



Department of
**Finance and
Personnel**
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Business Activity

Statistics Bulletin

Northern Ireland Research & Development Statistics 2011

14 December 2012



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National Statistics

The Northern Ireland Research and Development Statistics 2011 is a National Statistic which is currently undergoing assessment 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. 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 990 returns were received by the Department – some 87% 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 5% of the value of total Business Expenditure on R&D (BERD) for 2011. 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 2001-2011 (£million)

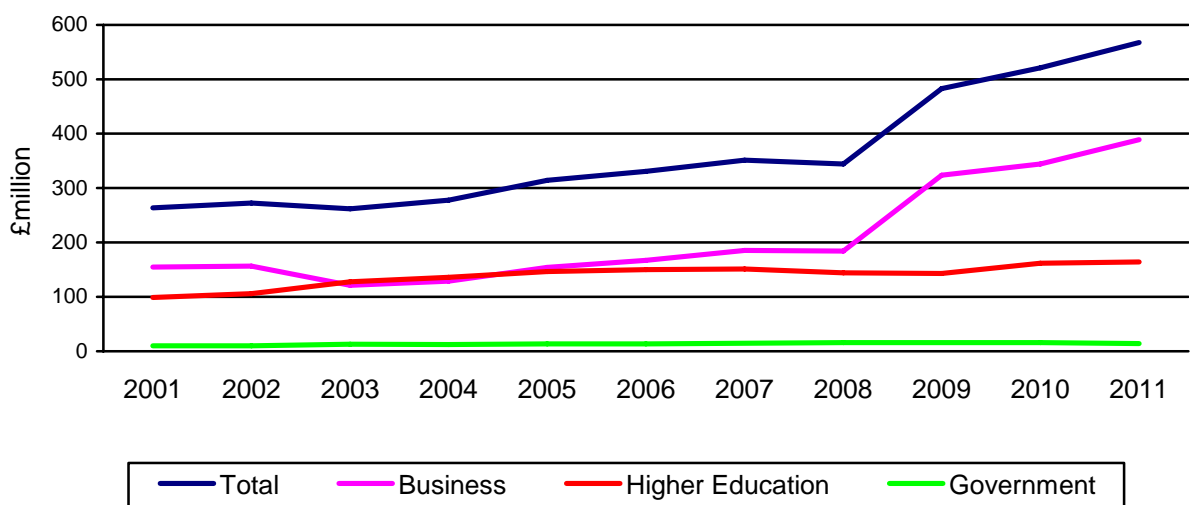


Table 1: Total Expenditure on R&D in Cash Terms 2001-2011 (£million)

	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

Total Expenditure on R&D in Cash Terms

Total expenditure on Research and Development in Northern Ireland (NI) in cash terms was £567.5 million (m) in 2011, of which £388.8m (69%) was spent by businesses, £164.3m (29%) by the Higher Education sector and the remainder, £14.4m (3%) was Government expenditure.

There was an increase of £46.1m (9%) in cash terms in NI total R&D expenditure between 2010 and 2011 to £567.5m. This increase was comprised of rises in Business R&D expenditure of £44.8m (13%) and in Higher Education expenditure of £2.5m (2%) and a decrease in Government expenditure of £1.2m (-8%). Over the last five years total R&D spending in cash terms in NI has risen by 72% and by 115% since 2001.

Historical Expenditure (Real terms)

Figure 2: Expenditure on R&D in Real Terms 2001-2011 (£million)¹

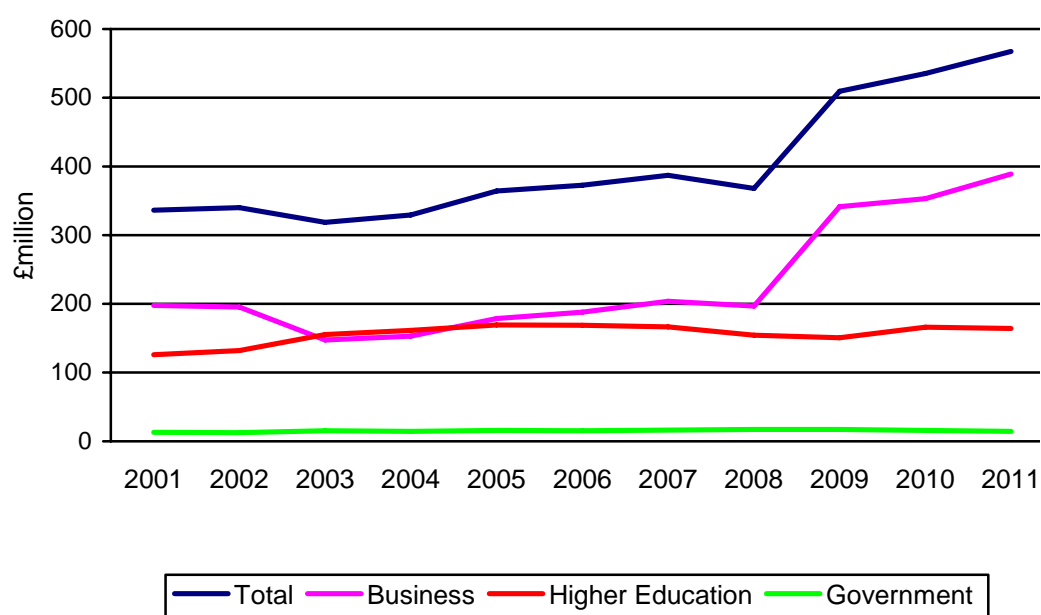


Table 2: Total Expenditure on R&D in Real Terms 2001-2011 (£million)

