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**Business Activity**

**Statistics Bulletin**

# Northern Ireland Research & Development Statistics 2010

14 December 2011



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## National Statistics

The Northern Ireland Research and Development Statistics 2010 is a National Statistic which is due to be assessed by the UK Statistics Authority.

## 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.

# 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; employment in R&D.

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

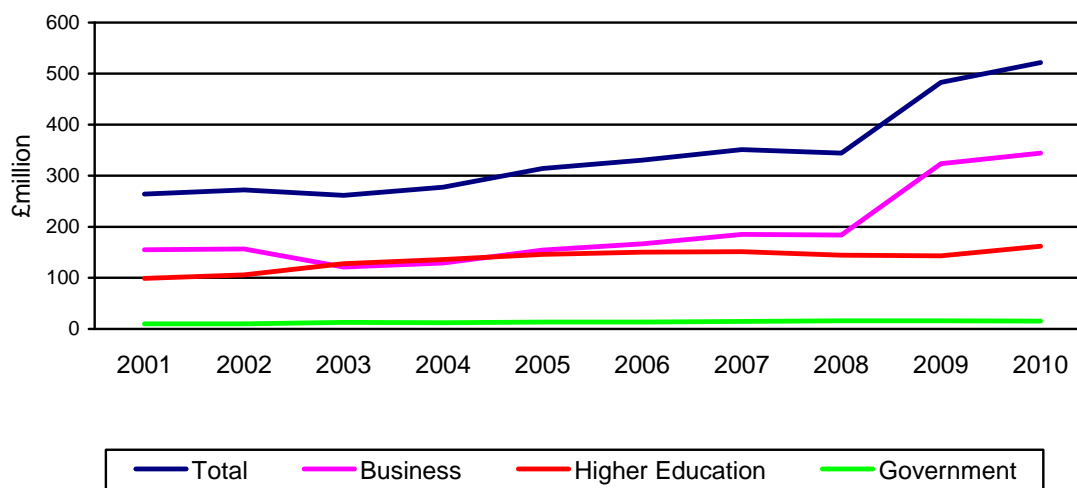
All companies believed to be performing R&D were included in the survey - in effect, therefore, a census of known R&D performers was carried out. A total of 1,021 returns were received by the Department – some 89% of those identified.

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 2% of the value of total Business Expenditure on R&D (BERD) for 2010. 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 2001-2010 (£million)



**Table 1: Total Expenditure on R&D in Cash Terms 2001-2010 (£million)**

	<b>Business</b>	<b>Higher Education</b>	<b>Government</b>	<b>Total</b>
<b>2001</b>	155.0	98.8	10.0	263.8
<b>2002</b>	156.6	105.8	10.1	272.5
<b>2003</b>	121.3	127.8	12.7	261.8
<b>2004</b>	129.0	136.1	12.3	277.4
<b>2005</b>	154.3	146.2	13.6	314.1
<b>2006</b>	167.0	150.1	13.7	330.8
<b>2007</b>	185.1	151.3	14.7	351.1
<b>2008</b>	183.9	144.2	15.9	344.0
<b>2009</b>	323.7	143.0	16.1	482.8
<b>2010</b>	344.0	161.8	15.6	521.4

### **Total Expenditure on R&D in Cash Terms**

Total expenditure on Research and Development in Northern Ireland in cash terms was £521.4 million(m) in 2010, of which £344.0m (66%) was spent by businesses, £161.8m (31%) by the Higher Education sector and the remainder, £15.6m (3%) was Government expenditure.

There was an increase of £38.6m (8%) in cash terms in Northern Ireland total R&D expenditure between 2009 and 2010 to £521.4m. This increase was comprised of rises in Business R&D expenditure of £20.3m (6%) and in Higher Education expenditure of £18.8m (13%) and a decrease in Government expenditure of £0.5m (-3%). Over the last five years total R&D spending in cash terms in NI has risen by 66% and by 98% since 2001.

## Historical Expenditure (Real terms)

Figure 2: Expenditure on R&D in Real Terms 2001-2010 (£million)<sup>1</sup>

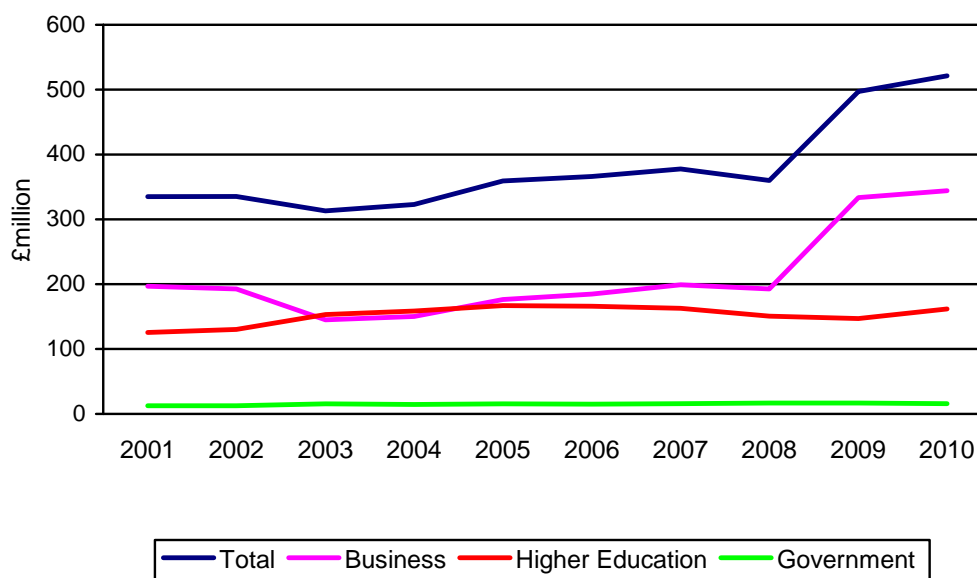


Table 2: Total Expenditure on R&D in Real Terms 2001-2010 (£million)

	Business	Higher Education	Government	Total
2001	196.8	125.5	12.7	335.0
2002	192.6	130.2	12.4	335.2
2003	145.1	152.9	15.2	313.2
2004	150.2	158.4	14.3	322.9
2005	176.4	167.2	15.5	359.1
2006	184.7	166.0	15.1	365.9
2007	199.1	162.7	15.8	377.6
2008	192.4	150.9	16.6	360.0
2009	333.3	147.2	16.6	497.1
2010	344.0	161.8	15.6	521.4

<sup>1</sup> GDP deflator used to convert cash terms to real terms: e.g. 2005 (87.5), 2006 (90.4), 2007 (93.0), 2008 (95.6), 2009 (97.1), 2010=100

## **Total Expenditure on R&D in Real Terms**

In real terms, total expenditure increased by £24.3m or 5% from £497.1m in 2009 to £521.4m in 2010.

