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Business Activity

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National Statistics

The Northern Ireland Research and Development Statistics 2012 is a National Statistic.

1: Summary and Commentary

Introduction

This bulletin provides information on the level of Research & Development (R&D) activity in Northern Ireland. R&D activity contributes to the development of new technologies, products and processes and is a key driver of productivity growth. The Northern Ireland R&D surveys cover the business sector, higher education and other government financed activities.

It includes information on: the level of R&D; sources of funding for R&D and employment in R&D. Data is presented in cash terms, while real terms estimates have been adjusted for changes in the general price level between years using the GDP deflator. This allows changes in the volume of R&D expenditure to be examined over time.

It provides important indicators of the extent to which Northern Ireland companies and higher education establishments are investing in the activities that underlie future economic development.

Coverage and Results

All companies believed to be performing R&D were included in the survey - in effect, therefore, a census of known R&D performers was carried out. A total of 1,077 returns were received by the Department – some 83% of those identified.

Where companies failed to respond, their level of R&D spend was estimated from Invest NI administrative records, other business surveys and historical records as appropriate. Overall, estimates accounted for 4.8% of the value of total Business Expenditure on R&D (BERD) for 2012. For further information see Section 4 - Background Notes.

All results contained in this bulletin are provisional and may be subject to revision to take account of any additional information received subsequent to publication.

Historical Expenditure (Cash terms)

Figure 1: Expenditure on R&D in Cash Terms 2001-2012 (£million)

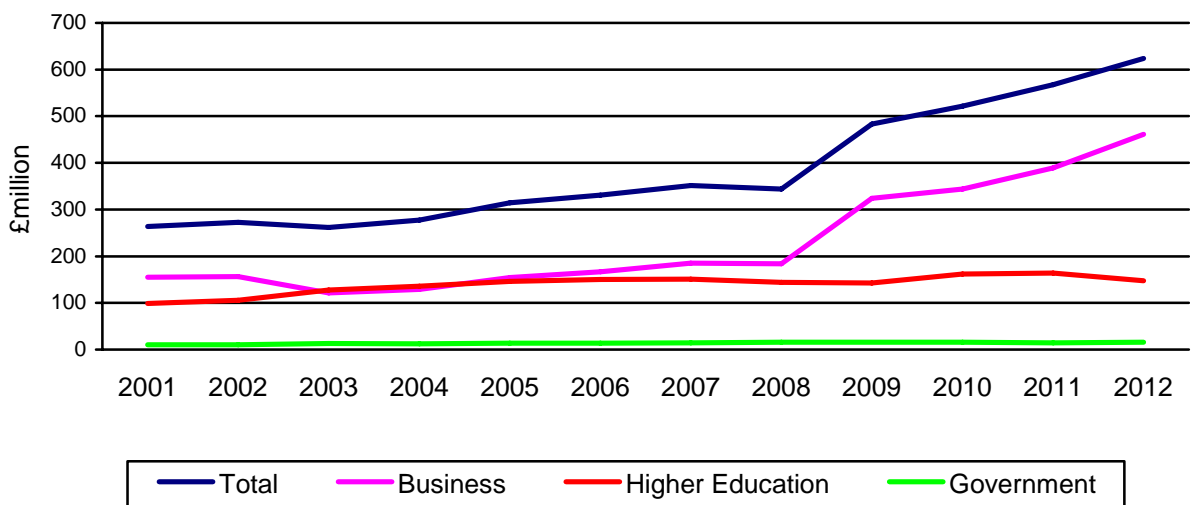


Table 1: Total Expenditure on R&D in Cash Terms 2001-2012 (£million)

	Business	Higher Education	Government	Total
2001	155.0	98.8	10.0	263.8
2002	156.6	105.8	10.1	272.5
2003	121.3	127.8	12.7	261.8
2004	129.0	136.1	12.3	277.4
2005	154.3	146.2	13.6	314.1
2006	167.0	150.1	13.7	330.8
2007	185.1	151.3	14.7	351.1
2008	183.9	144.2	15.9	344.0
2009	323.7	143.0	16.1	482.8
2010	344.0	161.8	15.6	521.4
2011	388.8	164.3	14.4	567.5
2012	461.3	147.3	15.5	624.1

Total Expenditure on R&D in Cash Terms

Total expenditure on R&D in Northern Ireland (NI) in cash terms was £624.1 million (m) in 2012, of which £461.3m (74%) was spent by businesses, £147.3m (24%) by the Higher Education sector and the remainder, £15.5m (2%) was Government expenditure.

There was an increase of £56.6m (10%) in cash terms in NI total R&D expenditure between 2011 and 2012 to £624.1m. This increase was comprised of rises in Business R&D expenditure of £72.5m (19%) and in Government expenditure of £1.1m (8%) and a decrease in Higher Education expenditure of £17m (-10%). Over the last five years total R&D spending in cash terms in NI has risen by 78% and by 137% since 2001.

Historical Expenditure (Real terms)

Figure 2: Expenditure on R&D in Real Terms 2001-2012 (£million)¹

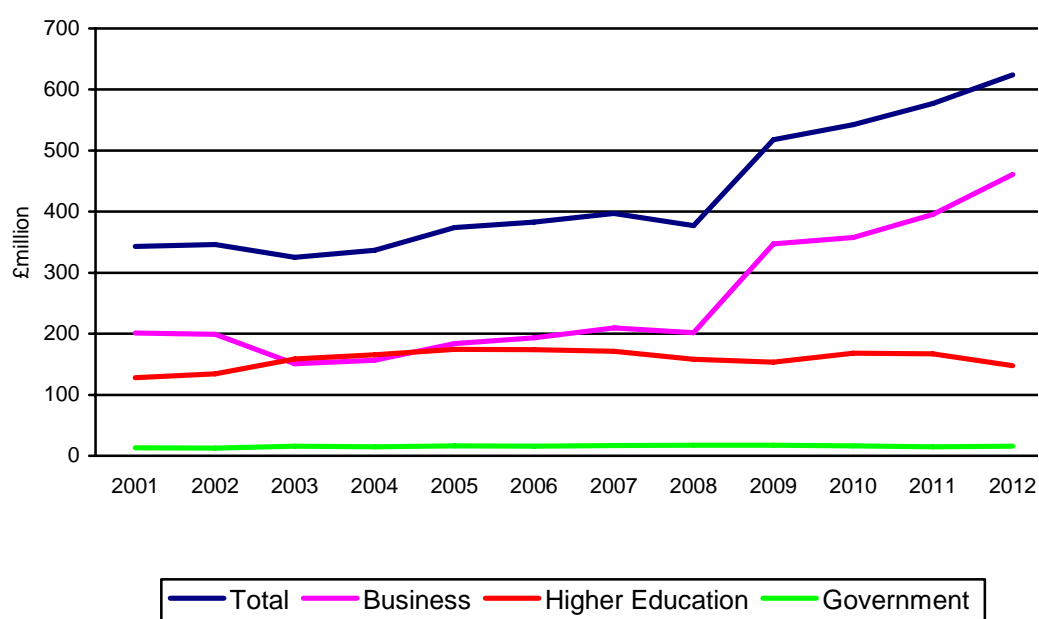


Table 2: Total Expenditure on R&D in Real Terms 2001-2012 (£million)

	Business	Higher Education	Government	Total
2001	201.3	128.3	13.0	342.7
2002	198.8	134.3	12.8	345.9
2003	150.7	158.8	15.8	325.3
2004	156.6	165.2	14.9	336.7
2005	183.7	174.1	16.2	374.0
2006	193.3	173.7	15.8	382.8
2007	209.4	171.2	16.6	397.2
2008	201.6	158.1	17.4	377.2
2009	347.2	153.4	17.3	517.8
2010	357.8	168.3	16.2	542.4
2011	395.3	167.1	14.6	577.0
2012	461.3	147.3	15.5	624.1

¹ GDP deflator used to convert cash terms to real terms: e.g. 2006 (86.4), 2007 (88.4), 2008 (91.2), 2009 (93.2), 2010 (96.1), 2011 (98.4), 2012=100

Total Expenditure on R&D in Real Terms

In real terms, total expenditure increased by £47.1m or 8% from £577.0m in 2011 to £624.1m in 2012.

In 2012 the NI business sector again accounted for a greater share of total R&D expenditure (74%) than the Higher Education sector (24%). In 2011 the figures were 69% and 29% respectively.

Over the last five years (2007-2012) total R&D spending in real terms in NI has risen by 57% and by 82% since 2001.

Over the year to 2012 there was an increase in expenditure by businesses and Government while a decrease occurred in Higher Education expenditure. In real terms, expenditure by businesses increased by £66.0m (16.7%), Higher Education decreased by £19.8m (-11.8%) and Government expenditure increased by £0.9m (5.9%) in real terms over the year.

Business R&D expenditure rose by 120% between 2007 and 2012 in real terms and by 129% between 2001 and 2012.

Detailed analysis of company spend in the rest of the survey is undertaken in cash terms, except where otherwise stated.

Business R&D: In-house Expenditure

NI business R&D expenditure carried out within a company in NI (in-house), accounted for 91% (£419.9m) of total business expenditure in 2012. In-house expenditure increased by 19% between 2011 and 2012.

Business R&D: Sectoral Analysis

As was the case in 2011, in 2012, the majority of R&D was carried out within the Manufacturing sector (78%) with the remainder (22%) carried out in the Services & Other sector. The share of expenditure in the Manufacturing sector compared to the previous year has decreased by 1.3%.