	Business	Higher Education	Government	Total
2001	197.7	126.0	12.8	336.5
2002	195.3	131.9	12.6	339.8
2003	147.6	155.5	15.5	318.6
2004	153.1	161.5	14.6	329.1
2005	178.8	169.4	15.8	364.0
2006	188.0	169.0	15.4	372.4
2007	203.9	166.7	16.2	386.8
2008	196.6	154.2	17.0	367.8
2009	341.6	150.9	17.0	509.5
2010	353.2	166.1	16.0	535.4
2011	388.8	164.3	14.4	567.5

¹ GDP deflator used to convert cash terms to real terms: e.g. 2005 (86.3), 2006 (88.8), 2007 (90.8), 2008 (93.5), 2009 (94.8), 2010 (97.4), 2011=100

Total Expenditure on R&D in Real Terms

In real terms, total expenditure increased by £32.1m or 6% from £535.4m in 2010 to £567.5m in 2011.

In 2011 the NI Business sector again accounted for a greater share of total R&D expenditure (69%) than the Higher Education sector (29%). In 2010 the figures were 66% and 31% respectively.

Over the last five years (2006-2011) total R&D spending in real terms in NI has risen by 52% and by 69% since 2001.

Over the year to 2011 there was an increase in expenditure by Businesses while decreases occurred in Higher Education and Government expenditure. In real terms, expenditure by Businesses increased by £35.6m (10%), Higher Education decreased by £1.8m (-1%) and Government expenditure decreased by £1.6m (-10%) in real terms over the year.

Business R&D expenditure rose by 107% between 2006 and 2011 in real terms and by 97% between 2001 and 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

NI business R&D expenditure carried out within a company in NI (in-house), accounted for 91% (£354.1m) of total business expenditure in 2011. In-house expenditure increased by 9% between 2010 and 2011.

Business R&D: Sectoral Analysis

In 2011, the majority of R&D was carried out within the Manufacturing sector (79%) with the remainder (21%) carried out in the Services & Other sector. The share of expenditure in the Manufacturing sector compared to the previous year has increased by 11%.

Over the year to 2011, an increase in expenditure occurred in the Manufacturing sector and a decrease occurred in the Services & Other sector. The increase in expenditure in the Manufacturing sector, (£61.6m or 25%) was bigger in value and proportional terms than the decrease of £16.8m (-17%) 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 64% of business R&D expenditure in 2011, although they represented only 11% of R&D performing companies. Small firms (i.e. those with less than 50 employees) represented some 67% of R&D performing companies and accounted for 15% of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)* accounted for 36% of the total business expenditure. Total SME expenditure increased by £7.2m (5%) from 2010 to 2011, in cash terms. However, since 2006 SME expenditure has increased by 72% to £140.6m. The proportion that large companies

(250+ employees) make to total R&D expenditure (64%) was more than in the previous two years (2010: 61%; 2009: 55%).

*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 15% from Government, 2% from overseas and other sources. The proportion of funding from own funds increased marginally from 81% in 2010 to 83% in 2011.

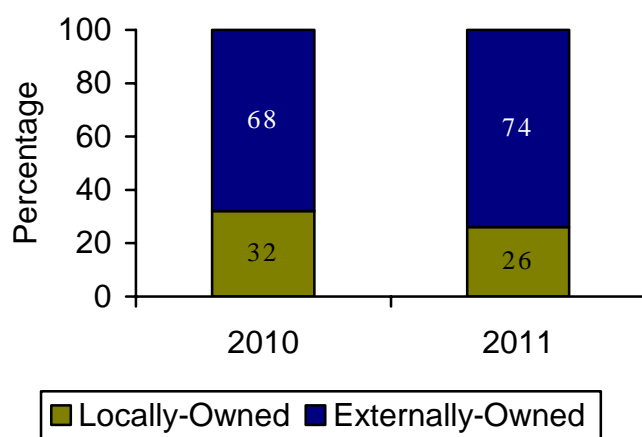
Business R&D: Ownership

Companies with ownership outside NI play an important role in financing R&D activities in the region. Almost three quarters, £287.7m (74%) of total R&D spend was by such externally-owned companies although they accounted for 14% of all R&D performing companies. Their contribution to the total R&D spend was higher than in 2010 (68%) and their cash value increased by £53.6m over the same period.

R&D expenditure by locally-owned companies decreased by 8% (-£8.8m) between 2010 and 2011 while R&D Expenditure by externally-owned companies increased by 23% (£53.6m).

The majority of R&D expenditure in Manufacturing is carried out by externally-owned companies (82%), compared with the Services & Other sector (43%).

Figure 3: Expenditure by Ownership 2010-2011 (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 2011, companies surveyed reported a total of 5,440 employees working on R&D, some 10% of all employees in companies carrying out R&D. The full time equivalent figure (FTE) for 2011 was 4,240.