In 2010 the Northern Ireland Business sector again accounted for a greater share of total R&D expenditure (66%) than the Higher Education sector (31%). In 2009 the figures were 67% and 30% respectively.

Over the last five years (2005-2010) total R&D spending in real terms in NI has risen by 45% and by 56 % since 2001.

Over the year to 2010 there was an increase in expenditure by Businesses and Higher Education while a decrease occurred in Government expenditure. In real terms, expenditure by Businesses increased by £10.7m (3%), Higher Education increased by £14.6 (10%) and Government expenditure decreased by £1m (-6%) in real terms over the year.

Business R&D expenditure rose by 95% between 2005 and 2010 in real terms and by 75% between 2001-2010.

**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**

Spending carried out within a company in Northern Ireland (in-house), accounted for 94% (£324m) of total business expenditure in 2010. In-house expenditure increased by 9% between 2009 and 2010.

## **Business R&D: Sectoral Analysis**

In 2010, the majority of R&D was carried out within the Manufacturing sector (71%) with the remainder (29%) carried out in the Services & Other sector. The share of expenditure in the Manufacturing sector compared to the previous year has remained unchanged .

Over the year to 2010, increases in expenditure occurred in both the Manufacturing sector and the Services & Other sector. The increase in expenditure in the Manufacturing sector, (£16.9m or 7.4%) was bigger in value and proportional terms than the increase of £3.4m (3.6%) in the Services & Other sector.

The sectoral analyses are based on the Standard Industrial Classification 2007 (or SIC 2007) of industries for the 2009 and 2010 publications. 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 61% of business R&D expenditure in 2010, although they represented only 10% 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 just under a fifth (17%) of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)\* accounted for 39% of the total business expenditure. Total SME expenditure fell by £10.9m (-8%) from 2009 to 2010, in cash terms. However, since 2005 SME expenditure has increased by 78% to £133.4m. The proportion that

large companies (250+ employees) make to total R&D expenditure (61%) was more than in the previous two years (2009: 55%; 2008: 42%).

\*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 (81%), with 18% from Government, 1% from overseas and other sources. The proportion of funding from own funds decreased marginally from 82% in 2009 to 81% in 2010.

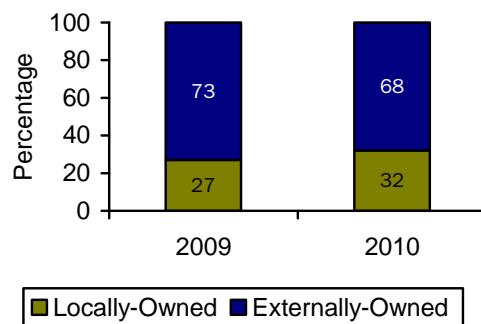
### **Business R&D: Ownership**

Companies with ownership outside NI play an important role in financing R&D activities in the region. Almost three quarters, £234.0m (68%) of total R&D spend was by such externally-owned companies although they accounted for 12% of all R&D performing companies. Their contribution to the total R&D spend was lower than in 2009 (73%) and their cash value decreased by £3.0m over the same period.

R&D expenditure by locally-owned companies increased by 27% (£23.2m) between 2009 and 2010 while R&D Expenditure by externally-owned companies decreased by 1.3% (-£3.0m).

The majority of R&D expenditure in Manufacturing is carried out by externally-owned companies (80%), compared with the Services & Other sector (38%).

**Figure 3: Expenditure by Ownership 2009-2010 (percentages)**



### **Business R&D: Employment**

In 2010, companies surveyed reported a total of 5,230 employees working on R&D, some 11% of all employees in companies carrying out R&D. The full time equivalent figure (FTE) for the same period was 3,950.

The number of R&D employees increased by 12% over the year to 2010.

**Table 3: R&D Employment 2005-2010**

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

### **Higher Education R&D**

R&D expenditure in the Higher Education sector increased by 13% in cash terms between 2009 and 2010 (from £144.1m to 163.0m). Net expenditure in 2010 (excluding spend by businesses undertaken by higher education) was £161.8m.

Half of funding (50%) for Higher Education R&D in 2010 came from the Government block grant (£81.3m). In 2010, there were some 1,690 full-time equivalent employees in the Higher Education sector engaged in R&D, decreasing from 1,700 employees in 2009.

### **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 Northern Ireland (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 Northern Ireland (in-house), accounted for 94% (£324.2m) of total business expenditure in 2010.

Of the 12 UK regions, nine showed an increase in in-house business R&D expenditure in cash terms over the year to 2010, including Northern Ireland which increased by 9.1%. This was the second highest percentage increase across the UK regions. In the UK as a whole such expenditure increased by 3.7%. Changes varied from an increase of 14.5% in the East Midlands to a decrease of 3.5% in the North East.

Over the two year period 2008 to 2010, in-house business R&D expenditure in cash terms in Northern Ireland increased by 89%. In the UK as a whole such expenditure rose by 1.6%.

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 (2009-2010)
	2009	2010	
UK	15497	16067	3.7
England	14327	14877	3.8
North East	308	297	-3.5
North West	1907	2047	7.3
Yorkshire & The Humber	452	491	8.5
East Midlands	998	1143	14.5
West Midlands	847	892	5.2
South West	1277	1362	6.7
East of England	3930	3986	1.4
London	909	902	-0.8
South East	3698	3758	1.6
Wales	243	244	0.3
Scotland	630	622	-1.2
Northern Ireland	297	324	9.1

Note: Data for UK and GB regions are from the Office for National Statistics

## R&D Investment Rate

Regional Gross Value Added (GVA) for 2010 released by the Office for National Statistics (ONS) on the 14th December 2011 shows that Northern Ireland 2010 in-house R&D as a proportion of GVA was 1.2% and was the sixth highest of the twelve UK regions (a lower proportion was recorded in West Midlands (1.0%), North East (0.7%), Scotland (0.6%), Yorkshire & The Humber (0.5%) Wales (0.5%), and London (0.3%)). Northern Ireland in-house R&D as a proportion of GVA is the same as 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 (2009) 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 2006-08 55% of NI SMEs were innovation active, compared to 57% during 2004-06. The equivalent UK figures also showed a decrease from 64% to 58%. The survey also reported that that 23% 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 2009 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 2009 can be found on the Office for National Statistics website at:

<http://www.ons.gov.uk/ons/rel/elmr/economic-and-labour-market-review/no--3--march-2010/first-findings-from-the-uk-innovation-survey-2009.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 Northern Ireland<sup>2</sup>.