Over the year to 2012, an increase in expenditure occurred in both the Manufacturing sector and in the Services & Other sector. The increase in expenditure in the Manufacturing sector, (£78.9m or 28%) was bigger in value and proportional terms than the increase of £28.3m (38%) in the Services & Other sector.

The sectoral analyses are based on the Standard Industrial Classification 2007 (or SIC 2007) of industries for the 2009 publication and onwards. Care should therefore be taken when making comparisons with previous reports, which are on a SIC2003 basis.

Business R&D: by Company Size

Companies with 250 or more employees accounted for 63% of business R&D expenditure in 2012, although they represented only 9% of R&D performing companies. Small firms (i.e. those with less than 50 employees) represented some 69% of R&D performing companies and accounted for 14% of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)* accounted for 38% of the total business expenditure.

Total SME expenditure increased by £32.1m (23%) from 2011 to 2012, in cash terms. However, since 2007 SME expenditure has increased by 47% to £172.8m. The proportion that large companies (250+ employees) make to total R&D expenditure (63%) was slightly lower than 2011 (64%).

*The European Commission definition of Small Medium Enterprises (SME) used is defined as being enterprises with less than 250 employees and large companies as being enterprises with more than 250 employees.

Business R&D: Source of funds

The majority of funding came from companies' own funds (83%), with 10% from Government, 7% from overseas and other sources. The proportion of funding from overseas and other sources has increased from 2% in 2011 to 7% in 2012, whilst Government funding decreased from 15% in 2011.

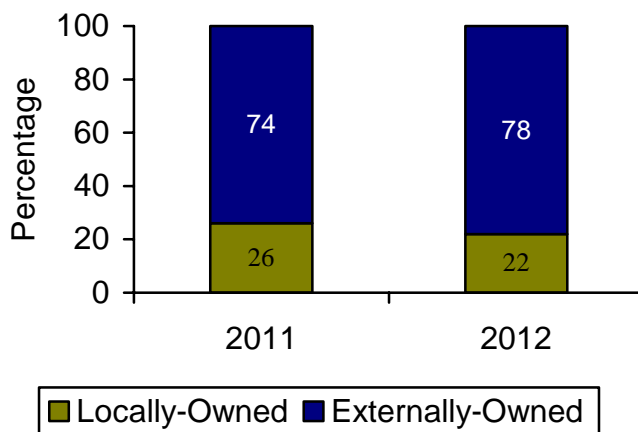
Business R&D: Ownership

Companies with ownership outside NI play an important role in financing R&D activities in the region. Over three quarters, £359.1m (78%) of total R&D spend was by such externally-owned companies although they accounted for 18% of all R&D performing companies. Their contribution to the total R&D spend was higher than in 2011 (74%) and their cash value increased by £71.4m over the same period.

R&D expenditure by locally-owned companies increased by 1% (£1.1m) between 2011 and 2012 while R&D Expenditure by externally-owned companies increased by 25% (£71.4m).

The majority of R&D expenditure in Manufacturing is carried out by externally-owned companies (83%), compared with the Services & Other sector (61%).

Figure 3: Expenditure by Ownership 2011-2012 (percentages)



Business R&D: Employment

Estimates of employment in R&D are produced on a full-time equivalent (FTE) basis whereby businesses convert part-time employees' hours into full-time employees' equivalents. FTE estimates provide a better indication of total labour input than a simple headcount.

In 2012, companies surveyed reported a total of 6,310 employees working on R&D, some 9% of all employees in companies carrying out R&D. The full time equivalent figure (FTE) for 2012 was 4,570.

The number of R&D employees increased by 16% over the year to 2012. The FTE rise from 2011 to 2012 was 8%.

Table 3: R&D Employment 2005-2012

	2005	2006	2007	2008	2009	2010	2011	2012
Number	2,720	3,040	3,310	3,750	4,690	5,230	5,440	6,310
FTE	2,600	2,870	2,760	2,940	3,520	3,950	4,240	4,570

Higher Education R&D

R&D expenditure in the Higher Education sector decreased by 10% in cash terms between 2011 and 2012 (from £165.6m to £148.9m). Net expenditure in 2012 (excluding spend by businesses undertaken by higher education) was £147.3m

Over half of funding (53%) for Higher Education R&D in 2012 came from the Government block grant (£78.9m). In 2012, there were some 1,500 full-time equivalent employees in the Higher Education sector engaged in R&D, decreasing from 1,550 employees in 2011.

In-house Business R&D: UK and Regional Comparisons

In-house expenditure is perhaps the most important component of total R&D as it shows the amount spent on R&D by firms in NI that was undertaken within NI (purchased R&D expenditure by companies in NI may be carried out in other parts of the UK or abroad). Spending carried out within a company in NI (in-house), accounted for 91% (£420m) of total business expenditure in 2012.

Of the 12 UK regions, nine showed an increase in in-house business R&D expenditure in cash terms over the year to 2012, including NI which increased by 19.3%. This was the second highest percentage increase across the UK regions. In the UK as a whole such expenditure decreased by 2.1%. Changes varied from an increase of 32.1% in London to a decrease of 19.6% in the North West.

Over the two year period 2010 to 2012, in-house business R&D expenditure in cash terms in NI increased by 30%. In the UK as a whole such expenditure rose by 7%.

It is worth noting that a number of NI companies are part of national and international companies. Many concentrate their R&D at particular sites, not necessarily in NI, although all of their plants, including those in NI, will share in the benefits of research. Variations may occur in NI R&D data from year to year due to the influence of one or two large-scale projects.

Table 4: In-house Expenditure by UK Government Office Region (Cash Terms)

	Expenditure (£million)		%Change (2011-2012)
	2012	2011	
UK	17,107	17,468	-2.1%
England	15,708	16,179	-2.9%
North East	282	259	8.9%
North West	1,784	2,220	-19.6%
Yorkshire & The Humber	603	551	9.4%
East Midlands	1,203	1,145	5.1%
West Midlands	1,461	1,282	14.0%
South West	1,364	1,359	0.4%
East of England	3,449	3,665	-5.9%
London	1,477	1,118	32.1%
South East	4,086	4,580	-10.8%
Wales	272	256	6.3%
Scotland	707	680	4.0%
Northern Ireland	420	352	19.3%

Note: Data for UK and GB regions are from the Office for National Statistics and Department of Finance and Personnel

R&D Investment Rate

Regional Gross Value Added (GVA) for 2012 released by the Office for National Statistics (ONS) on the 11th December 2013 shows that Northern Ireland 2012 in-house R&D as a proportion of GVA was 1.4% and was the fifth highest of the twelve UK regions (a lower proportion was recorded in North West (1.4%), South West (1.3%), North East (0.7%), Scotland (0.7%), Yorkshire & The Humber (0.6%), Wales (0.6%) and London (0.5%). Northern Ireland in-house R&D as a proportion of GVA is the higher than the UK average rate (1.2%). UK R&D results can be found at the following link:

<http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Research+and+Development+in+Business>

Other Sources

The most recent UK Innovation Survey (2011) provides estimates of the innovation activity of small, medium and large businesses (SMEs – those with 10 or more employees) in the production and most of the services sectors. Innovation covers a wide range of activities of which R&D is just one element. According to the latest results, during 2008-10 27% of NI SMEs were innovation active, compared to 30% during 2008-10. The equivalent UK figures also showed a decrease from 38% to 31%. The survey also reported that 12% of businesses reported carrying out internal R&D. However, the Innovation definition of R&D is broader than the Frascati manual definition, which must be borne in mind when making comparisons between the results of the R&D and Innovation surveys.

Northern Ireland results from the 2011 and earlier Innovation Surveys are available at:
<http://www.detini.gov.uk/deti-stats-index/stats-surveys/stats-innovation-survey.htm>

The methodology, sample details and first UK-level findings from the UK Innovation Survey 2011 can be found on the Office for National Statistics website at:
<http://www.bis.gov.uk/assets/biscore/science/docs/f/12-p107-first-findings-uk-innovation-survey-2011.pdf> (see pages 28-35).

2: Business Expenditure on Research and Development (BERD)

The performance and funding of most Research & Development (R&D) activity occurs in three main economic sectors: - the Business sector, Higher Education Institutions and Government.

The Northern Ireland Statistics and Research Agency (NISRA) carries out annual surveys of R&D expenditure in the Business sector and Higher Education Institutions in Northern Ireland (see Section 5 of this Statistics Bulletin for information on Higher Education R&D). Information on Government R&D comes from an annual survey conducted by the Office for National Statistics (ONS), which is addressed to all Government Departments, including those in NI².

Headline results from the surveys are provided in both cash and real terms while detailed analysis is provided mainly in cash terms.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SOME HISTORICAL COMPARISONS

Prior to 2001, the Research and Development Survey was conducted every three years (in 1993, 1996 and 1999). Since 2001, DETI (and now NISRA) have undertaken to survey companies annually. Table 5 below makes comparisons with earlier surveys. To allow comparability of current with previous results, all figures relate to Total Business Expenditure - i.e. total expenditure by business on R&D (including grants given by government). Higher Education spending and other direct expenditure by Government are excluded.

Key Findings

Between 2007 and 2012 total business expenditure on R&D increased by 120% in real terms, with in-house R&D increasing by 110% and purchased R&D expenditure increasing by 345%. The share of business expenditure from own funds as a proportion of all funding had no change over the year, Government funding decreased by 35% and other sources of funding increased by 229%.

The ten biggest R&D spenders in 2012 accounted for 63% of total expenditure which is slightly higher than the proportion in 2011 (62%). This is the largest proportion of total spend since 2001.