The number of R&D employees increased by 4% over the year to 2011. The FTE rise from 2010 to 2011 was 7%.

Table 3: R&D Employment 2005-2011

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

Higher Education R&D

R&D expenditure in the Higher Education sector increased by 1.6% in cash terms between 2010 and 2011 (from £163.0m to £165.6m). Net expenditure in 2011 (excluding spend by businesses undertaken by higher education) was £164.3m.

Half of funding (51%) for Higher Education R&D in 2011 came from the Government block grant (£84.4m). In 2011, there were some 1,550 full-time equivalent employees in the Higher Education sector engaged in R&D, decreasing from 1,690 employees in 2010.

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% (£354.1m) of total business expenditure in 2011.

Of the 12 UK regions, nine showed an increase in in-house business R&D expenditure in cash terms over the year to 2011, including NI which increased by 9.2%. This was the sixth highest percentage increase across the UK regions. In the UK as a whole such expenditure increased by 8.4%. Changes varied from an increase of 39.6% in the West Midlands to a decrease of 15.9% in the North East.

Over the two year period 2009 to 2011, in-house business R&D expenditure in cash terms in NI increased by 19.2%. In the UK as a whole such expenditure rose by 12.1%.

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 (2010-2011)
	2011	2010	
UK	17,408	16,053	8.4%
England	16,113	14,873	8.3%
North East	259	308	-15.9%
North West	2,260	2,074	9.0%
Yorkshire & The Humber	543	488	11.3%
East Midlands	1,149	1,137	1.1%
West Midlands	1,237	886	39.6%
South West	1,358	1,454	-6.6%
East of England	3,638	3,851	-5.5%
London	1,142	877	30.2%
South East	4,528	3,798	19.2%
Wales	255	234	9.0%
Scotland	689	622	10.8%
Northern Ireland	354	324	9.2%

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 2011 released by the Office for National Statistics (ONS) on the 12th December 2012 shows that Northern Ireland 2011 in-house R&D as a proportion of GVA was 1.2% and was the seventh highest of the twelve UK regions (a lower proportion was recorded in North East (0.6%), Scotland (0.6%), Yorkshire & The Humber (0.6%) Wales (0.5%) and London (0.4%)). Northern Ireland in-house R&D as a proportion of GVA is the slightly lower than the UK average rate (1.3%). 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 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 2006 and 2011 total business expenditure on R&D increased by 107% in real terms, with in-house R&D increasing by 101% and purchased R&D expenditure increasing by 196%. Government funding decreased by 5% over the year, business expenditure from own funds increased by 11% and other sources of funding increased by 107%.

The ten biggest R&D spenders in 2011 accounted for 62% of total expenditure which is greater than the proportion in 2010 (59%). 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 – 59% in 2010, 57% in 2009, 41% in 2008, 49% in 2007, and 44% in 2006.

In Cash Terms

In 2011, 50 companies spent more than £1 million on R&D, six more companies than in 2010, three more than in 2009, and nine more than the number in 2008. Average in-house R&D

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>

expenditure was £83,448 per R&D employee in 2011, 2% higher than the figure of £82,032 per R&D employee in 2010, (employees are on a Full-Time Equivalent basis).

In 2011, 4,240 employees (on a Full-time Equivalent (FTE) basis) were engaged in R&D work – 7.7% of all employees of companies involved in R&D. Comparable figures for 2010 were 3,950 employees or 8.2% of all employees of R&D companies (2009: 5.8%, 2008: 5.7% and 2007: 5.7%).

Table 5: Business Expenditure on R&D 2006 – 2011

	Cash Terms						Real Terms (2011 Prices) ³						% Change Real Terms	
	2006	2007	2008	2009	2010	2011	2006	2007	2008	2009	2010	2011	10-11	06-11
Total Business Expenditure (£m)	167.0	185.1	183.9	323.7	344.0	388.8	188.0	203.9	196.6	341.6	353.2	388.8	10.1%	106.8%
In-house R&D (£m)	156.6	176.9	170.6	297.2	324.2	354.1	176.3	194.9	182.4	313.6	332.9	354.1	6.4%	100.8%
Non capital (£m)	142.5	165.3	152.2	235.0	230.0	321.2	160.5	182.1	162.7	248.0	236.2	321.2	36.0%	100.2%
Capital (£m)	14.1	11.6	18.4	62.2	94.2	32.8	15.9	12.8	19.7	65.6	96.7	32.8	-66.1%	106.6%
Purchased R&D (£m)	10.4	8.2	13.3	26.5	19.8	34.7	11.7	9.0	14.2	28.0	20.3	34.7	70.7%	196.3%
In-house R&D Funding⁴														
R&D Funded from own funds (£m)	127.5	139.6	145.8	242.5	264.0	294.1	143.6	153.8	155.9	255.9	271.1	294.1	8.5%	104.9%
R&D Funded by Government (£m)	24.2	20.6	22.7	50.4	57.3	54.2	27.2	22.7	24.3	53.2	58.8	54.2	-7.9%	98.9%
R&D (£m) Other	15.2	16.8	2.1	4.3	2.8	5.8	17.1	18.5	2.2	4.5	2.9	5.8	101.7%	-66.1%

