Libraries while the other is related to developing ICT systems underpinning the work of the LGMA and local authorities		
CTO - ICT Systems	280	460
The Research and Architecture team take on a number of annual Projects. Projects are prioritised to maximise the benefit of the Local Government Sector. On an annual basis research is carried out in both pure technology fields and in business areas of Local Government.		
Libraries	0	42
AthenaPlus; PERFORMA; Europeana Food & Drink and Space; ELINET		

## Dept. Environment, Community & Local Government

### Environmental Protection Agency

The Environmental Protection Agency (EPA) is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992. Its sponsor in Government is the Department of the Environment, Community and Local Government. The EPA is a statutory body responsible for protecting the environment in Ireland and ensuring that development is sustainable. They regulate and police activities that might otherwise cause pollution and ensure there is solid information on environmental trends so that necessary actions can be taken.

The EPA supports R&D activities in a range of environmental areas. This work is carried out by researchers in third level institutions, state agencies, government departments, local and regional authorities, the private sector and by individuals.

#### Environmental Research 2014-2020

The EPA recently published its research strategy for the period 2014-2020, a process which involved substantial stakeholder engagement (over 600 stakeholders attended seven workshops). The research programme is based around “three pillars” (climate, water and sustainability), representing the key research priorities associated with delivering a protected Irish environment.

##### 1. Climate

The Climate Change Research Programme is directed at addressing specific knowledge gaps of direct relevance to the National Climate Change Strategy prepared by the Department of Environment Heritage and Local Government.

##### 2. Water

The EPA Water Research programme has a strong focus on policy and has been driven by national regulations and European Directives. Policy-related research plays a vital role in ensuring that EU and national policies are implemented in the most cost-effective manner.

##### 3. Sustainability

This pillar is designed to identify pressures, inform policy and develop solutions to environmental challenges within the following four thematic areas

- (i) Resource Efficiency,
- (ii) Health and Well-Being,
- (iii) Natural Capital and Ecosystem Services and
- (iv) Socio-Economic Aspects

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Research Programmes</b>	8,221	7,000

## Dept. Environment, Community & Local Government

### Met Éireann

Met Éireann, the Irish Meteorological Service, established in 1936, is a division of the Department of the Environment, Community & Local Government. The service is engaged in the following activities:

- Collection, analysis and publication of meteorological, geophysical and geochemical data;
- Supply of weather forecasts, statistical information and scientific advice to agricultural, industrial and public utility undertakings, radio, television and the web, maritime interests and members of the public;
- Supply of similar information to Government departments, semi-State bodies, and the defence forces;
- Provision of meteorological facilities in Ireland in support of civil aviation and the supply of advice on meteorological aspects of civil aviation matters generally;
- Development work in applied meteorology;
- Climate Change research;
- Co-operation with the meteorological services of other countries and the representation of Ireland at meetings concerned with international co-operation in meteorology.

Met Éireann is funded directly by the Department of the Environment, Community & Local Government but a significant portion of the expenditure is recovered by the department in the form of route charges payable by the airlines for meteorological services to civil aviation and by means of fees for information and advice supplied to commercial and other interests on a repayment basis.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<p>Research is carried out in various fields of meteorology and climatology. The primary thrust of the research effort is towards the development of computer models for weather analysis and prediction and participation in an international research collaboration called HIRLAM (High Resolution Limited Area Modelling), together with Norway, Sweden, Finland, Denmark, Spain, the Netherlands and Iceland. The HIRLAM forecasting model is now in routine use and upgraded regularly.</p> <p>Following on from the work of C4I (concluded end of 2007), Met Éireann continued to contribute to the work in the area of Climate Change by contributing to the STRIVE and EC-Earth Projects on an ongoing basis from 2009.</p> <p>Work is continuing in the areas of homogenisation methods of climate series and climate data analysis.</p> <p>In 2013 work began on atmospheric dispersion modelling to provide an emergency capability for forecasting the transport of noxious materials released into the atmosphere. This research work provides support for the EPA, RPII and the Department of the Agriculture, Food and the Marine.</p> <p>Development work is also ongoing in the area of NWP post-processing and also in the area of Forecaster Workstation and Automatic Weather Observations.</p>	255	327

## Dept. Environment, Community & Local Government

### Office of Radiological Protection (EPA)

In 2014, the Radiological Protection Institute of Ireland (RPII) merged with the Environmental Protection Agency (EPA).