The proportion of total expenditure by the top ten companies for each R&D survey for the preceding five years is as follows – 62% in 2011, 59% in 2010, 57% in 2009, 41% in 2008, and 49% in 2007.

² The latest details are available on the Department for Business, Innovation & Skills website at <http://www.bis.gov.uk/policies/science/science-innovation-analysis/statistics>

In Cash Terms

In 2012, 51 companies spent more than £1 million on R&D, one more company than in 2011, seven more than in 2010, four more than in 2009, and ten more than the number in 2008. Average in-house R&D expenditure was £92,000 per R&D employee in 2012, 10% higher than the figure of £84,000 per R&D employee in 2011, (employees are on a Full-Time Equivalent basis).

In 2012, 4,570 employees (on a Full-time Equivalent (FTE) basis) were engaged in R&D work – 9% of all employees of companies involved in R&D. Comparable figures for 2011 were 4,240 employees or 7.7% of all employees of R&D companies (2010:8.2%, 2009: 5.8%, 2008: 5.7%).

Table 5: Business Expenditure on R&D 2007 – 2012

	Cash Terms						Real Terms (2012 Prices) ³						% Change Real Terms	
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	11-12	07-12
Total Business Expenditure (£m)	185.1	183.9	323.7	344.0	388.8	461.3	209.4	201.6	347.2	357.8	395.3	461.3	16.7%	120.3%
In-house R&D (£m)	176.9	170.6	297.2	324.2	354.1	419.9	200.1	187.1	318.8	337.3	357.9	419.9	17.4%	109.9%
Non capital (£m)	165.3	152.2	235.0	230.0	321.2	377.5	187.0	166.9	252.0	239.3	326.6	377.5	15.6%	101.9%
Capital (£m)	11.6	18.4	62.2	94.2	32.8	42.4	13.1	20.2	66.7	98.0	33.3	42.4	27.1%	223.1%
Purchased R&D (£m)	8.2	13.3	26.5	19.8	34.7	41.4	9.3	14.6	28.4	20.6	35.3	41.4	17.3%	345.2%
In-house R&D Funding														
R&D Funded from own funds (£m)	139.6	145.8	242.5	264.0	294.1	350.5	157.9	159.9	260.1	274.6	299.0	350.5	17.2%	121.9%
R&D Funded by Government (£m)	20.6	22.7	50.4	57.3	54.2	41.9	23.3	24.9	54.1	59.6	55.1	41.9	-24.0%	79.8%
R&D (£m) Overseas/ Other	16.8	2.1	4.3	2.8	5.8	27.5	19.0	2.3	4.6	2.9	5.9	27.5	366.3%	44.7%

³ GDP deflator used to convert cash terms to real terms: 2007 (88.4), 2008 (91.2), 2009 (93.2), 2010 (96.1), 2011 (98.4), 2012=100

Table 5 continued: Business Expenditure on R&D 2007 – 2012

	Cash Terms						Real Terms (2012 Prices) ⁴						% Change Real Terms	
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	11-12	07-12
Ownership														
External Ownership (%)	57	60	73	68	74	78	57	60	73	68	74	78	5.4%	36.8%
Local Ownership (%)	43	40	27	32	26	22	43	40	27	32	26	22	-15.4%	-48.8%
Type of In-house Non capital Research														
Basic Research (£m)	15.8	8.0	13.5	18.4	7.3	11.8	17.9	8.8	14.5	19.1	7.4	11.8	59.0%	-34.0%
Applied Research (£m)	81.3	74.1	83.9	96.7	114	147.8	92.0	81.2	90.0	100.6	115.9	147.8	27.5%	60.7%
Experimental Development (£m)	68.2	70.1	137.7	114.9	200	218	77.2	76.9	147.7	119.5	203.4	218.	7.2%	182.5%
Size														
SME ⁵ (£m)	117.2	106.1	144.3	133.4	140.6	172.8	132.6	116.3	154.8	138.8	143.0	172.8	20.9%	30.3%
250+ (£m)	67.9	77.8	179.4	210.6	248.1	288.5	76.8	85.3	192.4	219.1	252.3	288.5	14.4%	275.5%

⁴ GDP deflator used to convert cash terms to real terms: 2007 (88.4), 2008 (91.2), 2009 (93.2), 2010 (96.1), 2011 (98.4), 2012=100

⁵ The European Commission definition of Small Medium Enterprises (SME) used is defined as being enterprises with less than 250 employees and large companies as being enterprises with more than 250 employees.

Table 5 continued: Business Expenditure on R&D 2007 – 2012

	Cash Terms						Real Terms (2011 Prices) ⁶						% Change Real Terms	
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	11-12	07-12
Sector⁷														
Manufacturing (%)	56	62	71	71	79	78	56	62	71	71	79	78	-1.3%	39.3%
Services and Other (%)	44	38	29	29	21	22	44	38	29	29	21	22	4.8%	-50.0%

⁶ GDP deflator used to convert cash terms to real terms: 2007 (88.4), 2008 (91.2), 2009 (93.2), 2010 (96.1), 2011 (98.4), 2012=100

⁷ SIC 2003 basis up to 2008, SIC 2007 basis thereafter. For definitions see Section 4, Background Notes

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT IN 2012

Table 6 details the headline results from the 2012 Business Expenditure on Research & Development (BERD) survey. The table shows that in 2012, total expenditure (in cash terms) on R&D by NI businesses was an estimated £461.3 million.

Total BERD consists of in-house R&D expenditure (i.e. R&D carried out within the company) and purchased R&D expenditure (i.e. R&D funded by firms in NI but undertaken by other firms in the UK and abroad). The vast majority of total BERD was in-house expenditure (£419.9m or 91%) with £41.4m or 9% being purchased R&D expenditure which increased from £34.7m in the previous year. Of this £41.4m of purchased R&D expenditure in NI, some £1.6m was undertaken by the Higher Education sector.

83% of funding for in-house R&D in 2012 came from the companies' own resources (£350.5m) while government provided a further 10% (or £41.9m) and the remainder came from overseas and other sources (7% or £27.5m).

Table 6: Business Expenditure on R&D – 2012

	Total Expenditure by Business (£million)	As % of Total Expenditure
Total Expenditure	461.3	100
In-house R&D Expenditure ⁸	419.9	91
of which:		
Non Capital Expenditure	377.5	82
Capital Expenditure	42.4	9
Purchased R&D Expenditure ⁹	41.4	9
Of which:		
Undertaken by Higher Education	1.6	0.3

Total employment on R&D in businesses for 2012 was 4,570 (based on full time equivalent figures), which was higher than that in 2011 (4,240) and 2010 (3,950).

^{8,10} For definitions see Section 4, Background Notes.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SECTORAL BREAKDOWNS

In 2012, the majority of R&D was carried out within the Manufacturing sector (78%) with the remaining 22% carried out in the Services & Other industries category. The contribution of the Services & Other industries to total expenditure steadily increased from 29% in 2003 to 44% in 2007 and then started to decrease thereafter - 2008 (38%), 2009 (29%), 2010 (29%) and 2011 (21%)

The manufacture of transport equipment sub-section (CL) accounted for 53% of all Manufacturing R&D (see Figure 4), up from 47% in 2011, with the manufacture of computer, electronic and optical products (CI) accounting for 19%.

Figure 4: Percentage of Manufacturing R&D Expenditure in 2012 by Sub-section (SIC 2007 basis)¹⁰

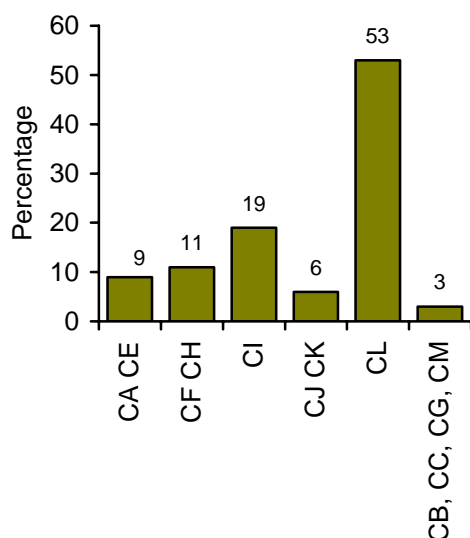
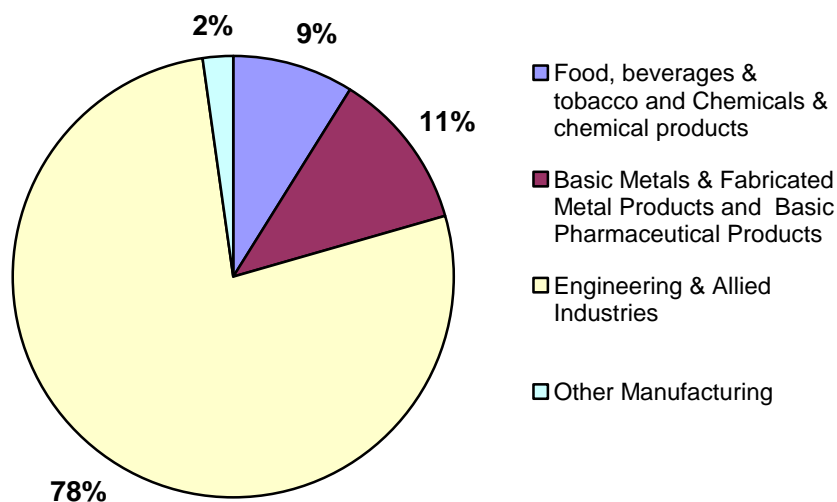


Figure 5 below, highlights that 78% of R&D spending within the Manufacturing sector was accounted for by companies involved in Engineering & Allied Industries (CI, CJ, CK, CL).