³ GDP deflator used to convert cash terms to real terms: 2006 (88.8), 2007 (90.8), 2008 (93.5), 2009 (94.8), 2010 (97.4), 2011=100

⁴ R&D Funding sums to Total BERD for 2006

Table 5 continued: Business Expenditure on R&D 2006 – 2011

	Cash Terms						Real Terms (2011 Prices) ⁵						% Change Real Terms	
	2006	2007	2008	2009	2010	2011	2006	2007	2008	2009	2010	2011	10-11	06-11
Ownership														
External Ownership (%)	53	57	60	73	68	74	53	57	60	73	68	74	8.8%	39.6%
Local Ownership (%)	47	43	40	27	32	26	47	43	40	27	32	26	-18.8%	-44.7%
Type of In-house Non capital Research														
Basic Research (£m)	8.1	15.8	8.0	13.5	18.4	7.3	9.1	17.4	8.6	14.2	18.9	7.3	-61.4%	-20.0%
Applied Research (£m)	67.0	81.3	74.1	83.9	96.7	114	75.4	89.6	79.2	88.5	99.3	114.0	14.8%	51.1%
Experimental Development (£m)	67.4	68.2	70.1	137.7	114.9	200	75.9	75.1	74.9	145.3	118.0	200.0	69.5%	163.5%
Size														
SME ⁶ (£m)	81.6	117.2	106.1	144.3	133.4	140.6	91.9	129.1	113.4	152.3	137.0	140.6	2.6%	53.0%
250+ (£m)	85.4	67.9	77.8	179.4	210.6	248.1	96.2	74.8	83.2	189.3	216.3	248.1	14.7%	158.0%

⁵ GDP deflator used to convert cash terms to real terms: 2006 (88.8), 2007 (90.8), 2008 (93.5), 2009 (94.8), 2010 (97.4), 2011=100

⁶ 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 2006 – 2011

	Cash Terms						Real Terms (2011 Prices) ⁷						% Change Real Terms	
	2006	2007	2008	2009	2010	2011	2006	2007	2008	2009	2010	2011	10-11	06-11
Sector⁸														
Manufacturing (%)	63	56	62	71	71	79	63	56	62	71	71	79	11.3%	25.4%
Services and Other (%)	37	44	38	29	29	21	37	44	38	29	29	21	-27.6%	-43.2%

⁷ GDP deflator used to convert cash terms to real terms: 2006 (88.8), 2007 (90.8), 2008 (93.5), 2009 (94.8), 2010 (97.4), 2011=100

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

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT IN 2011

Table 6 details the headline results from the 2011 Business Expenditure on Research & Development (BERD) survey. The table shows that in 2011, total expenditure (in cash terms) on R&D by NI businesses was an estimated £388.8 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 (£354.1m or 91%) with £34.7m or 9% being purchased R&D expenditure which increased from £19.8m in the previous year. Of this £34.7m of purchased R&D expenditure in NI, some £1.3m was undertaken by the Higher Education sector.

83% of funding for in-house R&D in 2011 came from the companies' own resources (£294.1m) while government provided a further 15% (or £54.2m) and the remainder came from overseas and other sources (2% or £5.8m).

Table 6: Business Expenditure on R&D – 2011

	Total Expenditure by Business (£million)	As % of Total Expenditure
Total Expenditure	388.8	100
In-house R&D Expenditure ⁹	354.1	91
of which:		
Non Capital Expenditure	321.2	83
Capital Expenditure	32.8	8
Purchased R&D Expenditure ¹⁰	34.7	9
Of which:		
Undertaken by Higher Education	1.3	0.3

Total employment on R&D in businesses for 2011 was 4,240 (based on full time equivalent figures), which was higher than that in 2010 (3,950) and 2009 (3,520).

^{9,10} For definitions see Section 4, Background Notes.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SECTORAL BREAKDOWNS

In 2011, the majority of R&D was carried out within the Manufacturing sector (79%) with the remaining 21% carried out in the Services & Other industries category. The proportion carried out by Services & Other industries in 2011 (21%), 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 steadily increasing from 29% in 2003, to 44% in 2007.

The manufacture of transport equipment sub-section (CL) accounted for 47% of all Manufacturing R&D (see Figure 4) with the manufacture of computer, electronic and optical products (CI) accounting for 20%.

Figure 4: Percentage of Manufacturing R&D Expenditure in 2011 by Sub-section (SIC 2007 basis)¹¹