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 2005 and 2010 total business expenditure on R&D increased by 95% in real terms, with in-house R&D increasing by 92% and purchased R&D expenditure increasing by 166%. Government funding increased by 10% over the year, business expenditure from own funds increased by 6% and other sources of funding decreased by 37%.

The ten biggest R&D spenders in 2010 accounted for 59% of total expenditure which is greater than the proportion in 2009 (57%). This is the largest proportion of total spend since 2002.

The proportion of total expenditure by the top ten companies for each R&D survey from 2001 is as follows – 57% in 2009, 41% in 2008, 49% in 2007, 44% in 2006, 47% in 2005, 44% in 2004, 46% in 2003, 60% in 2002 and 69% in 2001.

#### In cash terms

In 2010, 44 companies spent more than £1 million on R&D, three less than in 2009, three more than the number in 2008, ten more than the number in 2007, thirteen more than the number in

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<sup>2</sup> 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>

2006 and fourteen more than in 2005 and 2004. This is compared with 26 in 2003, 25 companies in 2002, 19 in 2001, 20 in 1999, 16 in 1996 and 9 in 1993. Average in-house R&D expenditure was £82,032 per R&D employee in 2010, 3% lower than the figure of £84,635 per R&D employee in 2009, (employees are on a Full-Time Equivalent basis).

In 2010, 3,950 employees (on a Full-time Equivalent (FTE) basis) were engaged in R&D work – 8.2% of all employees of companies involved in R&D. Comparable figures for 2009 were 3,520 employees or 5.8% of all employees of R&D companies (2008:5.7% 2007: 5.7%, 2006: 5.9%, 2005: 5.2%, 2004: 5.2% and 2003: 6.3%).

**Table 5: Business Expenditure on R&D 2005 – 2010**

	Cash Terms						Real Terms (2010 Prices) <sup>3</sup>						% Change Real Terms	
	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	09-10	05-10
Total Business Expenditure (£m)	154.3	167.0	185.1	183.9	323.7	344.0	176.4	184.7	199.1	192.4	333.3	344.0	3.2%	95.0%
In-house R&D (£m)	147.8	156.6	176.9	170.6	297.2	324.2	169.0	173.2	190.2	178.5	306.0	324.2	5.9%	91.9%
Non capital (£m)	130.3	142.5	165.3	152.2	235.0	230.0	149.0	157.6	177.8	159.3	242.0	230.0	-4.9%	54.4%
Capital (£m)	17.4	14.1	11.6	18.4	62.2	94.2	19.9	15.6	12.5	19.3	64.0	94.2	47.1%	373.5%
Purchased R&D (£m)	6.5	10.4	8.2	13.3	26.5	19.8	7.4	11.5	8.8	13.9	27.3	19.8	-27.4%	166.4%
<b>In-house R&amp;D Funding<sup>4</sup></b>														
R&D Funded from own funds (£m)	129.3	127.5	139.6	145.8	242.5	264.0	147.8	141.0	150.1	152.6	249.7	264.0	5.7%	78.6%
R&D Funded by Government (£m)	17.3	24.2	20.6	22.7	50.4	57.3	19.8	26.8	22.2	23.8	51.9	57.3	10.4%	189.7%
R&D (£m) Other	7.6	15.2	16.8	2.1	4.3	2.8	8.7	16.8	18.1	2.2	4.4	2.8	-36.8%	-67.8%

<sup>3</sup> GDP deflator used to convert cash terms to real terms: 2005 (87.5), 2006 (90.4), 2007 (93.0), 2008 (95.6), 2009 (97.1), 2010=100

<sup>4</sup> R&D Funding sums to Total BERD for 2005 and 2006

**Table 5 continued: Business Expenditure on R&D 2005 – 2010**

	Cash Terms						Real Terms (2010 Prices) <sup>5</sup>						% Change Real Terms	
	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	09-10	05-10
<b>Ownership</b>														
External Ownership (%)	53	53	57	60	73	68	53	53	57	60	73	68	-6.8%	28.3%
Local Ownership (%)	47	47	43	40	27	32	47	47	43	40	27	32	18.5%	-31.9%
<b>Type of In-house Non capital Research</b>														
Basic Research (£m)	7.5	8.1	15.8	8.0	13.5	18.4	8.6	9.0	17.0	8.4	13.9	18.4	32.4%	114.6%
Applied Research (£m)	54.9	67.0	81.3	74.1	83.9	96.7	62.8	74.1	87.4	77.5	86.4	96.7	11.9%	54.1%
Experimental Development (£m)	68.0	67.4	68.2	70.1	137.7	114.9	77.7	74.6	73.3	73.4	141.8	114.9	-19.0%	47.8%
<b>Size</b>														
SME <sup>6</sup> (£m)	74.9	81.6	117.2	106.1	144.3	133.4	85.6	90.3	126.0	111.0	148.6	133.4	-10.2%	55.8%
250+ (£m)	79.4	85.4	67.9	77.8	179.4	210.6	90.8	94.5	73.0	81.4	184.7	210.6	14.0%	132.0%

<sup>5</sup> GDP deflator used to convert cash terms to real terms: 2005 (87.5), 2006 (90.4), 2007 (93.0), 2008 (95.6), 2009 (97.1), 2010=100

<sup>6</sup> 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 2005 – 2010**

	Cash Terms						Real Terms (2010 Prices) <sup>7</sup>						% Change Real Terms	
	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	09-10	05-10
<b>Sector<sup>8</sup></b>														
Manufacturing (%)	65	63	56	62	71	71	65	63	56	62	71	71	0.0%	9.2%
Services and Other (%)	35	37	44	38	29	29	35	37	44	38	29	29	0.0%	-17.1%

<sup>7</sup> GDP deflator used to convert cash terms to real terms: 2005 (87.5), 2006 (90.4), 2007 (93.0), 2008 (95.6), 2009 (97.1), 2010=100

<sup>8</sup> SIC 2003 basis up to 2008, SIC 2007 basis thereafter. For definitions see Section 4, Background Notes

## BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT IN 2010

Table 6 details the headline results from the 2010 Business Expenditure on Research & Development (BERD) survey. The table shows that in 2010, total expenditure (in cash terms) on R&D by Northern Ireland businesses was an estimated £344.0 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 Northern Ireland but undertaken by other firms in the UK and abroad). The vast majority of total BERD was in-house expenditure (£324.2m or 94%) with £19.8m or 6% being purchased R&D expenditure which decreased from £26.5m in the previous year. Of this £19.8m of purchased R&D expenditure in Northern Ireland, some £1.2m was undertaken by the Higher Education sector.