¹⁰ For a description of subsection headings see Section 4, Background Notes - Results.

Figure 5: Percentage of Manufacturing Expenditure by SIC 2007 Subsection¹⁰ 2012



Companies with 250 or more employees accounted for 63% of business R&D expenditure in 2012, although they represented only 9% of R&D performing companies. Small firms (i.e. those with less than 50 employees) represented some 69% of R&D performing companies and accounted for 14% of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)* accounted for 37.5% of the total business expenditure. Total SME expenditure increased by £32.1m (23%) from 2011 to 2012, in cash terms; and since 2007, SME expenditure has increased by 47% to £172.8m. The proportion that large companies (250+ employees) make to total R&D expenditure (63%) was slightly lower than the previous year (2011: 64%). See Annex 1 Table 3 for further details.

Figure 6: Percentage of Total BERD Expenditure in 2012 by Company Size

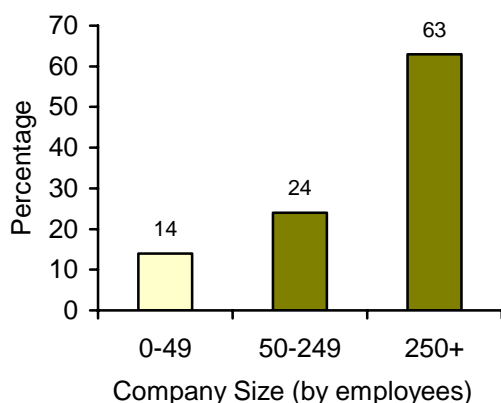


Table 7: In-house and Purchased R&D Expenditure by Sector 2012

	IN-HOUSE		PURCHASED	
	£m	% of Total BERD Expenditure	£m	% of Total BERD Expenditure
Manufacturing	325.5	71	33.8	7
Services & Other	94.4	20	7.6	2
All Industries ¹¹	419.9	91	41.4	9

As Table 7 shows, in-house R&D expenditure, i.e. spending carried out within the company, accounted for 91% (£419.9 million) of total expenditure in NI in 2012, equal to the proportion in 2011 (91%) and lower than 2010 (94%), 2009 (92%) and 2008 (93%). The majority of in-house R&D expenditure was in the Manufacturing sector as was the majority of purchased R&D expenditure.

The two components of in-house R&D expenditure are non capital expenditure (salaries & wages and other costs) and capital expenditure (land & buildings and plant & machinery).

Non capital expenditure makes up 90% of in-house expenditure, slightly lower than in 2011 (91%) but higher than 2010 (71%), 2009 (79%) and 2008 (89%). Table 8 and Figure 7 highlight that there were differences between sectors in the categories of in-house R&D spend.

The proportion spent on non capital is much greater than capital expenditure in both Manufacturing and in Services & Other. A larger proportion of non capital expenditure was spent on salaries and wages in the Services & Other sector (72% of total in-house expenditure) compared to 42% in the Manufacturing Sector. Within capital expenditure Manufacturing had more expenditure in Plant & Machinery than in Land & Buildings while the same was also true for Services and Other.

Salaries and Wages as a proportion of in-house expenditure have increased in Manufacturing from £100.2m (36%) in 2011 to £137.4m (42%) in 2012, the Services & Other sector also increased from £51.8m (70%) in 2011 to £68m (72%) in 2012.

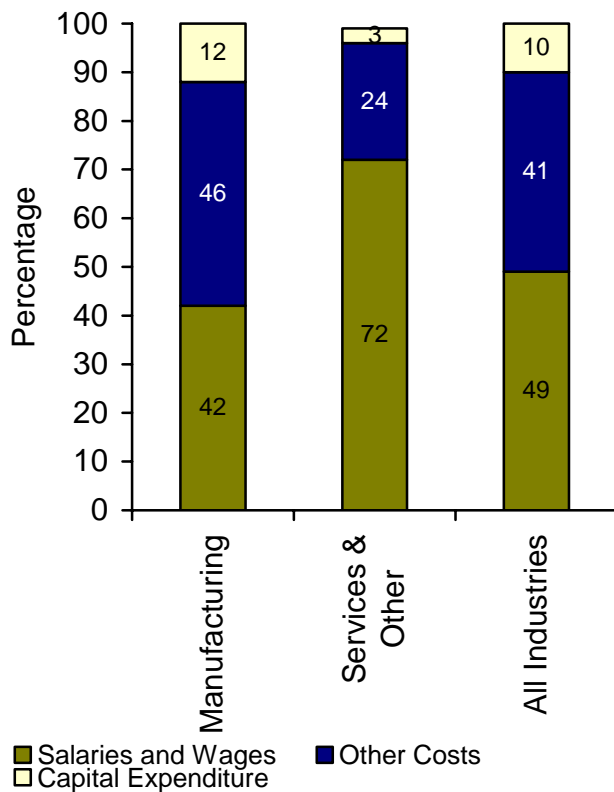
Over the year to 2012 the proportion spent on capital expenditure increased from 9% to 10%.

¹¹ All industries include Manufacturing, service sector industries plus a range of other industries. For full details of the other industries covered see Section 4, Background Notes.

Table 8: Breakdown of In-house R&D Expenditure by Sector (£million) 2012

	Manufacturing		Services & Other		All Industries	
	£m	%	£m	%	£m	%
Non Capital Expenditure						
Salaries & Wages	137.4	42%	68	72%	205.5	49%
Other Costs	149.0	46%	23.1	24%	172.0	41%
Capital Expenditure						
Land & Buildings	1.0	0%	0.1	0%	1.1	0%
Plant & Machinery	38.1	12%	3.2	3%	41.3	10%
In-house Expenditure	325.5	100%	94.4	100%	419.9	100%

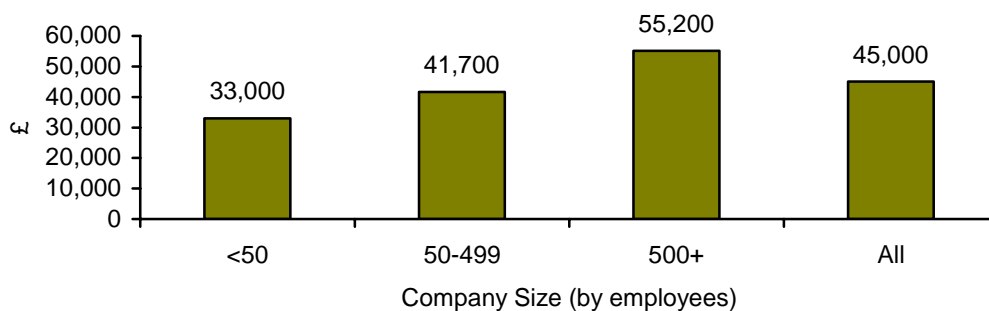
Figure 7: Percentage of In-house R&D Expenditure by Sector 2012



BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – NON CAPITAL EXPENDITURE

As Figure 8 below shows, there are differences in the level of salaries & wages per head between companies of different sizes (based on full-time equivalent (FTE) figures).

Figure 8: Salaries & Wages per Head by Company Size (rounded to nearest £100) 2012

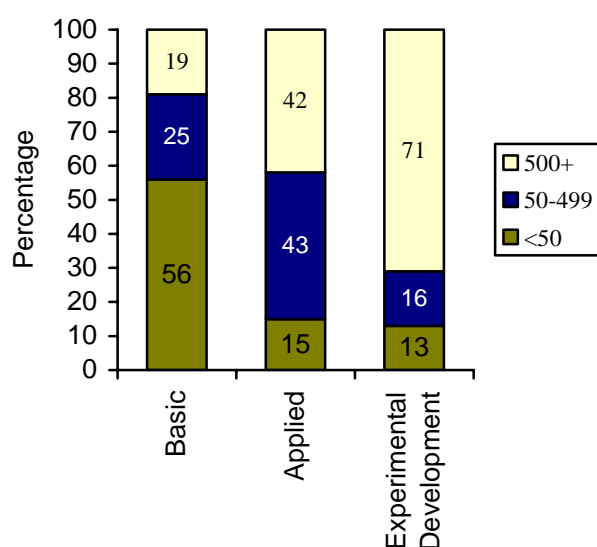


Overall the salaries and wages per R&D FTE was £45,000, an increase of 26% from £35,800 in the previous year. Salaries and wages per head for companies with 500 or more employees were £55,200. This compares with £33,000 per head for companies with less than 50 employees and £41,700 per head for companies with between 50 and 499 employees.

Table 9: Type of Research by Sector as percentage of All Research (Non Capital Expenditure) (percentages) 2012¹²

	Manufacturing %	Services and Other %	All Industries %
Basic	2	2	3
Applied	25	14	39
Experimental Development	49	9	58
All Research	76	24	100

Figure 9: Type of Research by Company Size (percentage) 2012



Non capital expenditure can also be analysed in terms of type of research carried out. Experimental development accounted for 58% of non capital expenditure in 2012, lower than that in 2011 (62%), with applied research and basic research accounting for 39% and 3% respectively.

Figure 9 shows that the majority of spending on applied research and basic development is carried out by companies with between 0 and 499 employees (58% and 81% respectively). 71% of spending on experimental research is carried out by companies with 500 or more employees. A detailed breakdown of the type of research carried out by both industry and company size is given in Annex Table 1.