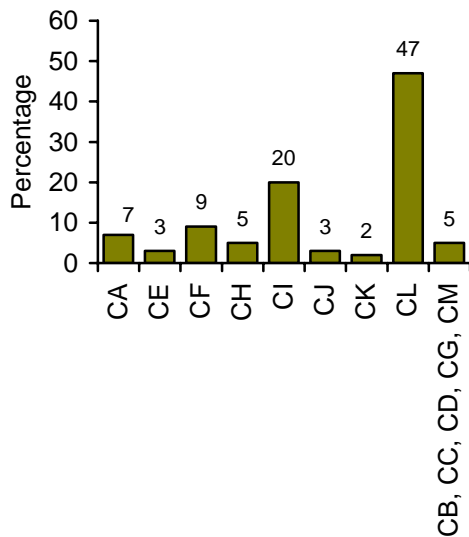
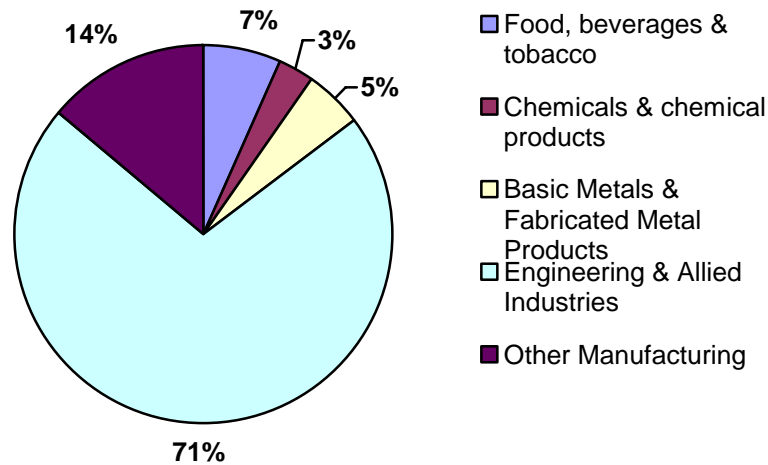


Figure 5 below, highlights that 71% of R&D spending within the Manufacturing sector was accounted for by companies involved in Engineering & Allied Industries (CI, CJ, CK, CL).

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

Figure 5: Percentage of Manufacturing Expenditure by SIC 2007 Subsection¹⁰ 2011



Companies with 250 or more employees accounted for 64% of business R&D expenditure in 2011, although they represented only 11% of R&D performing companies. Small firms (i.e. those with less than 50 employees) represented some 67% of R&D performing companies and accounted for 15% of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)* accounted for 36% of the total business expenditure. Total SME expenditure increased by £7.2m (5%) from 2010 to 2011, in cash terms; and since 2006, SME expenditure has increased by 72% to £140.6m. The proportion that large companies (250+ employees) make to total R&D expenditure (64%) was more than in the previous years (2010: 61%, 2009: 55%, 2008: 42%, 2007: 37%).. See Annex 1 Table 3 for further details.

Figure 6: Percentage of Total BERD Expenditure in 2011 by Company Size

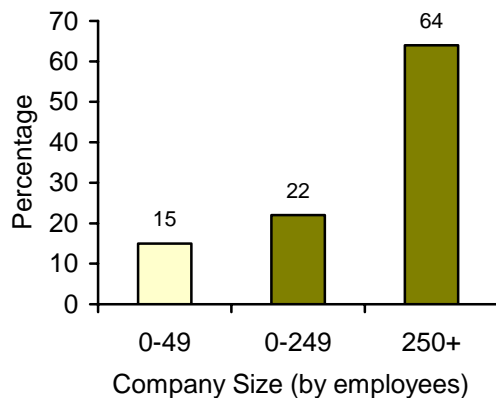


Table 7: In-house and Purchased R&D Expenditure by Sector 2011

	IN-HOUSE		PURCHASED	
	£m	% of Total BERD Expenditure	£m	% of Total BERD Expenditure
Manufacturing	280.4	72	27.0	7
Services & Other	73.7	19	7.7	2
All Industries ¹²	354.1	91	34.7	9

As Table 7 shows, in-house R&D expenditure, i.e. spending carried out within the company, accounted for 91% (£354.1 million) of total expenditure in NI in 2011, lower than the proportion in 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 91% of in-house expenditure, higher than in 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 (70% of total in-house expenditure) compared to 36% 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 £77.3m (32%) in 2010 to £100.2m (36%) in 2011 while the Services & Other sector decreased from £60.9m (71%) in 2010 to £51.8m (70%) in 2011.

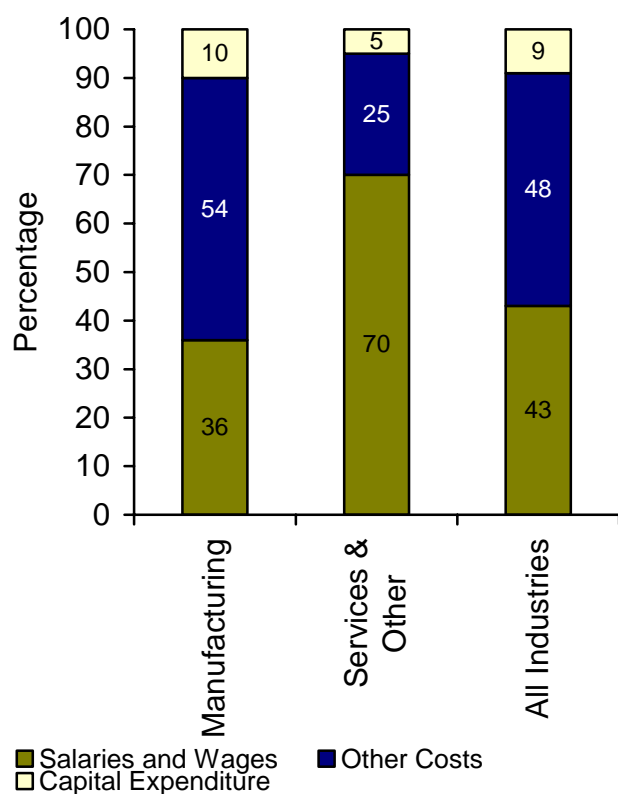
Over the year to 2011 the proportion spent on capital expenditure decreased from 29% to 9%.