81% of funding for in-house R&D in 2010 came from the companies' own resources (£264.1m) while government provided a further 18% (or £57.3m) and the remainder came from overseas and other sources (1% or £2.8m).

**Table 6: Business Expenditure on R&D – 2010**

	Total Expenditure by Business (£million)	As % of Total Expenditure
Total Expenditure	344.0	100
In-house R&D Expenditure <sup>9</sup>	324.2	94
of which:		
Non Capital Expenditure	230.0	71
Capital Expenditure	94.2	29
Purchased R&D Expenditure <sup>10</sup>	19.8	6
Of which:		
Undertaken by Higher Education	1.2	0.4

Total employment on R&D in businesses for 2010 was 3,950 (based on full time equivalent figures), which was higher than that in 2009 (3,520) and 2008 (2,940).

<sup>9,10</sup> For definitions see Section 4, Background Notes.

## BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SECTORAL BREAKDOWNS

In 2010, the majority of R&D was carried out within the Manufacturing sector (71%) with the remaining 29% carried out in the Services & Other industries category. The proportion carried out by Services & Other industries in 2010 (29%), 2009 (29%) and 2008 (38%) have seen a reversal in the upward trend in the contribution of the Services & Other industries to total expenditure which had been increasing from 29% in 2003, 33% in 2004, 35% in 2005, 37% in 2006 and 44% in 2007.

The manufacture of transport equipment sub-section (CL) accounted for 44% of all Manufacturing R&D (see Figure 4) with the manufacture of computer, electronic and optical products (CI) accounting for 16%.

**Figure 4: Percentage of Manufacturing R&D Expenditure in 2010 by Sub-section (SIC 2007 basis)<sup>11</sup>**

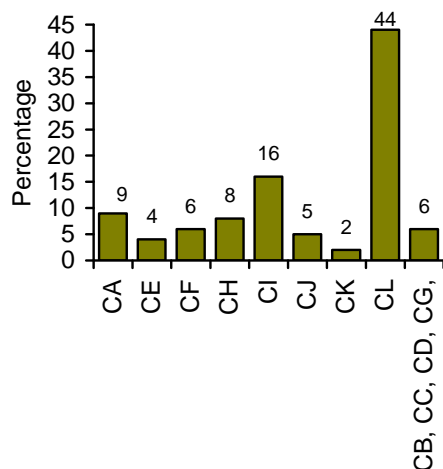
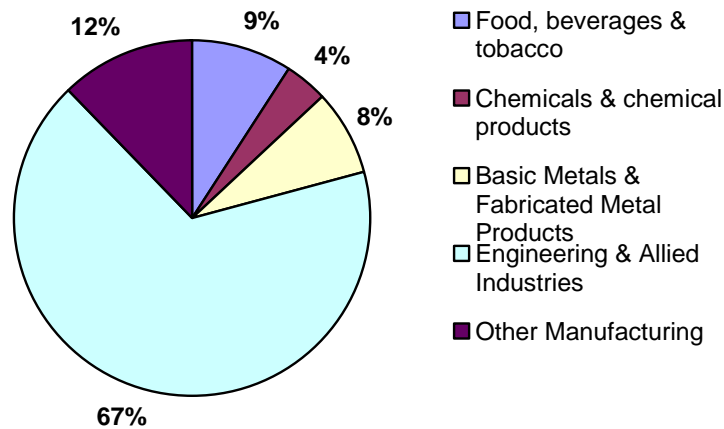


Figure 5 below, highlights that 67% of R&D spending within the Manufacturing sector was accounted for by companies involved in Engineering & Allied Industries (CI, CJ, CK, CL).

<sup>11</sup> For a description of subsection headings see Section 4, Background Notes - Results.

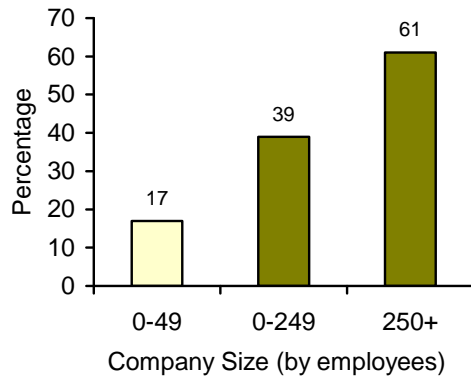


**Figure 5: Percentage of Manufacturing Expenditure by SIC 2007 Subsection<sup>10</sup> 2010**



Companies with 250 or more employees accounted for 61% of business R&D expenditure in 2010, although they represented only 10% 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 just under a fifth (17%) of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)\* accounted for 39% of the total business expenditure. Total SME expenditure fell by £10.9m (-8%) from 2009 to 2010, in cash terms. However, since 2005 SME expenditure has increased by 78% to £133.4m. The proportion that large companies (250+ employees) make to total R&D expenditure (61%) was more than in the previous two years (2009: 55%; 2008: 42%; 2007: 37%, 2006: 51%, 2005: 51%, 2004: 52%, 2003: 54%, 2002: 57%, 2001: 72%). See Annex 1 Table 3 for further details.

**Figure 6: Percentage of Total BERD Expenditure in 2010 by Company Size**



**Table 7: In-house and Purchased R&D Expenditure by Sector 2010**

	IN-HOUSE		PURCHASED	
	£m	% of Total BERD Expenditure	£m	% of Total BERD Expenditure
Manufacturing	238.0	69	7.8	2
Services & Other	86.2	25	12.0	3
All Industries <sup>12</sup>	324.2	94	19.8	6

As Table 7 shows, in-house R&D expenditure, i.e. spending carried out within the company, accounted for 94% (£324.2 million) of total expenditure in Northern Ireland in 2010, higher than the proportion in 2009 (92%) and 2008 (93%). The majority of in-house R&D expenditure was in the Manufacturing sector while the majority of purchased R&D expenditure was in the Services and other sector.