Functions previously undertaken by the RPII up to the start of August 2014 are now carried out by the newly established Office of Radiological Protection within the EPA. More information on the Office of Radiological Protection is available at: <http://www.epa.ie/about/org/orp/>

Its main functions are:

- to advise the Government and to provide information to the public on matters relating to radiological safety;
- to regulate the use, transportation and disposal of radioactive materials;
- to prepare safety codes and regulations for the safe use of ionising radiation;
- to measure levels of radioactivity in the environment and assess their significance;
- to assist in the development of a national plan from an emergency arising from a nuclear accident;
- to provide a dosimeter service and to promote knowledge, proficiency and research in nuclear science and technology.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Monitoring of Environmental Radiation</b>		
This programme monitors contamination of the aquatic and terrestrial environment by radioactivity from man-made sources. It also carries out other related research.	35	46
<b>Radon Studies and Information Advice Service</b>		
The monitoring of indoor radon levels in homes, schools and workplaces and related research to determine the extent of elevated radon levels in buildings is the main element of the programme. Information and advice to Government and other agencies on all matters relating to ionising radiation are provided by the Information Service.	41	44
<b>Nuclear Safety</b>	42	35

## Department of Finance

### Economic and Social Research Institute (ESRI)

The Economic Research Institute was established in 1960 by a group of senior academics and public servants, led by Dr T.K. Whitaker. He identified the need for independent research to support economic policymaking in Ireland, and persuaded the Ford Foundation to provide seed funding for its establishment. The statistician, Dr R.C. Geary was appointed as its first Director.

The Institute's importance in providing authoritative research to inform public policy is widely recognised. This public good role is supported by an annual grant-in-aid from the Department of Public Expenditure and Reform; the grant has accounted for an average of 30 percent of the Institute's income over the lifetime of the last Research Strategy.

Most of the rest of the funds needed to sustain the research of the ESRI comes from research programmes in partnership with government agencies and departments, commissioned research projects mostly by public bodies and competitive research programmes (e.g. EU Framework programmes, IRC, HRB, SFI). Membership subscriptions also contribute to the Institute's income.

The ESRI is a company limited by guarantee, answerable to its Members and governed by a Council made up of interested individuals drawn from the academic, public and private sectors. The Institute's constitution stresses its independence, and the practice is to publish all research that reaches an appropriate academic standard.

The ESRI is audited by the Comptroller & Auditor General and is subject to the rules that apply to state organisations in relation to prompt payments, disclosure, risk management and tax clearance

	2014 Outturn	2015 Budget
<b>RESEARCH &amp; DEVELOPMENT</b>	€'000	€'000
During 2014 the Institute undertook research projects in macroeconomics; internationalisation and competitiveness; energy and environment; communications and transport; labour markets and skills; migration, integration and demography; education; taxation, welfare and pensions; social inclusion and equality; health and quality of life; children and young people and behavioural economics.	6,500	6,858
<b>TECHNICAL &amp; INFORMATION SERVICES</b>		
In 2014 work continued on the National Longitudinal Study of Children in Ireland on behalf of the Office of the Minister for Children. The ESRI also continued to provide management services to the Healthcare Pricing Office regarding the operation of the HIPE and NPRS systems.	3,520	1,678

## Department of Health

The Department of Health was established under the Ministers and Secretaries Act (Amendment), 1946. The mission of the Department of Health is "in partnership with the providers of health care, and in co-operation with other Government departments, statutory and non-statutory bodies, to protect, promote and restore the health and well-being of people by ensuring that health and personal social services are planned, managed and delivered to achieve measurable health and social gain and provide the optimum return on resources invested".

The role of the Department of Health is to support the Minister and the democratic process by:

- Formulating policy underpinned by an evidence-based approach and providing direction on national health priorities ensuring that quality and value for money are enhanced through the implementation of an evidence-based approach underpinned by monitoring and evaluation.
- Protecting the interests of patients and consumers and supporting practitioners and professionals to practice to the highest standards by providing a prudent and appropriate regulatory framework.
- Providing effective stewardship over health resources by demanding accountability for achieving outcomes including financial, managerial and clinical accountability, and by providing the frameworks, including enhanced service planning at national level, to improve the overall governance of the health system.
- Fulfilling our obligations in relation to EU, WHO, Council of Europe and other international bodies and the continued implementation of the co-operation agenda decided by the North-South ministerial council.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>National Cancer Registry Board</b>		
The National Cancer Registry Board was established in June 1991, under the Health (Corporate Bodies) Act, 1961.		
Its functions are inter alia, to research and analyse information relating to the incidence and prevalence of cancer and related tumours in Ireland and to promote and facilitate the use of data collected in approved research projects and in the planning and management of services.	2,829	2,633

## Department of Health

### Health Research Board

The Health Research Board (HRB) is the lead agency in Ireland supporting and funding health research. It provides research funding and maintains health information systems and commissions research linked to national health priorities. The HRB's mission is to improve people's health, patient care and health service delivery by:

- leading and supporting excellent research by outstanding people within a coherent health research system
- generating knowledge and promoting its application in policy and practice;

and, in doing so, play a key role in health system innovation and economic development.