¹² 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) 2011

	Manufacturing		Services & Other		All Industries	
	£m	%	£m	%	£m	%
Non Capital Expenditure						
Salaries & Wages	100.2	36	51.8	70	152	43
Other Costs	151.1	54	18.1	25	169.2	48
Capital Expenditure						
Land & Buildings	2.7	1	0.4	1	3.2	1
Plant & Machinery	26.4	9	3.3	4	29.7	8
In-house Expenditure	280.4	100	73.7	100	354.1	100

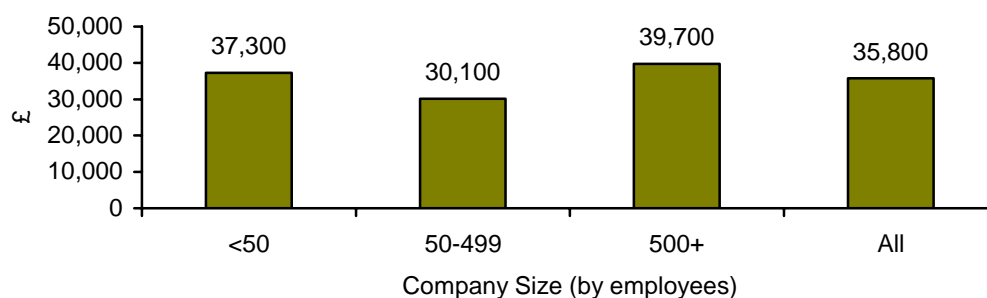
Figure 7: Percentage of In-house R&D Expenditure by Sector 2011



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) 2011



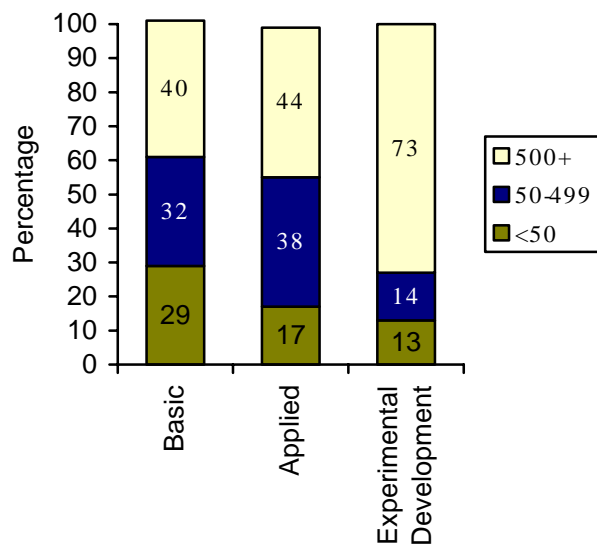
Overall the salaries and wages per R&D FTE was £35,800, an increase of 2.3% from £35,000 in the previous year. Salaries and wages per head for companies with 500 or more employees were £39,700. This compares with £37,300 per head for companies with less than 50 employees and £30,100 per head for companies with between 50 and 499 employees.

Table 9: Type of Research by Sector as percentage of All Research (Non Capital Expenditure) (percentages) 2011¹³

	Manufacturing %	Services and Other %	All Industries %
Basic	2	1	2
Applied	26	10	35
Experimental Development	51	11	62
All Research	78	22	100

¹³ For definitions see Section 4, Background Notes - Definition of Terms.

Figure 9: Type of Research by Company Size (percentage) 2011



Non capital expenditure can also be analysed in terms of type of research carried out. Experimental development accounted for 62% of non capital expenditure in 2011, higher than that in 2010 (50%), 2009 (59%) and 2008 (46%), with applied research and basic research accounting for 35% and 2% 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 (56% and 60% respectively). 73% of spending on experimental 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 2011. 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 2011

	<50	50-499	500+	All
	%	%	%	%
Own Funds NI	49	52	72	64
Own Funds Parent	28	40	9	19
Government	16	7	18	15
Overseas	6	1	1	1
Other	1	0	0	0
Total	100	100	100	100

Table 10 shows that the greatest proportion of R&D funding was from Own Funds NI. 72% of R&D was funded by Own Funds NI in firms with over 500 employees compared to 49% and 52% 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 (28% and 40% respectively) than firms with 500 or more employees (9%). The proportion of funding for R&D from own funds, NI and parent, was 77% for firms with under 50 employees, 92% for firms with between 50 and 499 employees and 81% for firms with 500 or more employees.

Firms with 500 or more employees reported the greatest proportion of funds from Government at 18% of funding, with a lower proportion for firms with fewer than 50 employees (16%), while firms with between 50 and 499 employees received 7% 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%.