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 71% of in-house expenditure, lower than in 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 (71% of total in-house expenditure) compared to 32% in the Manufacturing Sector. Within capital expenditure Manufacturing had more expenditure in Land & Buildings than in Plant & Machinery while the reverse was true for Services and Other.

Salaries and Wages as a proportion of in-house expenditure have remained in the same proportions in 2010 as in 2009 in Manufacturing and in Services & Other.

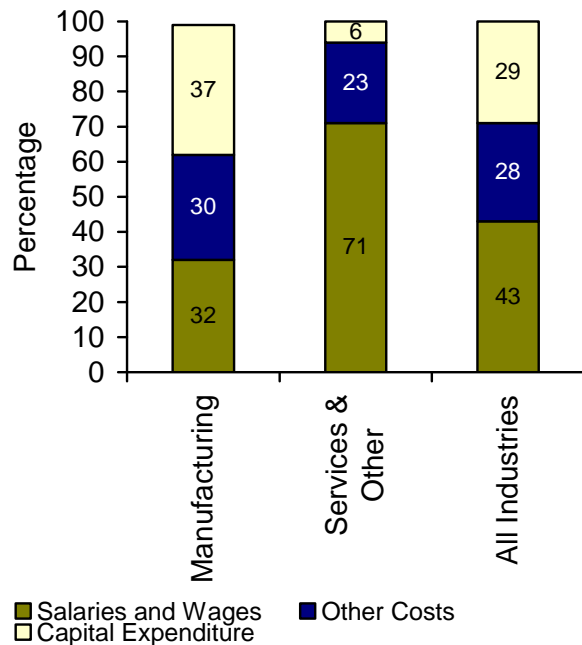
Over the year to 2010 the proportion spent on capital expenditure increased from 21% to 29%.

<sup>12</sup> 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) 2010**

	Manufacturing		Services & Other		All Industries	
	£m	%	£m	%	£m	%
<b>Non Capital Expenditure</b>						
Salaries & Wages	77.3	32	60.9	71	138.2	43
Other Costs	71.8	30	20.0	23	91.8	28
<b>Capital Expenditure</b>						
Land & Buildings	45.2	19	0.5	1	45.7	14
Plant & Machinery	43.7	18	4.8	6	48.5	15
<b>In-house Expenditure</b>	<b>238.0</b>	<b>100</b>	<b>86.2</b>	<b>100</b>	<b>324.2</b>	<b>100</b>

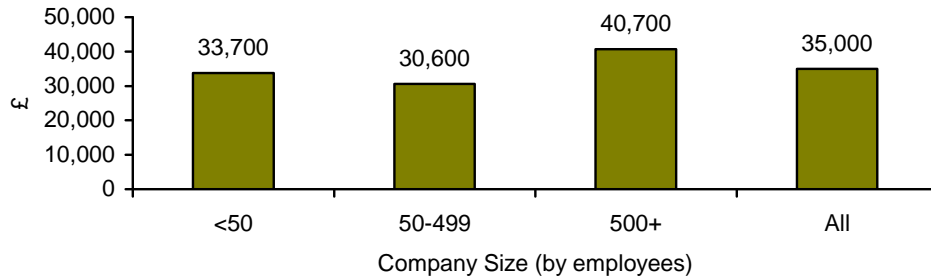
**Figure 7: Percentage of In-house R&D Expenditure by Sector 2010**



## 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) 2010**

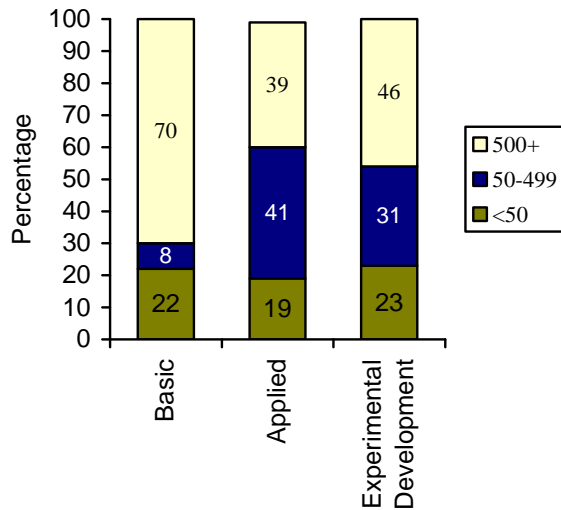


Overall the salaries and wages per R&D FTE was £35,000, a decrease of 1.7% from £35,600 in the previous year. Salaries and wages per head for companies with 500 or more employees were £40,700. This compares with £33,700 per head for companies with less than 50 employees and £30,600 per head for companies with between 50 and 499 employees.

**Table 9: Type of Research by Sector as percentage of All Research (Non Capital Expenditure) (percentages) 2010**

	Manufacturing %	Services and Other %	All Industries %
Basic	6	2	8
Applied	25	17	42
Experimental Development	33	17	50
All Research	65	35	100

**Figure 9: Type of Research by Company Size (percentage) 2010**



Non capital expenditure can also be analysed in terms of type of research carried out. Experimental development accounted for 50% of non capital expenditure in 2010, lower than that in 2009 (59%) and higher than in 2008 (46%), with applied research and basic research accounting for 42% and 8% respectively.

Figure 9 shows that the majority of spending on applied research and experimental development is carried out by companies with between 0 and 499 employees (60% and 54% respectively). 70% of spending on basic research is carried out by companies with 500 or more employees and companies with over 500 employees were dominant in terms of spend in basic research and experimental development in 2010. A detailed breakdown of the type of research carried out by both industry and company size is given in Annex Table 1.

## 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 2010**

	<50	50-499	500+	All
	%	%	%	%
Own Funds NI	54	48	70	61
Own Funds Parent	27	44	7	20
Government	17	8	22	18
Overseas	1	0	1	1
Other	2	0	0	0
Total	100	100	100	100

Table 10 shows that the greatest proportion of R&D funding was from Own Funds NI. 70% of R&D was funded by Own Funds NI in firms with over 500 employees compared to 54% and 48% 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 (27% and 44% respectively) than firms with 500 or more employees (7%). The proportion of funding for R&D from own funds, NI and parent, was 81% for firms with under 50 employees, 92% for firms with between 50 and 499 employees and 77% for firms with 500 or more employees.