The HRB's Strategic Business Plan 2010-2015 clearly outlines how we hope to achieve our mission, working in partnership with other organisations. The HRB's strategic goals are:

1. Driving the development of excellent clinical research, including applied biomedical research, within a coherent health research system.
2. Building capacity to conduct high-quality population health sciences research and health services research.
3. Working with key partners to develop and manage high-quality national health information systems.
4. Generating and synthesising evidence, and promoting the application of knowledge to support decision-making by policy makers and relevant practitioners.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>Clinical &amp; Applied Biomedical Research</b> - This unit has responsibility for developing the infrastructure, career support and programmes for biomedical and clinical research	394	437
<b>Population Health and Health Services Research</b> - This unit has responsibility for building capacity to conduct world-class health services and population health research in Ireland. This involves providing support for healthcare professionals to engage in research across their career pathways.	722	800
<b>Health Research</b> - The HRB currently manages funding programmes and commitments worth approximately €100m. Funding covers all areas of health research from biomedical, translational, clinical and practice-based research, through to population health and health services research.	38,158	32,248
<b>National Health Information Systems Research</b> - This unit manages five national health information systems including the; The National Drug Treatment Reporting System, the National Drug-Related Death Index and the National Psychiatric In-Patient Reporting System	1,243	1,562
<b>The Evidence Generation &amp; Knowledge Brokering</b> - This unit is a team of researchers and information specialists who provide objective, and comparable evidence generation. They also facilitate a knowledge centre and on- line portal for the delivery of high-quality health information and research evidence.	1,175	1,155



## Department of Jobs, Enterprise and Innovation

### Office of Science, Technology and Innovation (OSTI)

The science, technology and innovation and enterprise agendas pursued by the Department of Jobs, Enterprise and Innovation and its Agencies are focused on creating and supporting long-term sustainable jobs.

The Office of Science, Technology and Innovation (OSTI) is responsible for

- Advising the Minister on general STI activities and directing and coordinating the R&D programmes of the agencies.
- Development, promotion and co-ordination of Ireland's Science, Technology and Innovation policy, in particular, through the ongoing implementation of Research Prioritisation, which is resulting in more targeted investment in Science, Technology and Investment, which will further enhance the effectiveness and impact of our research investment to deliver high quality, sustainable employment.
- Providing research funding to Science Foundation Ireland (SFI) and consequential policy issues arising from Ireland's investments through SFI.
- Providing funding to Enterprise Ireland to
  - provide RDI supports for Irish companies;
  - deliver programmes to increase the level of collaborative R&D activity between industry and third level sector researchers and
  - deliver programmes to accelerate the commercialisation of State funded research.
- Funding a number of smaller R&D programmes, such as the integrated awareness programme, Discover Science & Engineering, which is delivered by Science Foundation Ireland, with the aim of increasing the numbers of students taking science as a career and promoting science literacy generally.
- Developing and co-ordinating Ireland's input in regard to EU research policies and programmes. The OSTI is responsible for the funding of, and is represented on, the policy formulation committees of the following five Inter-Governmental S&T Organisations:
  - European Space Agency (ESA)
  - European Molecular Biology Conference (EMBC)
  - Co-operation in Science and Technology Programmes (COST)
  - EUREKA
  - European Molecular Biology Laboratory (EMBL)
- Providing funding to the Higher Education Authority for the Programme for Research in Third Level Institutions (PRTLTI), which supports the provision of top-class research infrastructure (buildings, laboratories and cutting edge equipment) as well as human capital development, through Structured PhD/Emergent Technology programmes across Ireland's HEIs.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>European Space Agency (ESA)</b> A principal objective of Ireland's membership of the ESA is to promote opportunity for high technology industry in Ireland. The greater part of Ireland's contribution is returned as industrial contracts involving collaboration between enterprises in the Member States.	17,279	17,279
<b>European Molecular Biology Conference (EMBC)</b> Since 2000, Irish researchers have been successful in obtaining 10 long-term fellowship awards, as well as 11 short-term fellowships and one young investigator's award; further promoting Ireland's standing within the European scientific community.	210	191
<b>EUREKA</b> Eureka is a European research initiative designed to ensure that the technological gap with other countries is narrowed. It promotes joint research between firms in different countries.	26	33
<b>European Molecular Biology Laboratory (EMBL)</b> EMBL is an Inter-Governmental Research Organisation whose mission is the development of molecular biology throughout Europe. Membership of EMBL complements Ireland's significant investment in the biotechnology area by presenting opportunities for research training, networking and enhanced international collaboration.	1,090	1,112
<b>Tyndall National Institute</b> Tyndall National Institute, UCC is one of Europe's leading centres for Information, Communications and Technology research and development. It is the largest facility of its kind in Ireland. Tyndall, formally known as the National Microelectronics Research Centre, was established in 2004 to provide a critical mass of researchers that would support the growth and development of a smart knowledge based economy in Ireland.	2,900	2,900