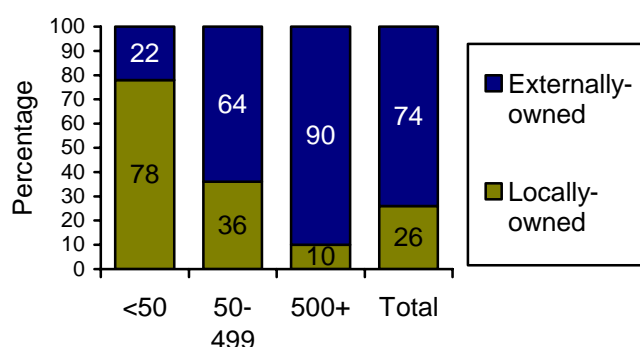
Table 11: Breakdown of R&D expenditure by ownership of company 2011

	£m	%	Number of companies	%
Locally-owned companies	101.1	26	369	86
Externally-owned companies	287.7	74	61	14
Total (All companies)	388.8	100	430	100

Expenditure by locally owned companies (£101.1m) has decreased by 8% from £109.9m in 2010 while the number of these companies who reported R&D expenditure decreased to 369.

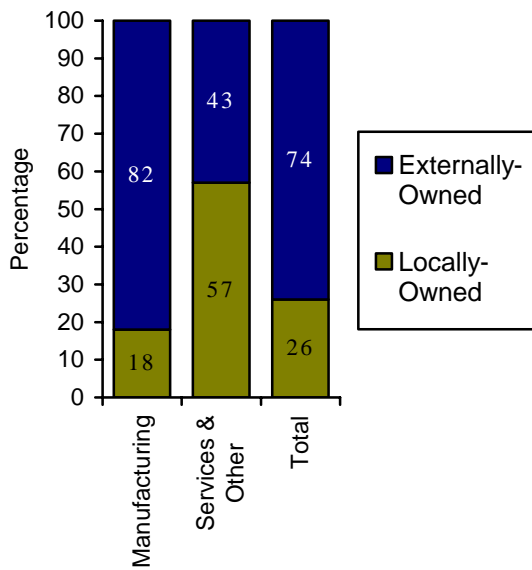
NI owned companies in 2011 accounted for 86% of all R&D performing companies and 26% of the total £388.8m expenditure. This can be compared with externally-owned companies accounting for 74% of the R&D expenditure and 14% of R&D performing companies.

Figure 10: Expenditure by ownership by company size (percentages) 2011



The majority of R&D spend in companies with under 50 employees (78%) was by NI owned firms. In companies with between 50 and 499 employees the larger proportion (64%) was also by externally 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) 2011



Analysis of R&D spend split by ownership and sector showed that 82% of R&D spend in the Manufacturing sector was by externally-owned companies.

In the Services & Other sector, NI owned companies accounted for 57% of R&D expenditure.

Compared to the previous year locally-owned companies decreased their proportion of expenditure in both the Manufacturing (from 20% to 18%) and Services & Other sectors (from 62% to 57%).

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

In 2011, companies surveyed reported a total of 5,440 employees working on R&D, approximately 10% of all employees in companies carrying out R&D which is lower than in 2010 (11%). Of these 5,440 employees involved in R&D activities, 4,310 (79%) were males and 1,130 (21%) were females. This compared to 5,230 employees in 2010 with 4,120 males and 1,120 females, again representing 79% and 21% respectively.

By type of R&D employee, researchers accounted for 50%, 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 23% of all R&D employees. Comparable full-time equivalent figures show that 2,360 employees were researchers (56%), 1,160 employees were technicians (27%) and the number of other employees was 720 (17%).

Figure 12: Employment on R&D in 2011 by gender (Headcount)

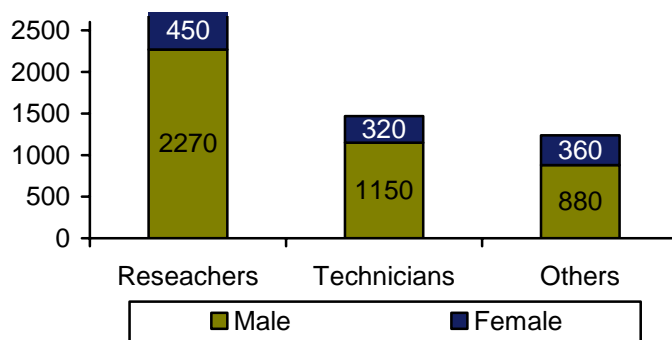
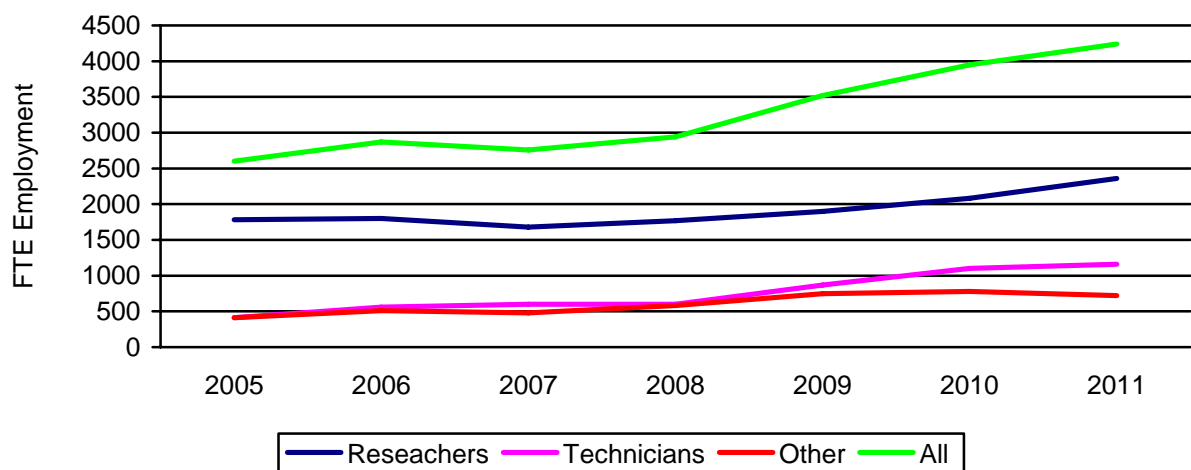