¹² For definitions see Section 4, Background Notes - Definition of Terms.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SOURCES OF FUNDS

The funding of in-house R&D expenditure comes from a number of sources: the companies' own funds, from Government, overseas funding (e.g. EU) and other businesses and organisations.

Table 10: In-house BERD R&D Funding by Source and Company Size 2012

	<50	50-499	500+	All
	%	%	%	%
Own Funds NI	55	63	81	73
Own Funds Parent	14	31	1	11
Government	11	5	12	10
Overseas/Other	20	2	5	7
Total	100	100	100	100

Table 10 shows that the greatest proportion of R&D funding was from Own Funds NI – 73% in 2012, up from 64% in 2011 . 81% of R&D was funded by Own Funds NI in firms with over 500 employees compared to 55% and 63% in firms with fewer than 50 and between 50 and 499 employees, respectively.

Firms with under 50 employees and between 50 and 499 employees received a greater proportion of funds from parent companies (14% and 31% respectively) than firms with 500 or more employees (1%). The proportion of funding for R&D from own funds, NI and parent, was 69% for firms with under 50 employees, 94% for firms with between 50 and 499 employees and 82% for firms with 500 or more employees.

Firms with 500 or more employees reported the greatest proportion of funds from Government at 12% of funding, with a lower proportion for firms with fewer than 50 employees (11%), while firms with between 50 and 499 employees received 5% of funds from this source.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – OWNERSHIP ANALYSIS

The majority of BERD is accounted for by externally owned businesses. Since 2008, the percentage has been at least 60%.

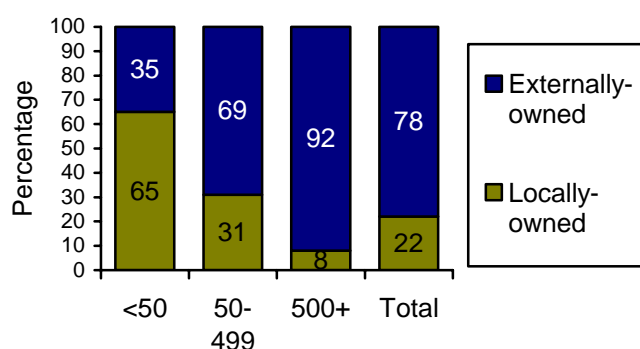
Table 11: Breakdown of R&D expenditure by ownership of company 2012

	£m	%	Number of companies	%
Locally-owned companies	102.2	22	405	82
Externally-owned companies	359.1	78	90	18
Total (All companies)	461.3	100	495	100

Expenditure by locally owned companies (£102.2m) has increased by 1.1% from £101.1m in 2011 while the number of these companies who reported R&D expenditure increased to 405 (from 369 in 2011).

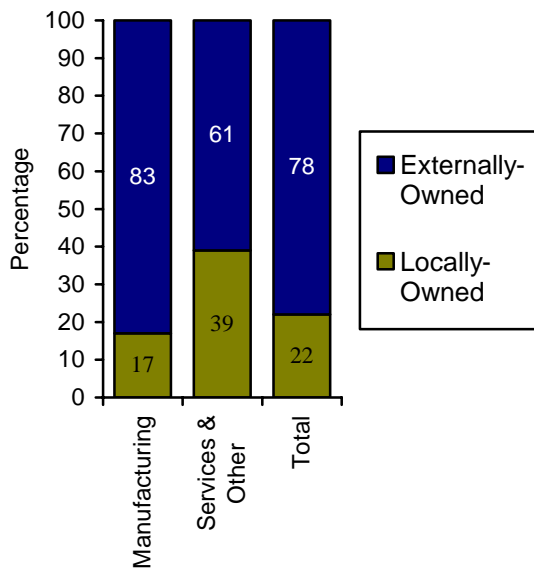
NI owned companies in 2012 accounted for 82% of all R&D performing companies and 22% of the total £461.3m expenditure. This can be compared with externally-owned companies accounting for 78% of the R&D expenditure and 18% of R&D performing companies.

Figure 10: Expenditure by ownership by company size (percentages) 2012



The majority of R&D spend in companies with under 50 employees (65%) was by NI owned firms. However, in companies with between 50 and 499 employees the larger proportion (69%) was by externally owned firms. The analysis shows that in companies with 500 or more employees the majority of R&D expenditure (92%) was also by externally-owned firms.

Figure 11: Expenditure by ownership by sector (percentages) 2012



Analysis of R&D spend split by ownership and sector showed that 83% of R&D spend in the Manufacturing sector was by externally-owned companies.

In the Services & Other sector, NI owned companies accounted for 39% of R&D expenditure.

Compared to the previous year locally-owned companies decreased their proportion of expenditure in both the Manufacturing (from 18% to 17%) and Services & Other sectors (from 57% to 39%).

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – EMPLOYMENT ON R&D

In 2012, companies surveyed reported a total of 6,310 employees working on R&D, approximately 9% of all employees in companies carrying out R&D which is lower than in 2011 (10%). Of these 6,310 employees involved in R&D activities, 5,100 (81%) were males and 1,210 (19%) were females. This compared to 5,440 employees in 2011 with 4,310 males and 1,130 females, representing 79% and 21% respectively.

By type of R&D employee, researchers accounted for 51%, technicians for 25% and other employees (e.g. support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects) for 24% of all R&D employees. Comparable full-time equivalent figures show that 2,540 employees were researchers (56%), 1,180 employees were technicians (26%) and the number of other employees was 850 (19%).

Figure 12: Employment on R&D in 2012 by gender (Headcount)

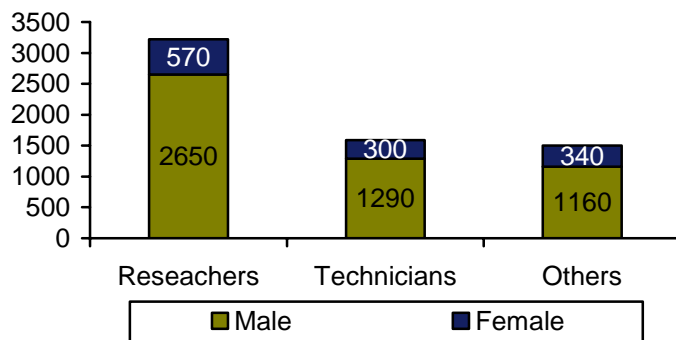
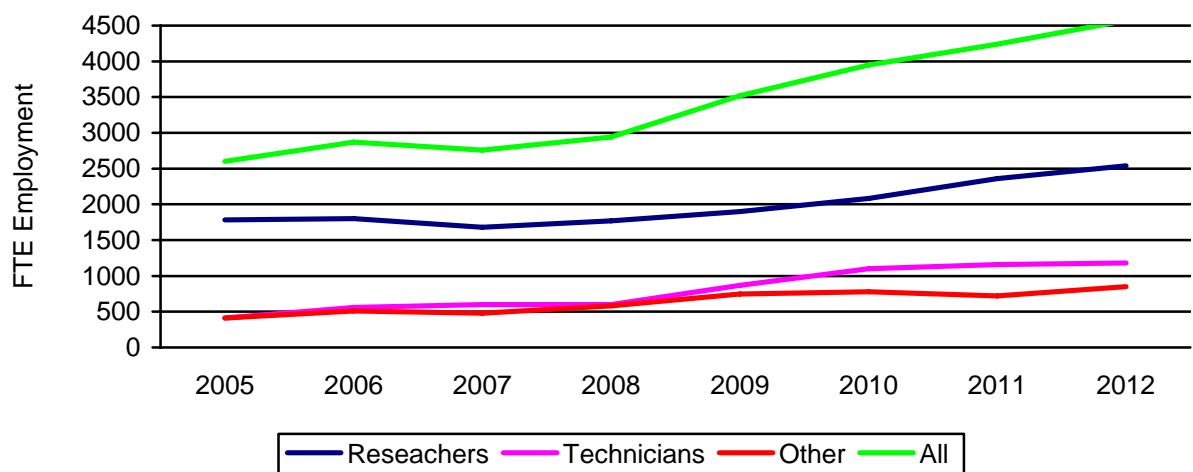


Figure 13: Employment on R&D 2005-2012 (FTE)



On a full-time equivalent basis there were 2,850 employees in Manufacturing and 1,710 in the Services & Other sectors. Within Manufacturing, researchers accounted for 57% of R&D employees with the level of technicians at 23% and other employees at 20%.

Within the Services & Other sectors, researchers made up 53% of R&D employees, technicians 31% and other employees 16%.

TAX CREDITS

Businesses were asked if they received any R&D tax credits and if their R&D work was part of a joint project in 2012, following the introduction of the question in the 2004 survey.

149 R&D performing companies reported that they received tax credits amounting to £37.2million in total. This represents an increase in the number of R&D performing companies receiving tax credits and an increase in the amount received when compared with last year.

Table 12: Breakdown of R&D Tax Credits 2007-2012

	2007	2008	2009	2010	2011	2012
Number of companies	52	57	77	80	136	149
Tax credit (£m)	26.3	9.5	21.7	19.2	35.3	37.2

JOINT PROJECTS

63 companies reported that their R&D work was part of a joint project with a source outside their company. 17 companies had a joint project with Higher Education Establishments, 34 with other Businesses and 12 with both. This shows an increase in the number of companies engaging in joint projects since last year (46 companies in 2011).

3: R&D Information from other sources

Business Expenditure on Research & Development in the Republic of Ireland

The biennial Business Expenditure on Research and Development (BERD) Survey 2011/2012 is jointly conducted by the Central Statistics Office (CSO) and Forfás and the most recent data was released by the CSO on 19 February 2013. This survey examines R&D activities performed across the business sector in 2011.