## Department of Jobs, Enterprise and Innovation

### Enterprise Ireland

The application of research and innovation to business is critical to the success of the Irish economy. Enterprise Ireland provide supports for both companies and researchers in Higher Education Institutes to develop new technologies and processes that will lead to job creation and increased exports.

	2014 Outturn	2015 Budget
	€'000	€'000
<b>Research and Development Programmes</b>		
<b>R&amp;D Fund</b>		
<p>El provides assistance for significant investment in R&amp;D initiatives which arise as part of a company's strategic development. The R&amp;D Fund is designed to provide support for research, development and technological innovation relevant at all stages of company development, and will enable companies to progress from undertaking an initial research project to high level innovation and R&amp;D activity.</p>	50,057	50,760
<b>Technology Centres</b>		
<p>El supports the establishment and maintenance of centres where the research agenda is directed by groups of companies who work together with higher level researchers to perform medium term commercially relevant research.</p>	20,000	18,300
<b>Commercialisation Fund</b>		
<p>This programme supports academic researchers to take the outputs of research with commercial potential and bring it to a point where it can be transferred into industry.</p>	22,254	22,035
<b>Innovation Partnerships</b>		
<p>These are aimed at harnessing the strengths of the third level sector to work in partnership with companies on specific R&amp;D projects.</p>	8,504	8,500
<b>Industry Led Networks</b>		
<p>These are aimed at providing support for research in areas defined by networks of companies in specific industry sectors. The work is overseen by an industry board and El works to create real collaboration between companies and the researchers to ensure the transfer of technology.</p>	73	70

## Department of Jobs, Enterprise and Innovation

### IDA Ireland

IDA Ireland has national responsibility for securing new investment from overseas in manufacturing and international services and for encouraging existing foreign enterprises to expand their businesses. With a staff of 250 people and headquarters in Dublin, IDA Ireland has 18 overseas offices.

Activities include the international and national promotion of Ireland as a location for overseas investment and the provision of financial incentives for the attraction of new overseas investment into Ireland, as well as the expansion of its existing client base of almost 1,000 companies. As part of its brief to develop overseas companies already in Ireland, IDA Ireland focuses on encouraging these companies to locate additional or higher order functions in Ireland, e.g. a research and development unit.

IDA Ireland is committed to supporting its clients to establish and grow R&D activities in Ireland. The objective is to ensure that its client companies are focused on activities for which Ireland is a cost-effective location and thus help to secure their competitiveness and strategic importance within the overall company.

There are no administrative costs associated with science and technology activities as no separate staff are assigned to administer research and development grants.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
The IDA Research, Development & Innovation (RD&I) Support programme is designed to support companies at all stages of RD&I and enable them to move from start-up R&D, through developing capacity and adding competence, to a fully integrated RD&I function.	45,303	62,000
Support levels are tied to an assessment of strategic objectives, in conjunction with commercial and technical assessments.		

## Department of Jobs, Enterprise and Innovation

### InterTradeIreland

InterTradeIreland is the only organisation which supports SMEs across the island to develop North/South trade and business development opportunities for the mutual benefit of both economies.

“We encourage better use of our collective resources to accelerate trade and business growth across the island and create an environment where it is easier to do business. We achieve this through co-operative business, policy and research programmes, partnerships and networks.”

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<b>INNOVA</b>		
INNOVA supports cross-border R&D collaboration between companies, with the support of public research organisations where required.	238	119
INNOVA assists companies to create new products, processes or services or significantly improve existing ones.		

## Department of Jobs, Enterprise and Innovation

### Science Foundation Ireland

Science Foundation Ireland (SFI), the national foundation for excellence in scientific research, funds oriented basic and applied research in the areas of science, technology, engineering, and mathematics (STEM) which promote and assist the development and competitiveness of industry, enterprise and employment in Ireland. The Foundation also promotes and supports the study of, education in and engagement with STEM, and an awareness and understanding of the value of STEM to society and to the growth of the economy in particular.