Firms with 500 or more employees reported the greatest proportion of funds from Government at 22% of funding, with a lower proportion for firms with fewer than 50 employees (17%), while firms with between 50 and 499 employees received 8% 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%.

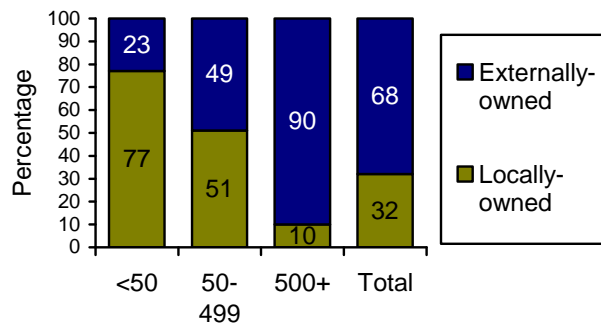
**Table 11: Breakdown of R&D expenditure by ownership of company 2010**

	£m	%	Number of companies	%
Locally-owned companies	109.9	32	370	87
Externally-owned companies	234.1	68	54	13
Total (All companies)	344.0	100	424	100

Expenditure by locally owned companies (£109.9m) has increased by 27% from £86.7m in 2009 while the number of these companies who reported R&D expenditure increased to 370.

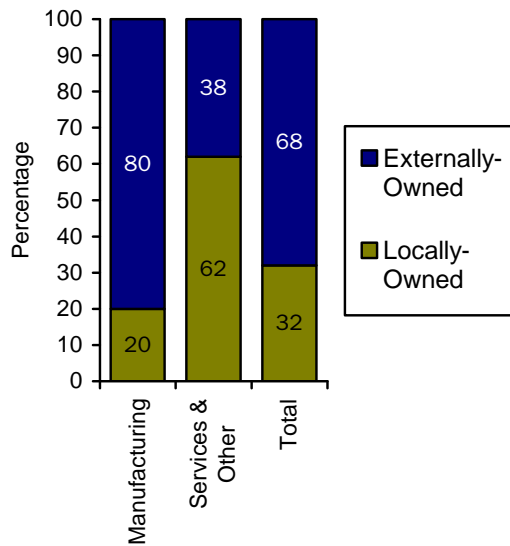
Northern Ireland owned companies in 2010 accounted for 87% of all R&D performing companies and 32% of the total £344.0m expenditure. This can be compared with externally-owned companies accounting for 68% of the R&D expenditure and 13% of R&D performing companies.

**Figure 10: Expenditure by ownership by company size (percentages) 2010**



The majority of R&D spend in companies with under 50 employees (77%) was by Northern Ireland owned firms. In companies with between 50 and 499 employees the larger proportion (51%) was also by locally owned firms. However, the analysis shows that in companies with 500 or more employees the majority of R&D expenditure (90%) was by externally-owned firms.

**Figure 11: Expenditure by ownership by sector (percentages) 2010**



Analysis of R&D spend split by ownership and sector showed that 80% of R&D spend in the Manufacturing sector was by externally-owned companies.

In the Services & Other sector, Northern Ireland owned companies accounted for 62% of R&D expenditure.

Compared to the previous year locally-owned companies increased their proportion of expenditure in both the Manufacturing (from 19% to 20%) and Services & Other sectors (from 46% to 62%).

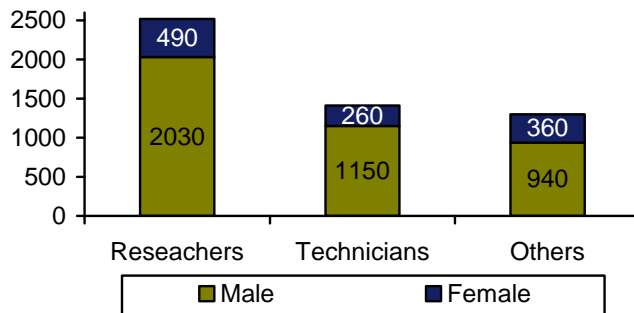


## BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – EMPLOYMENT ON R&D

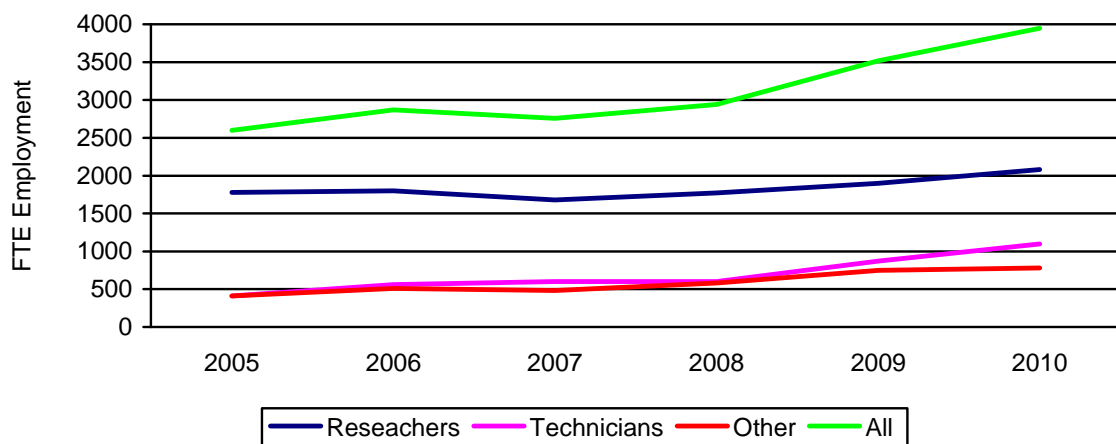
In 2010, companies surveyed reported a total of 5,230 employees working on R&D, approximately 11% of all employees in companies carrying out R&D which is higher than in 2009 (8%). Of these 5,230 employees involved in R&D activities, 4,120 were males and 1,120 were females. This compared to 4,690 employees in 2009 with 3,740 males and 950 females.

Approximately 79% of all R&D employees were male. By type of R&D employee, researchers accounted for 48%, technicians for 27% and other employees (e.g. support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects) for 25% of all R&D employees. Comparable full-time equivalent figures show that 2,080 employees were researchers (53%), 1,100 employees were technicians (28%) and the number of other employees was 780 (20%).