The key findings include:

Aggregate levels of BERD (2011)

- Enterprises across all business sectors in Ireland spent €1.86 billion on in-house research and development (R&D) activities in 2011, a 1.3% increase on 2010. Enterprises active in R&D in 2011 estimated an R&D spend of €1.96 billion in 2012, an increase of 5.5%.
- Business R&D intensity (BERD as a percentage of GDP) reached 1.17% in 2011 (1.46% of GNP). Finland had the highest BERD intensity in the EU with 2.67% of GDP.
- Foreign owned enterprises accounted for 71% of the total business R&D spend in 2011.
- The vast majority of expenditure on R&D by businesses (86%) in 2011 was current expenditure (wages of R&D staff etc.) and 14% on capital expenditure (e.g. buildings, equipment, licence payments etc.)
- 61% of BERD was generated in the services sector in 2011.
- Medium and large enterprises (more than 50 employees) accounted for almost three quarters of BERD in 2011.
- 89% of BERD funding was from company funds in 2011, down from 92% in 2009.

Human resources in R&D (2011)

- There were over 19,000 research personnel in the business sector, a 21% increase since 2009 and more than 14,000 full time equivalents (FTEs).
- More than half of R&D personnel (headcount) were employed in foreign owned firms.
- The majority of R&D personnel (63%) were employed in the services sector.
- Medium to large companies employed two thirds of all research personnel.
- There were 10,618 researchers or 8,996 FTEs employed in the business sector.
- Of total researchers in the business sector, 22% were female. Iceland had the highest proportion of female researchers in the business sector at 32%.
- 15% of all business sector researchers held a PhD qualification.

Number of R&D performing firms (2011)

- The number of R&D performing firms increased by 25% from 2009 to 2011 to over 1,600 and almost three quarter were Irish owned.
- Of firms engaged in R&D activities, 58% were in the services sector and 42% in manufacturing.
- Small firms with less than 50 employees accounted for 69% of all R&D active firms.
- More than 72% of all R&D performing enterprises spent less than €500k on R&D activities and one in ten enterprises were engaged in large scale R&D activities (spending in excess of €2 million)
- Half of foreign-owned firms engaged in mid to large scale R&D (in excess of 500k) compared with 19% of Irish firms

- Almost half of medium to large sized firms engaged in mid to large scale R&D activities compared with 18 per cent of small firms
- In both the manufacturing and services sectors, 27% of firms were engaged in mid to large scale R&D activities

Type of research (2011)

- R&D expenditure was mostly concentrated in experimental development, accounting for 71% of all expenditure.
- Nearly two-thirds of Irish enterprises were engaged in experimental development compared to three-quarters of foreign owned companies.
- Small enterprises were more likely to engage in applied research (28%) than medium and large enterprises (23%).

Collaboration

- Of all R&D performing firms, 35% engaged in joint research projects with other parties in 2011.
- 40% of medium to large firms engaged in collaborative research projects compared with 33% of small firms. Of all collaboration partners, both small and medium/ large firms were most likely to collaborate with Higher Education Institutes (HEIs) in Ireland.
- Foreign owned firms were more likely than Irish firms to collaborate with research partners, with 44% and 32% respectively engaged. Foreign owned firms were most likely to collaborate with other firms outside Ireland, and Irish firms with HEIs in Ireland.
- The most likely collaboration partner for all firms was HEIs in Ireland, rather than HEIs outside of Ireland or collaborations with other firms either within or outside Ireland

4: Business Expenditure on Research & Development – Background Notes

Northern Ireland Statistics and Research Agency

From the 1st April 2011, the responsibility for the collection of data and production of official labour market and economic statistics transferred from the Department of Enterprise, Trade and Investment (DETI) to the Northern Ireland Statistics and Research Agency (NISRA), an agency of the Department of Finance and Personnel (DFP). This transfer mirrored the position in Great Britain where most business surveys and labour market data collection and statistical production have been transferred from the departments with policy responsibilities to the Office for National Statistics (ONS). However, it is important to note that there are no planned changes to the production of economic and labour market statistical publications and outputs as a result of the transfer.

A quality report for the Northern Ireland Research and Development Statistic publication can be found at the following link:

<http://www.detini.gov.uk/deti-stats-index/stats-surveys/stats-research-development.htm>

Definition of R&D

The survey of Northern Ireland Business Expenditure on Research and Development during 2012 was undertaken by the Northern Ireland Statistics and Research Agency (NISRA). The sample and survey results only cover business enterprises. This excludes government organisations, higher education establishments and charities.

The definition of R&D adopted for the purposes of the NI inquiry is the same as that used by ONS for the equivalent GB survey and comes from the Frascati manual:

"The guiding line to distinguish between research and technological development activity (R&D) from non-research activity is the presence or absence of an appreciable element of novelty or innovation. If the activity departs from routine and breaks new ground it should be included; if it follows an established pattern it should be excluded".

The activities that are classified as R&D differ from company to company, but there are two basic models. In one model, the primary function of R&D is to develop new products; in the second model, the primary function of R&D is to discover and create new knowledge about scientific and technological topics with the purpose of uncovering and enabling development of new products, processes, and services. According to the Department for Business Innovation and Skills (BIS), R&D is defined as "any project to resolve scientific or technological uncertainty aimed at achieving an advance in science or technology".

For the purposes of National Statistics, R&D and related concepts follow internationally agreed standards defined by the Organisation for Economic Cooperation and Development (OECD), as published in the 'Frascati' Manual. R&D, in the Frascati Manual, is defined as "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".

The Frascati Manual was originally written by, and for, the experts in OECD member countries that collect and issue national data on R&D. The definitions provided in this manual are

internationally accepted and now serve as a common language for designing, collecting and using R&D data.

The NI questionnaire follows the same structure and includes the same questions as the GB questionnaire, although there were some modifications to tailor the questions asked for use in NI e.g. identification of Invest NI companies.

The survey covers expenditure in the year ending December 2012, although companies were given the option of supplying data for a business year ending on any date between 6 April 2012 and 5 April 2013.

Survey Design - Sample

R&D surveys pose special problems for survey design – R&D takes place in only a small proportion of businesses but a comprehensive list of these businesses does not exist. A simple random sample of the business population would not be suitable for an R&D survey because many of the sample businesses would not undertake R&D and many significant R&D performers would be missed in such a sample.

The solution is to implement a stratified sample design. The stratification variable was the known level of R&D performance of the businesses. This information was gained from previous surveys (mainly the 2011 survey) and extra information from various sources such as the Office for National Statistics (ONS), Invest NI and filter questions on the Annual Business Inquiry and Community Innovation Survey. For the purposes of the 2012 survey, businesses were stratified into 4 groups:

- (i) Businesses responding to the 2011 survey who returned or had estimated a total R&D expenditure value greater than zero;
- (ii) Businesses reporting positively to the R&D filter question in the Annual Business Inquiry and Community Innovation Survey; other identified potential R&D performers (principally, those companies who had received assistance from Invest NI during 2012); and companies newly identified to ONS as R&D spenders;
- (iii) Companies who have been identified as 'not R&D performers' when selected for past surveys;
- (iv) The remainder of Northern Ireland businesses.

The businesses making up strata (i) and (ii) formed a register of R&D performers and the sample for the 2012 survey was derived from this register. Indeed, each of these businesses was issued a questionnaire – in effect, therefore, a census of R&D performers was carried out. Strata (iii) and (iv) were not included as they were assumed to have zero R&D expenditure.

Survey Design - Response Rate

It is worth noting that a number of NI companies are part of national and international companies. Many concentrate their R&D at particular sites, not necessarily in NI, although all of their plants, including those in NI, will share in the benefits of research. For 2012, 1,296 forms were sent out to businesses believed to be performing R&D. Completed forms were returned by 1,077 businesses representing a response rate of 83 per cent. The total number of companies spending on R&D is relatively small – 495 in 2012 (and 430 in 2011).

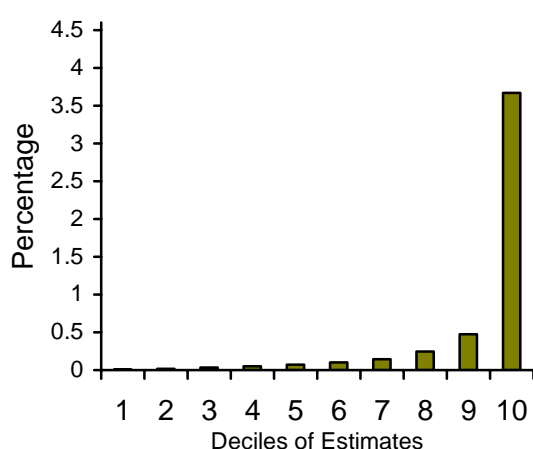
Survey Design – Validation and Estimation

Variations may occur in NI R&D data from year to year due to the influence of one or two large-scale projects. Estimates were made for the R&D activity of non-responding businesses. Estimates for Invest NI companies were based on the value of offers made to promote R&D investment, the amount remaining to be claimed against these offers, the frequency of claims and the contribution of Invest NI's assistance to total planned R&D expenditure. Estimates for Invest NI companies make up 68% of the total non-respondent companies. The remaining 32% - non Invest NI estimates were based on historical information and other administrative surveys within Economic and Labour Market Statistics Branch.

Overall, all estimates make up 4.8% of total BERD spend for 2012 (compared to 5.4% in 2011). Estimates for Invest NI companies account for 4.4% of total BERD spend while estimates for non Invest NI companies account for 0.5% of total BERD spend. This should be borne in mind when considering the results.