SFI's strategic plan, Agenda 2020, contains four primary objectives:

- To be the best science funding agency in the world at creating impact from excellent research demonstrating clear value for money
- To be the exemplar in building partnerships that fund excellent science and drive it out into the market and society
- To have the most engaged and scientifically informed public
- To represent the ideal modern public service organisation staffed in a lean and flexible manner, with efficient and effective management

SFI helps to link researchers in partnership across academia and industry through a number of mechanisms such as the SFI Research Centres, SFI Partnership programme and the SFI Industrial Fellowship programme, to address crucial research questions, to foster the development of new and existing Ireland-based technology companies to create innovative products leading to job creation, to attract industry that could make an important contribution to Ireland and its economy, and to expand educational and career opportunities in Ireland in science and engineering.

SFI recognises the importance of supporting early- and mid-career researchers as highlighted in Agenda 2020. The goal of career development programmes is to prepare/develop researchers for future careers in academia or in the industry sector. One of our key objectives is to increase the level of early-career researcher support and to that end, SFI provides a number of schemes for early- and mid-career investigators.

SFI operates a number of programmes not all of which are active every year. SFI continuously reviews the funding mechanisms in place to ensure that the appropriate structures and opportunities are available for the research community to enable performance of excellent science with impact.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes - SFI operates a suite of programmes not all of which are active every year.</b>	€'000 153,544	€'000 157,000

**SFI Research Centres**

SFI Research Centres link scientists and engineers in partnerships across academia and industry to address crucial research questions, foster the development of new and existing Ireland-based technology companies, attract industry that could make an important contribution to Ireland and its economy, and expand educational and career opportunities in Ireland in science and engineering. They are structured on a hub & spoke model consisting of a number of targeted projects undertaken in partnership with industry that connect into a central hub containing the platform research and core operations. Research Centres Programme calls may be open or themed - generally rotating between the two formats in sequential calls.

**SFI Spokes Programme - Research Centres**

To promote the further development of SFI Research Centres to incorporate new areas of research, new industrial and academic collaborators. The Spokes Programme includes both a rolling component and a fixed deadline component. Proposals will be accepted at any time (rolling call) if 50% or more of the costs are paid for in cash by the industry partners.

**SFI Partnership Programme**

SFI will engage with partners to co-support outstanding initiatives which will build research strength in Ireland. The programme will fund projects or people (for a limited time) to aid development and retention of talented researchers, foster industrial collaborations and develop capacity in areas of emerging importance.

**SFI / EI Technology Innovation Development Award (TIDA)**

The TIDA Feasibility Study programme is designed to enable researchers to focus on the first steps of an applied research project which may have a commercial benefit if further developed. Researchers who have the scientific and technical capability to produce novel technologies and who are keen to develop a better understanding of the commercialisation process are especially encouraged to apply for this award. Convergent applications from researchers within different disciplines are also encouraged.

**SFI Investigators Programme (IvP)**

SFI's Investigator Programme supports the development of world class research capability and human capital in areas of science, engineering and mathematics that demonstrably support and underpin enterprise competitiveness and societal development in Ireland. To this end, SFI funds outstanding people with innovative ideas and strategic partnerships, recognising that excellence remains a paramount criterion in the research it funds. Investigator Programme calls may be open or themed - generally rotating between these two formats on an annual basis.

**SFI Research Professorship Programme**

The recruitment of world leading scientists and engineers will build the national research and enterprise base, and enhance Ireland's reputation as a centre of excellence for research. The SFI Research Professorship Programme is intended to support national strategic priorities by assisting research bodies in their recruitment of world-leading researchers for Professorial Chairs, or similar research leadership positions in targeted scientific areas. The programme may also act as a mechanism to support the recruitment of individuals that possess a strong industry background, as well as directorship roles in established research centres within Ireland.

### **SFI Industry Fellowship Programme**

To promote the exchange of people at all levels between academia and industry (both SME and MNC). Fellowship funding is provided across the entire academic salary scale for awards up to 1 year full time or 2 years part time (renewable competitively).

### **SFI Starting Investigator Research Grant (SIRG) Programme**

The SFI Starting Investigator Research Grant (SIRG) Programme provides an opportunity for excellent early-career investigators to carry out independent research and gain important experience on which to build their future research careers.

### **SFI Career Development Award (CDA)**

SFI's Career Development Award Programme supports excellent early- and mid-career investigators who are already in an independent academic position and who obtain their salary either from the organisation with which they are employed or from an alternative funding source. The award provides an opportunity to extend research activities by allowing teams to be built or expanded.

### **SFI President of Ireland Young Researcher Award**

The President of Ireland Young Researcher Award (PIYRA) is Science Foundation Ireland's most prestigious award to recruit and retain outstanding young researchers. This programme emphasises the importance that Science Foundation Ireland places on the early development of research careers. The award recognises outstanding engineers and scientists who, early in their careers, have already demonstrated or shown exceptional potential for leadership at the frontiers of knowledge.