**Figure 12: Employment on R&D in 2010 by gender (Headcount)**



**Figure 13: Employment on R&D 2005-2010 (FTE)**



Since 2008, the number of technicians has grown faster than either researchers or other staff.

On a full-time equivalent basis there were 2,090 employees in Manufacturing and 1,870 in the Services & Other sectors. Within Manufacturing, researchers accounted for 58% of R&D employees with the level of technicians at 20% and other employees at 21%.

Within the Services & Other sectors, researchers made up 46% of R&D employees, technicians 36% and other employees 18%.

## 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 2010, following the introduction of the question in the 2004 survey.

80 R&D performing companies reported that they received tax credits amounting to £19.2million in total. This represents an increase in the number of R&D performing companies receiving tax credits and a decrease in the amount received when compared with last year.

**Table 12: Breakdown of R&D Tax Credits 2007-2010**

	2007	2008	2009	2010
Number of companies	52	57	77	80
Tax credit (£m)	26.3	9.5	21.7	19.2

## JOINT PROJECTS

46 companies reported that their R&D work was part of a joint project with a source outside their company. 11 companies had a joint project with Higher Education Establishments, 21 with other Businesses and 14 with both. This shows a decrease in the number of companies engaging in joint projects from last year (50 in total).

### 3: R&D Information from other sources

#### Business Expenditure on Research & Development in the Republic of Ireland

The Business Sector Research and Development Survey is jointly conducted biennially by Forfás and the Central Statistics Office (CSO). The most recent results relate to the research and development activities of enterprises in 2009 and 2010.

Research & development expenditure performed by the business sector in Ireland was almost €1.9 billion in 2009 with 83% of being spent on current (non capital) expenditure and 17% being spent on capital expenditure.

Research and development spending in 2009 was highest in the services sector which accounted for almost 60% of all expenditure. Spending in this sector was €1.1bn in 2009 while the manufacturing sector spent €743m on research and development. (It should be noted that spending in the services sector includes the spend from all other non-manufacturing sectors for reasons of confidentiality, however, the value of this contribution to the services sector is not significant). In both the services and manufacturing sectors, around four fifths of total research and development expenditure was accounted for by current (non capital) expenditure.

In excess of 80% of total R&D expenditure was concentrated in four sectors 'Manufacturing', 'Information and communication services', Real estate activities' combined with 'Professional, scientific and technical activities'.

Foreign owned enterprises spent over €1.3bn on research and development in 2009, (almost 70% of all R&D expenditure) while Irish owned enterprises spent €563m. Current expenditure accounted for 82% of all spending by foreign owned enterprises compared to 84% for Irish owned enterprises.

Small enterprises with less than fifty persons engaged accounted for €300m or 16% of the total spend on research and development in 2009. Medium/large enterprises spent €1.6bn or 84% of the total figure which includes €763m on labour costs.

There were 11,959 Full Time Equivalent (FTE) research and development staff in Ireland in 2009. There were 1,477 PhD qualified researchers, 6,256 other researchers and 4,227 technical and support staff. Irish owned enterprises employed 41% of all FTE research staff compared to 59% engaged by foreign owned enterprises. The Manufacturing sector employed 4,087 FTE's, while the Information and communication services sector employed the equivalent of 3,550 full time staff, and the Real estate; Professional, scientific and technical activities sector a further 2,373 FTE's.

Over 92% of all research and development expenditure was funded by enterprises' own company/internal funds, while over 4% of expenditure was funded from public funds. The remainder of the funding came from other sources such as higher education institutes, private non-profit institutes etc.

Enterprises were asked for their expected research and development expenditure in 2010. As the survey was conducted before many enterprises would have had final data for that year, the figures should be regarded as estimates. These estimates indicate that research and development expenditure would be in the region of €1.8bn.

# 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.

## **Definition of R&D**

The survey of Northern Ireland Business Expenditure on Research and Development during 2010 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 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 2010, although companies were given the option of supplying data for a business year ending on any date between 6 April 2010 and 5 April 2011.

## **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 2009 survey carried out by DETI) 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 2010 survey, businesses were stratified into 4 groups:

- (i) Businesses responding to the 2009 DETI 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 2010); 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 2010 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 2010, 1,141 forms were sent out to businesses believed to be performing R&D. Completed forms were returned by 1,021 businesses representing a response rate of 89 per cent. The total number of companies spending on R&D is relatively small – 424 in 2010 (and in 2009).

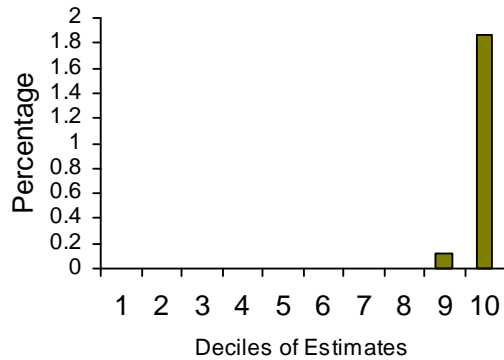
### **Survey Design – Validation and Estimation**

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 19% of the total non-respondent companies. The remaining 81% - 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 2.0% of total BERD spend for 2010 (compared to 1.1% in 2009). Estimates for Invest NI companies account for 0.8% of total BERD spend while estimates for non Invest NI companies account for 1.2% of total BERD spend. This should be borne in mind when considering the results.

Figure 14 shows that all estimates made up 2.0% of total 2010 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 99.8% 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 2010 BERD**



### **Status of Figures in Current Bulletin**

The results are provisional and may be revised should additional information become available. 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



# 5: Northern Ireland Higher Education Expenditure on Research & Development during 2010

Table 12 details the headline results from the 2008, 2009 and 2010 Higher Education Expenditure on Research & Development (HERD) surveys.