Figure 14 shows that all estimates made up 4.8% of total 2012 BERD spend. When estimates are ranked according to ascending size of spend, the last two deciles (i.e. the top 20% of companies) accounted for 86.2% of the total BERD estimated spend indicating that most of the estimates were small in magnitude. The bulk of the value of the estimates has been accounted for by a relatively small number of companies.

Figure 14: Deciles of Estimates as a percentage of 2012 BERD



Status of Figures in Current Bulletin

The results are provisional and may be revised should additional information become available usually due to business misreporting and late returns.

Figures contained within all tables in this release may not add due to rounding. Percentages calculated on these rounded figures may differ from those that are detailed in the text. Results are shown mainly by industrial sector and company size (based on the number of employees). The sectoral analyses are based on the Standard Industrial Classification 2007 (or SIC 2007) of industries. Data prior to 2009 are on a SIC 2003 basis. Care should therefore be taken when making comparisons with previous reports.

More details on SIC 2007 are available at the link below.

<http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html>

Definition of Terms

a) Type of R&D Expenditure

Total Expenditure on R&D - This covers expenditure by businesses, expenditure by higher education and other expenditure by Government.

Other Expenditure by Government - The ONS also collect annual data on Government-funded Science, Engineering and Technology for the UK as a whole and publish this in the Forward Look report. By utilising Forward Look data in conjunction with the results from the NISRA survey, it has been possible to compile a more complete picture of total expenditure on R&D in NI. Forward Look figures will include financial assistance to both higher education and to businesses by Government as well as expenditure on R&D conducted within Government Departments. The figures shown in Table 1, expenditure by businesses and higher education and other expenditure by Government, should complement each other; i.e. there should be no double counting.

In-house R&D – This is R&D carried out within the company and was previously referred to as intramural expenditure.

Purchase of R&D – This is R&D funded by plant(s) in Northern Ireland but undertaken by other firms or organisations in the UK and abroad and was previously referred to as extramural expenditure.

Capital Expenditure - Includes companies' expenditure on land, buildings, equipment and machinery (including vehicles). Capital expenditure on R&D is particularly subject to distortions and is likely to fluctuate significantly from year to year as a small number of projects could cause this percentage to increase or decrease sharply. For example, some R&D projects may have a duration of several years but involve heavy capital outlay in the formative years of the research. The erratic nature of R&D capital expenditure may partly explain differences in capital expenditure among companies of different sizes. Only by looking at underlying trends over several years will it be possible to see if some sectors or companies of differing sizes are more likely to require more expenditure of a capital nature.

b) Type of Research

Basic Research - work undertaken primarily for the advancement of scientific knowledge without a specific practical application in view.

Applied Research - Research undertaken with a general or a particular application in view.

Experimental Development - covers the use of the results of basic and applied research directed to the introduction of new materials, processes, products, devices and systems, or the improvement of existing ones. This includes the prototype or pilot plant stage, design and drawing required during R&D and innovation work done on contracts with outside organisations, Government departments and public bodies.

c) Sources of Funding

Business - Funds from individual plants within NI or from parent or other companies within the group.

Government - Funds from Invest NI and other government sources.

Overseas - This includes EU Funds as well as other funds from outside the UK. EU funds are those from the European Commission's Structural or Framework Funds.

Other Funds - Funds from private businesses, other public organisations and any other organisations within the UK.

d) Employment on R&D

Staff Types - Employment on R&D splits into the following categories; researchers – engaged in the conception or creation of new knowledge, products, methods and systems; technicians – who perform scientific and technical tasks normally under the supervision of researchers; and others – support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects.

Full Time Equivalent Employment – One full time equivalent (FTE) may be thought of as one person-year. For example, a person who normally spends 30% of their time on R&D and the rest on other activities would be considered as 0.3 FTE. Similarly, if a full-time R&D worker is employed at an R&D unit for only six months, this results in the FTE of 0.5. A person who works half of a standard week and spends half of their time on R&D and the rest on other activities should be considered as 0.25 FTE

SIC 2007 Classification

Manufacturing is defined to cover Section C, which includes the following groupings in this publication:

- CA Manufacture of food products, beverages and tobacco products
- CB Manufacture of textiles, wearing apparel, leather and related products
- CC Manufacture of wood and paper products; printing and reproduction of recorded media
- CD Manufacture of coke and refined petroleum products
- CE Manufacture of chemicals and chemical products
- CF Manufacture of basic pharmaceutical products and pharmaceutical preparations
- CG Manufacture of rubber and plastics products, and other non-metallic mineral products
- CH Manufacture of basic metals and fabricated metal products, except machinery and equipment
- CI Manufacture of computer, electronic and optical products
- CJ Manufacture of electrical equipment
- CK Manufacture of machinery and equipment n.e.c.
- CL Manufacture of transport equipment
- CM Other manufacturing; repair and installation of machinery and equipment

Where aggregation of Manufacturing groupings within this publication is required it is as follows (for example, see Figure 5):

- CA Food, beverages & tobacco
- CE Chemicals & chemical products
- CH Basic Metals & Fabricated Metal Products, except machinery & equipment
- CI, CJ, Engineering & Allied Industries
- CK, CL
- CB, CC, Other Manufacturing

CD, CF,
CG, CM

The Service Sector covers Sections G through to U, namely:

- G Wholesale and retail trade; repair of motor vehicles and motorcycles
- H Transportation and storage
- I Accommodation and food service activities
- J Information and communication
- K Financial and insurance activities
- L Real estate activities
- M-N Professional, scientific, technical, administrative and support service activities
- O-Q Public administration and defence, education, human health and social work activities
- R-U Other service activities

The Other Industries category covers:

- A Agriculture, forestry and fishing
- B Mining and quarrying
- D Electricity, gas, steam and air conditioning supply
- E Water supply; sewerage, waste management and remediation
- F Construction

Users and Uses of Data

A primary use of the business R&D data (BERD) in this Statistical Bulletin is its provision to ONS for inclusion in the UK published results. This in turn is a key component in measuring the UK's gross domestic expenditure on R&D.

Changes introduced as part of the amendments to the System of National Accounts (SNA) in 2008 and European System of Accounts (ESA) in 2010 specify R&D, from 2014 onwards, should not be considered as an ancillary activity and instead expenditure on R&D should constitute investment in R&D assets, which as a consequence needs to be capitalised in the UK National Accounts. Therefore R&D expenditure will now contribute to the compilation of the value of the UK's net worth and be included as part of Gross Domestic Product (GDP) estimates.

Within Government, the Department of Enterprise, Trade and Investment (DETI) rely upon R&D data to better inform policy development; this includes conducting economic research, appraisals and evaluation; providing Ministerial briefings and economic commentary, as well as responding to Assembly Questions. Below is a link to the Research, Development and Innovation page of the DETI website which outlines recent policy developments and how these are supported by the use of R&D statistics; and a second link providing an example of how the statistics are further utilised in a government research setting:

<http://www.detini.gov.uk/index/homepage-research-dev-innovation.htm>

http://www.niassembly.gov.uk/Documents/RaISe/Publications/2012/enterprise_trade_investment/2312.pdf

Invest NI use the data to better inform their decision making and investment strategies and to enhance their own internal research. The below link provides an example:

http://www.investni.com/index/already/product/research_and_development.htm

Outside government the data is used by a variety of different private sector and academic analysts to assist with industrial and investment decisions. The data is also used to inform the wider public about the shape of the Northern Ireland Economy.

http://www2.warwick.ac.uk/fac/soc/wbs/research/csme/research/working_papers/wp107.pdf

<http://www.agendani.com/reversing-rd-under-performance>

The Research and Development Society is a UK-based organisation formed to promote the better understanding of R&D in all its forms. The Society makes use of UK BERD data as a key source of information, for understanding how much UK businesses are investing in R&D on an annual business and to inform wider debates on the subject.

<http://www.rdsoc.org>

5: Northern Ireland Higher Education Expenditure on Research & Development during 2012

Table 13 details the headline results from the 2010, 2011 and 2012 Higher Education Expenditure on Research & Development (HERD) surveys.

Table 13: Higher Education Expenditure on R&D

	2010	2011	2012
	£million	£million	£million
HERD Expenditure ¹³	163.0	165.6	148.9
of which:			
Non Capital Expenditure	144.8	148.4	141.7
Capital Expenditure	18.3	17.2	7.2
Source of funding of R&D:			
Government Block Grant	81.3	84.4	78.9
OST Research Councils ¹⁴	14.2	13.1	12.4
UK-based charities	9.5	9.3	10.8
UK Cent Gov/Local Auth/Health ¹⁵	37.9	39.7	25.4
UK Ind/Comm/Pub Corp ¹⁶	3.6	4.5	5.3
EU Government	7.2	8.1	8.8
EU Other	2.1	2.2	2.1
Other Overseas	4.9	3.0	3.1
Other Sources	2.2	1.4	2.1
	Number	Number	Number
HERD Employment ¹⁷	1,690	1,550	1,500
of which:			
Academic staff	1,290	1,180	1120
Technicians ¹⁸	210	200	200
Other ¹⁹	190	170	180

Total HERD expenditure decreased by 10% from £165.6m in 2011 to £148.9m in 2012, compared with an increase of 1.6% from 2010 to 2011. The decrease in 2012 in-house expenditure was comprised of a 58% decrease in capital expenditure and a decrease of 4.6% in

¹³Expenditure for 2012 includes £1.6 million of expenditure funded by Northern Ireland businesses (£1.3m in 2011 and £1.2m in 2010). Therefore, net HERD in 2011 was £164.3m (this is as detailed in Table 1). All university expenditure on R&D is in-house expenditure - i.e. R&D work carried out within the university. Figures given are in £millions and constituent parts may not add due to rounding.