### **SFI-Royal Society University Research Fellowship**

This scheme is for outstanding scientists in the Republic of Ireland who are in the early stages of their research career and have the potential to become leaders in their field. The scheme provides the opportunity to build an independent research career. The scheme covers all areas of the life and physical sciences, including engineering, but excluding clinical medicine and any researcher addressing a direct biomedical question.

### **SFI ERC Support Programme**

The SFI ERC support programme supports the Irish host institutions of awardees of the ERC Starting and Advanced Grant schemes. This programme will assist Irish host institutions in providing the appropriate support to ERC awardees. Awards may also be made when an ERC awardee moves to an Irish institution during the course of their ERC award. This programme will increase the benefits for institutions and applicants of applying to the ERC award schemes, increase Irish participation in the ERC programmes, increase institutional support of ERC awardees and increase Ireland's success rate in the ERC award schemes.



**SFI ERC Development Programme**

This programme supports researchers who have submitted a proposal to the ERC, been deemed fundable, but not funded due to a lack of programme budget. The objectives of the ERC Development Programme are to encourage unsuccessful ERC applicants, either Irish based or willing to relocate to an Irish Institution for their resubmission, to resubmit to the ERC in a future call, to encourage new submissions to the ERC from Irish-based investigators, and to increase success in obtaining funding through ERC award schemes.

**SFI Conferences and Workshops**

SFI's Conferences and Workshops Programme provides support for the organisation of national and international meetings that enable Irish research bodies to contribute to international scientific debate, encourage industry- informed research, and foster academic-industrial collaborations to build a competitive advantage for Ireland. There are different award types within the Conference and Workshop Programme, namely Conferences, Exceptional Conferences, Workshops, and Conference Bids.

**SFI Discover Programme**

The SFI Discover Programme will support national and regional projects in STEM education and outreach in Ireland with the aim of engaging and scientifically informing the general public. The Programme will fund both large scale national and regional projects as well as smaller local events concerning public engagement, education and outreach and STEM careers awareness.

**US-Ireland R&D Partnership Programme**

The Governments of the United States of America, Ireland and the Northern Ireland Executive have come together for a unique initiative to advance scientific progress in fields that will have a significant impact on the health, well-being and economic prosperity of all their citizens. The "US-Ireland R&D Partnership" links scientists and engineers in partnerships across academia and industry to address crucial research questions; fosters new and existing industrial research activity that could make an important contribution to the respective economies; and expands educational and research career opportunities in science & engineering.

**SFI-HRB-Wellcome Trust Biomedical Research Partnership**

The Wellcome Trust, in partnership with SFI and the HRB, will fund biomedical and clinical research in the Republic of Ireland under the auspices of the SFI- HRB- Wellcome Trust Biomedical Research Partnership. In line with their strategic research agendas, SFI and the HRB will co-fund with the Wellcome Trust successful biomedical and clinical science applications under the following Trust funding schemes: Investigator Awards, Fellowships, including Principal Research Fellowships (PRFs) and Strategic Awards.

Full details of all programmes can be found on the SFI website - [www.sfi.ie](http://www.sfi.ie)

## Department of the Taoiseach

### The National Economic and Social Council

The National Economic and Social Council (NESC) was established by government in November 1973. Its members include representatives from employer associations, trade unions, agricultural groups, community and voluntary organisations, environmental organisations, plus a number of independent members nominated by government.

The function of the Council is to analyse and report to the Taoiseach on strategic issues relating to the efficient development of the economy and the achievement of social justice and the development of a strategic framework for the conduct of relations and the negotiation of agreements between the government and the social partners. Council reports are submitted to the government, laid before each house of the Oireachtas and published.

The NESC is financed by a Grant from the Department of the Taoiseach and by income from the sales of publications. It employs a total of 18 staff. The NESC conducts studies on a wide range of relevant topics in the areas of economic, social and environmental policy.

Areas researched include: industrial policy, economic performance, social developments, the welfare state, migration, housing, the labour market, the environment, the European Union and the public policy system.

	2014 Outturn	2015 Budget
	€'000	€'000
<b>Research and Development Programmes</b>		
During 2014, NESC published five reports;	1,081	1,029
1. Ireland's Environmental Data: Inventory, Assessment and Next Steps,		
2. Jobless Households: An Exploration of the Issues,		
3. Social Housing at the Crossroads: Possibilities for Investment, Provision and Cost Rental,		
4. Wind Energy in Ireland: Building Community Engagement and Social Support,		
5. Homeownership and Rental: What Road is Ireland On?		
Work accounted for in 2015 Work Programme budget includes;		
▪ Housing Policy		
▪ Jobless Households		
▪ Renewal & Recovery		

## Department of Transport

### National Roads Authority

The aim of the NRA's Research Strategy is to promote practical measures that will contribute to cost reducing and/or quality enhancing innovation in regard to the Authority's functions. As the Authority has no in-house research capability, all of the research is commissioned from external providers in Ireland as well as other European countries. A proportion of the annual research funding is spent via transnational research programmes organised through CEDR (Conference of European Directors of Roads).