**Table 12: Higher Education Expenditure on R&D**

	2008	2009	2010
	£million	£million	£million
HERD Expenditure <sup>13</sup>	145.2	144.1	163.0
of which:			
Non Capital Expenditure	129.9	135.1	144.8
Capital Expenditure	15.3	9.0	18.3
Source of funding of R&D:			
Government Block Grant	74.5	75.7	81.3
OST Research Councils <sup>14</sup>	10.6	11.8	14.2
UK-based charities	7.6	8.9	9.5
UK Cent Gov/Local Auth/Health <sup>15</sup>	33.0	27.8	37.9
UK Ind/Comm/Pub Corp <sup>16</sup>	3.3	3.4	3.6
EU Government	6.8	6.0	7.2
EU Other	2.8	3.1	2.1
Other Overseas	3.8	4.5	4.9
Other Sources	2.8	2.9	2.2
	Number	Number	Number
HERD Employment <sup>17</sup>	1,600	1,700	1,690
of which:			
Academic staff	1,190	1,270	1,290
Technicians <sup>18</sup>	220	220	210
Other <sup>19</sup>	190	220	190

Total HERD expenditure increased by 13.1% from £144.1m in 2009 to £163.0m in 2010, compared with a decrease of 0.7% from 2008 to 2009. The increase in 2010 in-house expenditure was comprised of a 102.1% increase in capital expenditure and an increase of

<sup>13</sup>Expenditure for 2010 includes £1.2 million of expenditure funded by Northern Ireland businesses (£1.1m in 2009 and £1.0m in 2008). Therefore, net HERD in 2010 was £161.8m (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.

<sup>14</sup> Office of Science and Technology Research Councils

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

<sup>16</sup> Funding from UK industry/commerce/public corporations

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

<sup>18</sup> Technicians – Perform scientific and technical tasks normally under the supervision of researchers.

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

7.1% in non capital expenditure. This compares to the previous period where capital expenditure decreased by 40.9% and non capital expenditure increased by 4.0%.

Employment totals decreased between 2009 and 2010, from 1,700 full-time equivalent persons in 2009 to 1,690 in 2010. The change in R&D employment consisted of an increase in the number of academic staff (from 1,270 to 1,290), a decrease in the number of technicians (from 220 to 210) and a decrease in the number of other employees employed in R&D (from 220 to 190).

Block grants remained the largest source of funds with their relative contribution decreasing from 52.5% in 2009 to 49.9% in 2010. Funding from UK Central Government/Local Authorities and Health Trusts/Hospitals increased by 36% from £27.8m in 2009 to £37.9m in 2010, accounting for 23.2% of HERD funding in 2010 compared to 19.3% in 2009.

Table 12 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. 2009/2010 ending 31/7/2010. 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.

A Steering Group was set up to implement the policy and their advice was referred to Government in the Transparency Review Report. This was endorsed in June 1999 and is now required policy for the sector. All institutions had to report transparently on the costs of their Teaching, Research, and other activities for 1999/2000 in July 2001 and each year thereafter. As a consequence, accurate and comparable R&D data for each university can now be obtained and this is presented in Table 12.

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](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 12. 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 2010 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	
<b>Manufacturing</b>										
<50	7,900	5,200	13,100	800	5,900	6,500	*	*	700	13,800
50- 249	13,900	15,300	29,200	*	*	16,300	*	*	3,200	32,400
250+	55,400	51,300	106,700	*	*	54,000	*	*	85,100	191,800
Total	77,300	71,800	149,100	14,800	57,500	76,800	45,200	43,700	88,900	238,000
<b>Services &amp; Other</b>										
<50	27,400	8,900	36,300	3,300	13,000	20,000	*	*	1,400	37,700
50 -249	23,800	10,400	34,200	*	*	11,400	*	*	1,500	35,700
250+	9,700	700	10,400	*	*	6,600	*	*	2,400	12,800
Total	60,900	20,000	80,900	3,600	39,200	38,100	500	4,800	5,300	86,200
<b>All Industries</b>										
<50	35,300	14,100	49,400	4,100	18,800	26,500	100	2,000	2,100	51,500
50-249	37,700	25,800	63,400	1,000	34,700	27,800	800	3,900	4,700	68,100
250+	65,200	51,900	117,100	13,400	43,200	60,600	44,800	42,600	87,400	204,500
Total	138,200	91,800	230,000	18,400	96,700	114,900	45,700	48,500	94,200	324,200

\*Disclosive

Totals may not sum due to rounding

**Table 2: Breakdown of Purchased R&D Expenditure 2010 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
<b>Manufacturing</b>					
	<50	900	300	600	1,700
	50-249	*	*	*	400
	250+	*	*	*	5,700
	Total	4,400	2,300	1,100	7,800
<b>Services &amp; Other</b>					
	<50	3,200	1,200	1,100	5,400
	50-249	*	*	*	6,200
	250+	*	*	*	400
	Total	3,800	1,300	6,900	12,000
<b>All Industries</b>					
	<50	4,100	1,400	1,600	7,200
	50-249	300	300	5,900	6,600
	250+	3,800	1,800	500	6,100
	Total	8,200	3,600	8,000	19,800

\*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) 2001-2010 (£m)<sup>20</sup>**

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

Totals may not sum due to rounding

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

**Table 4: Breakdown of 2010 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
<b>Manufacturing</b>																	
Employment Size-bands	<50	*	*	200	120	*	*	120	70	120	30	140	60	420	50	470	250
	50-249	*	*	200	150	*	*	130	90	*	*	340	*	550	120	670	480
	250+	890	230	1,120	950	330	70	400	270	*	*	360	*	1,450	430	1,880	1,350
	Total	1,220	300	1,520	1,210	550	100	650	430	640	210	850	450	2,420	600	3,020	2,090
<b>Services &amp; Other</b>																	
Employment Size-bands	<50	*	*	490	410	*	*	250	180	150	80	230	200	760	220	970	800
	50-249	*	*	270	220	*	*	230	200	*	*	140	*	470	180	640	540
	250+	*	*	240	230	220	60	280	280	*	*	80	*	480	120	600	520
	Total	810	190	1,000	870	600	170	760	670	300	160	450	330	1,700	510	2,210	1,870
<b>All Industries</b>																	
Employment Size-bands	<50	590	110	700	530	320	50	370	250	270	110	380	270	1,180	260	1,440	1,050
	50-249	360	100	460	370	280	80	370	290	370	120	490	360	1,010	300	1,320	1,030
	250+	1,080	280	1,360	1,170	550	130	680	550	300	140	440	150	1,930	550	2,480	1,880
	Total	2,030	490	2,520	2,080	1,150	260	1,410	1,100	940	360	1,300	780	4,120	1,120	5,230	3,950

\*Disclosive

Totals may not sum due to rounding

## **Next Publication**

The next bulletin will be published in late 2012.

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