¹⁴ Office of Science and Technology Research Councils

¹⁵ Funding from UK Central Government, Local Authorities and Health Trusts/Hospitals

¹⁶ Funding from UK industry/commerce/public corporations

¹⁷ This is the number of full-time equivalents. Figures are rounded to the nearest 10 and constituent parts may not add due to rounding

¹⁸ Technicians – Perform scientific and technical tasks normally under the supervision of researchers.

¹⁹ Others -Support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects.

non capital expenditure. This compares to the previous period where capital expenditure decreased by 6% and non capital expenditure increased by 2.5%.

Employment totals decreased between 2011 and 2012, from 1,550 full-time equivalent persons in 2011 to 1,500 in 2012. The change in R&D employment consisted of a decrease in the number of academic staff (from 1,180 to 1,120), no change in the number of technicians (remaining at 200) and an increase in the number of other employees employed in R&D (from 170 to 180).

Block grants remained the largest source of funds with their relative contribution increasing from 50.9% in 2011 to 53.0% in 2012. Funding from UK Central Government/Local Authorities and Health Trusts/Hospitals decreased by 36.1% from £39.7m in 2011 to £25.4m in 2012, accounting for 17.0% of HERD funding in 2012 compared to 24.0% in 2011.

Table 13 details Higher Education Expenditure on R&D (HERD). The table gives combined results from the two Northern Ireland universities - i.e. Queen's University Belfast (QUB) and the University of Ulster (UU). The data collected refers to the academic year i.e. 2011/2012 ending 31/7/2012. The universities have made data available for this period on the basis of Transparency Review data collected within each respective institution.

Transparency Review

The Transparency Review is a Government initiative, introduced with the Comprehensive Spending Review (CSR) in 1998. The CSR awarded £1.5bn of additional funding for Higher Education, but the Treasury made this conditional on the sector becoming more open about the way public funds are spent in universities and colleges.

More detailed information on Transparency Review procedures in each of the local universities can be found at

<http://www.qub.ac.uk/directorates/FinanceDirectorate/CapitalandCosting/Costing/> for QUB and at http://www.ulster.ac.uk/finance/transparency_reviews.html for UU.

Total R&D Expenditure - Following consultation with the universities, it was agreed that all university expenditure on R&D is 'in-house' expenditure - i.e. R&D work carried out within the university.

Non Capital Expenditure – Includes expenditure on salaries and wages and other costs (materials, supplies, equipment and services).

Capital Expenditure - Includes expenditure on land, buildings, machinery and equipment. It should be noted that capital expenditure on R&D within universities is likely to fluctuate significantly from year to year. For example, an R&D project may have duration of several years but involve heavy capital outlay in the formative years of the research.

Source of funding – this is split into nine separate categories as shown in Table 13. For the purposes of this survey, the Government Block Grant was used as a 'balancing figure' with values for the other eight categories completed using data from the Transparency Review.

Employment on R&D – It is possible, using the results from the Transparency Review, to determine how much time members of staff spend on R&D. Figures shown have been rounded to the nearest 10

6: Annex

Table 1: Breakdown of In-House R&D Expenditure 2012 by employment size-bands (< 50 employees, 50 to 249 employees and 250+ employees) in £000s (rounded to nearest £100,000)

	Non Capital Expenditure						Capital Expenditure			Total In-House R&D Expenditure
	Salaries & Wages	Other Costs	Total Expenditure	Basic Research	Applied Research	Experimental Development	Lands & Building	Plant & Machinery	Total Expenditure	
Manufacturing										
<50	6,800	6,700	13,500	1,700	5,600	6,100	*	*	1,000	14,500
50- 249	39,400	29,200	68,600	*	*	23,500	*	*	5,100	73,700
250+	91,200	113,000	204,300	*	*	155,800	*	*	33,100	237,400
Total	137,400	148,900	286,300	6,100	94,900	185,400	1,000	38,100	39,200	325,500
Services & Other										
<50	30,600	12,300	42,900	4,800	16,100	22,000	*	*	1,700	44,600
50 -249	17,800	5,000	22,700	*	*	6,000	*	*	500	23,200
250+	19,600	5,900	25,600	*	*	4,600	*	*	1,100	26,600
Total	68,000	23,100	91,200	5,700	52,800	32,700	100	3,200	3,200	94,400
All Industries										
<50	37,400	18,900	56,400	6,500	21,700	28,100	*	*	2,700	59,100
50-249	57,200	34,100	91,300	2,700	59,100	29,500	800	4,700	5,500	96,800
250+	110,900	119,000	229,800	2,500	66,900	160,400	*	*	34,100	264,000
Total	205,500	172,000	377,500	11,800	147,700	218,000	1,100	41,300	42,400	419,900

*Disclosive

Totals may not sum due to rounding

Table 2: Breakdown of Purchased R&D Expenditure 2012 by employment size-bands (< 50 employees, 50 to 249 employees and 250+ employees) in £000s (rounded to nearest £100,000)

		Purchased R&D Expenditure			
		Work commissioned within NI	Work commissioned within GB	Work carried out outside the UK	Total Purchased R&D Expenditure
Manufacturing					
	<50	200	100	900	1,200
	50-249	*	*	*	*
	250+	*	*	*	*
	Total	12,900	4,700	16,200	33,800
Services & Other					
	<50	1,200	900	800	2,900
	50-249	*	*	*	*
	250+	*	*	*	*
	Total	2,100	1,000	4,600	7,600
All Industries					
	<50	1,400	1,000	1,600	4,100
	50-249	600	600	11,600	12,800
	250+	13,000	4,000	7,600	24,500
	Total	15,000	5,600	20,800	41,400

*Disclosive
Totals may not sum due to rounding

Table 3: Breakdown of Business Expenditure on R&D (BERD) by Small and Medium Sized Enterprises (SMEs <250 employees) 2001-2012 (£m)²⁰

	R&D Expenditure											2012
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
SMEs (<250)												
In- house	40.2	63.2	53.2	54.8	69.4	73.4	110.5	98.3	123.0	119.7	119.4	155.9
Purchased	3.3	3.6	3.2	7.5	5.5	8.2	6.8	7.9	21.3	13.7	21.2	16.9
Total	43.4	66.8	56.4	62.3	74.9	81.6	117.2	106.1	144.3	133.4	140.6	172.8
(250+)												
In- house	109.8	86.1	63.3	65.4	78.4	83.2	66.4	72.3	174.2	204.5	234.6	264.0
Purchased	1.8	3.8	1.6	1.4	1.0	2.2	1.4	5.5	5.3	6.1	13.5	24.5
Total	111.6	89.9	64.9	66.8	79.4	85.4	67.9	77.8	179.4	210.6	248.1	288.5
All												
In- house	149.9	149.3	116.5	120.2	147.8	156.6	176.9	170.6	297.2	324.2	354.1	419.9
Purchased	5.1	7.3	4.8	8.8	6.5	10.4	8.2	13.3	26.5	19.8	34.7	41.4
Total	155.0	156.6	121.3	129.0	154.3	167.0	185.1	183.9	323.7	344.0	388.8	461.3

Totals may not sum due to rounding

²⁰The European Commission definition of Small Medium Enterprises (SME) used is defined as being enterprises with less than 250 employees.

Table 4: Breakdown of 2012 R&D Employment by gender, employment size-band and Full time Equivalent (FTE) (rounded to nearest 10)

		Researchers				Technicians				Other				All Types			
		Male	Female	Total	FTE	Male	Female	Total	FTE	Male	Female	Total	FTE	Male	Female	Total	FTE
Manufacturing																	
Employment Size-bands	<50	*	*	150	100	*	*	120	80	*	*	240	120	450	70	520	300
	50-249	*	*	640	480	*	*	340	220	*	*	410	*	1,150	230	1,380	840
	250+	*	*	1,200	1,050	340	100	440	340	*	*	390	*	1,660	370	2,030	1,710
	Total	1,650	340	1,990	1,630	740	150	890	650	860	190	1,050	570	3,260	670	3,930	2,850
Services & Other																	
Employment Size-bands	<50	*	*	600	440	*	*	340	260	*	*	220	130	920	240	1,160	830
	50-249	*	*	290	210	*	*	170	130	*	*	180	*	470	170	640	480
	250+	*	*	340	250	150	50	190	140	*	*	50	*	450	130	580	400
	Total	1,000	240	1,230	900	550	150	700	530	300	150	450	280	1,840	540	2,380	1,710
All Industries																	
Employment Size-bands	<50	630	120	750	540	400	60	460	340	340	130	470	250	1,370	310	1,680	1,140
	50-249	770	160	930	690	400	100	500	350	450	140	590	270	1,620	400	2,020	1,320
	250+	1,250	290	1,550	1,300	490	140	630	490	380	60	440	320	2,120	500	2,610	2,110
	Total	2,650	570	3,230	2,540	1,290	300	1,590	1,180	1,160	340	1,500	850	5,100	1,210	6,310	4,570

*Disclosive

Totals may not sum due to rounding

User Engagement

We welcome any feedback you might have in relation to this report, and would be particularly interested in knowing how you make use of these data to inform your work. Please contact us at statistics@dfpni.gov.uk

Next Publication

The next bulletin will be published in December 2014.

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