The research activities cover two broad functions:

- to undertake or arrange for research and development on road construction, maintenance, safety and transport matters of particular importance in Ireland, and
- to serve as a centre which can disseminate the findings of research in Ireland and other countries.

Research undertaken or commissioned by the National Roads Authority provides the Authority, the Department of Transport, Tourism and Sport, Local Authorities and their consultants and contractors with information, technical assistance and guidance related to all aspects of road construction, traffic, and transportation which enable them to formulate policy and plan, design, construct, maintain and operate the road system in the most cost effective and environmentally sustainable manner and to best practice standards.

The research activities fall under a number of broad policy themes and provide a framework within which the Authority's research activities are carried out and form the basis for the development of an Annual Research Programme.

	2014 Outturn	2015 Budget
Materials - Development of new construction materials; more efficient use of existing materials; conservation of scarce or natural materials; use of recycled materials, durability, repair and maintenance	€'000 64.7	€'000 109.7
Standards and specifications - Maintain up-to-date standards; develop new standards and specifications based on new developments; encourage innovation	16.9	87.2
Environment/sustainable construction - Consideration of environmental issues; effects of climate change; ways of reducing energy consumption; conservation of natural resources; alternative energy sources; "green" solutions etc.	64.7	162.6
Safety - Contribution of infrastructure to casualties and fatalities; improved safety of road users; improved skid resistance; interaction between road; vehicle and driver; understanding driver behaviour; improved structural safety; development of passive safety; risks associated with traffic induced noise & air pollution; incident management	79.2	88.4
Value for money - Improved global competitiveness; procurement methods; risk identification and allocation; more effective asset management procedures; making better use of existing infrastructure; improved traffic modelling and planning	137.7	115.9
Transportation and land use - Traffic growth predictions; land take-up at grade separated junctions; influencing driver behaviour; development of traffic models; intelligent transport systems; integrated transport systems; inter-modal studies	104.7	179.9
Heritage - Consider impact of roads on society; methods for archaeological investigations; other social issues.	14.8	2.4

## Offices

### Central Bank & Financial Services Authority of Ireland

The Central Bank Reform Act, 2010, created a new single unitary body - the Central Bank of Ireland - responsible for both central banking and financial regulation. The new structure replaces the previous related entities, the Central Bank and the Financial Services Authority of Ireland and the Financial Regulator.

The high level goals of the Central Bank of Ireland are to:

- Contribute to Eurosystem effectiveness and price stability
- Contribute to financial stability
- Ensure proper and effective regulation of financial institutions and markets
- Ensure that the best interests of consumers of financial services are protected
- Provide independent economic advice and high quality financial statistics
- Ensure efficient financial services infrastructure to the economy: payment and currency
- Maximise operational efficiency and cost effectiveness

The Bank continued to monitor, analyse and project short-term developments in the Irish and Euro-area economies during 2014-15. It also conducted research into longer-term structural issues.

The Bank co-operated with other Eurosystem national central banks and the ECB in these areas through its participation in ESCB committees and working groups. This work assisted the governor of the bank and other members of the ECB governing council in formulating policy during 2014-15.

The Bank also assessed macroeconomic conditions and considered policy issues in a domestic context, with a view to supporting policies aimed at maintaining low inflation and sustaining long-term growth in the Irish economy.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
Main areas of economic research include: economic intelligence and forecasting, inflation and competitiveness, monetary issues, econometric modelling, public finances, structural issues, housing market, productivity and growth.	790	711

## Office of Public Works (OPW)

The main focal points of OPW activity are Flood Risk Management and Estate Portfolio Management comprising Property Services and Heritage Services. In addition a number of services are provided by the Office as shared/agency services on a repayment basis to central Government Departments and Offices.

OPW employs specialist and professional staff in all aspects of architecture, engineering, valuation, quantity surveying and related disciplines. In-house resources are supplemented as required by the contracting of services from private sector companies.

Over 90% of construction, maintenance and conservation work is contracted from the private sector. Total staff employed at the end of 2014 was 1564. The Office managed expenditure of €381m on the OPW Vote in 2014 and in addition a significant level of works carried out on an agency and repayment basis.

In the course of their work, OPW's professional staff in the Estate Portfolio Management area carry out research and development of new building methodologies including the area of sustainability practice and specialist conservation and restoration techniques.

As part of the Flood Risk Management programme, professional staff invest time and resources in environmental hydraulic and hydrological research and development.

	2014 Outturn	2015 Budget
<b>Research and Development Programmes</b>	€'000	€'000
<ul style="list-style-type: none"> <li>▪ Development of a web-based applications portal for Flood Studies Update (FSU)</li> <li>▪ Database of extreme water levels and flood thresholds for 15 sites</li> <li>▪ Post storm recovery of beach-dune systems in Ireland</li> </ul>	51	44

## Appendix 6 - Sample Questionnaire

### Research & Development Funding and Performance in the State Sector 2014

This Survey provides details of the allocations and outturns by government on research and development activities. This data is required under Commission Regulation (EC) No 995/2012 implementing Decision No 1608/2003/EC of the European Parliament and of the Council concerning the development of statistics on science and technology.

[Commission Implementing Regulation \(EU\) No 995/2012 of 26th October 2012](#)

This is a request for details of the expenditure **OUTTURN in 2014** on research and development in your organisation

**Please return by: Tuesday 28th April 2015**

#### Research and Development

Research and experimental development (R&D) comprises of creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications. (Frascati Manual, OECD 2002)

[Frascati Manual - OECD 2002](#) [Standard Practice for Surveys on Research and Experimental Development]

In-House Research & Development Expenditure **OUTTURN** in 2014

Agency Name:

Section 1: Research and Development - **IN-HOUSE** (performed within your organisation) Expenditure (€'000) [if no R&D is performed In-House please go to Section 4]

In-House R&D programme name	Detailed current expenditure (€'000)		Detailed capital expenditure (€'000)		Total Expenditure (€'000)		Region		Type of in-house Research Activity (see detailed note below)			Irish Sources of Funding (as recorded under Total Expenditure in column E)						Foreign Sources of Funding (as recorded under Total Expenditure in column E)					
	Detailed current expenditure (€'000)	Detailed capital expenditure (€'000)	Total Expenditure (€'000)	Estimate by NUTS 2		Basic	Applied	Experimental Development	Irish Government (€'000)	Irish Enterprises (€'000)		Higher Education (€'000)	Private non-profit (€'000)		European Commission (€'000)		Foreign Enterprises (€'000)		International Organisations (€'000)		Other Sources (€'000)		
				S. & E.	B. & M. & W.					Current	Capital		Current	Capital	Current	Capital	Current	Capital	Current	Capital	Current	Capital	Current
1			0	%	%	%	%	%															
2			0	%	%	%	%	%															
3			0	%	%	%	%	%															
4			0	%	%	%	%	%															
5			0	%	%	%	%	%															
6			0	%	%	%	%	%															
Total	0	0	0						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Definition: Types of in-house Research Activity

Basic : Experimental or theoretical work undertaken primarily to acquire new knowledge, without any particular application or use in view.

Applied : Original investigation undertaken in order to acquire new knowledge, primarily directed towards a specific practical aim or objective.

Experimental Development : Systematic work, drawing on existing knowledge gained from research and practical experience, that is directed to producing new materials, products and devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

In-House Research & Development Personnel in 2014

Agency Name:

Section 2: In-House Personnel engaged in Research & Development Within your Organisation - by occupation (Headcount and % Research Time)

Please note that this section refers only to personnel involved in R&D performed within your organisation as recorded in Section 1.

R&D Programme Name (Please record the staff working by Programme as recorded in Section 1)	Researchers				Technicians				Other R&D Personnel				Total R&D Personnel	
	Male		Female		Male		Female		Male		Female		Male	Female
	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Headcount
1													0	0
2													0	0
3													0	0
4													0	0
5													0	0
6													0	0
<b>Total</b>	0		0		0		0		0		0		0	0

Section 3: In-House Personnel engaged in Research & Development Within your Organisation by qualification (Headcount & % Research Time)

R&D Programme Name (Please record the staff working by Programme as recorded in Section 1)	PhD holders				Other University Degrees/ 3rd level diplomas				Other Qualifications				Total R&D Personnel	
	Male		Female		Male		Female		Male		Female		Male	Female
	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Time Use (%)	Headcount	Headcount
1													0	0
2													0	0
3													0	0
4													0	0
5													0	0
6													0	0
<b>Total</b>	0		0		0		0		0		0		0	0

Definition: Time Use (%)

The following activities are deemed as "research activities" for the purpose of this survey

Include

- Personal research or team research
- Writing research proposals or research reports
- Supervision of PhD students
- Other research based activities including administration and planning

omit

- Teaching
- General administration
- Supervision of non-PhD students
- Other non-research based activities or external activities

The following activities are not deemed as "research activities" for the purpose of this