Figure 13: Employment on R&D 2005-2011 (FTE)



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

On a full-time equivalent basis there were 2,710 employees in Manufacturing and 1,530 in the Services & Other sectors. Within Manufacturing, researchers accounted for 59% of R&D employees with the level of technicians at 20% and other employees at 21%.

Within the Services & Other sectors, researchers made up 49% of R&D employees, technicians 41% and other employees 10%.

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 2011, following the introduction of the question in the 2004 survey.

136 R&D performing companies reported that they received tax credits amounting to £35.3million 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 2007-2011

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

JOINT PROJECTS

46 companies reported that their R&D work was part of a joint project with a source outside their company. 14 companies had a joint project with Higher Education Establishments, 22 with other Businesses and 10 with both. This shows the same number of companies engaging in joint projects as last year.

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 R&D 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.

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 2011 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 2011, although companies were given the option of supplying data for a business year ending on any date between 6 April 2011 and 5 April 2012.

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 2011 survey, businesses were stratified into 4 groups:

- (i) Businesses responding to the 2010 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 2011 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 2011, 1,138 forms were sent out to businesses believed to be performing R&D. Completed forms were returned by 990 businesses representing a response rate of 87 per cent. The total number of companies spending on R&D is relatively small – 430 in 2011 (and 424 in 2010).

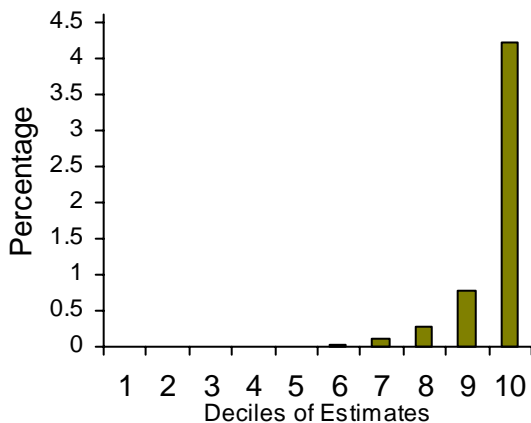
Survey Design – Validation and Estimation

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 57% of the total non-respondent companies. The remaining 43% - 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 5.4% of total BERD spend for 2011 (compared to 2.0% in 2010). Estimates for Invest NI companies account for 3.5% of total BERD spend while estimates for non Invest NI companies account for 1.8% of total BERD spend. This should be borne in mind when considering the results.

Figure 14 shows that all estimates made up 5.4% of total 2011 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 92.8% 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 2011 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 2011

Table 13 details the headline results from the 2009, 2010 and 2011 Higher Education Expenditure on Research & Development (HERD) surveys.

Table 13: Higher Education Expenditure on R&D

	2009	2010	2011
	£million	£million	£million
HERD Expenditure ¹⁴	144.1	163.0	165.6
of which:			
Non Capital Expenditure	135.1	144.8	148.4
Capital Expenditure	9.0	18.3	17.2
Source of funding of R&D:			
Government Block Grant	75.7	81.3	84.4
OST Research Councils ¹⁵	11.8	14.2	13.1
UK-based charities	8.9	9.5	9.3
UK Cent Gov/Local Auth/Health ¹⁶	27.8	37.9	39.7
UK Ind/Comm/Pub Corp ¹⁷	3.4	3.6	4.5
EU Government	6.0	7.2	8.1
EU Other	3.1	2.1	2.2
Other Overseas	4.5	4.9	3.0
Other Sources	2.9	2.2	1.4
	Number	Number	Number
HERD Employment ¹⁸	1,700	1,690	1,550
of which:			
Academic staff	1,270	1,290	1,180
Technicians ¹⁹	220	210	200
Other ²⁰	220	190	170

Total HERD expenditure increased by 1.6% from £163.0m in 2010 to £165.6m in 2011, compared with an increase of 13.1% from 2009 to 2010. The increase in 2011 in-house expenditure was comprised of a 6% decrease in capital expenditure and an increase of 2.5% in

¹⁴Expenditure for 2011 includes £1.3 million of expenditure funded by Northern Ireland businesses (£1.2m in 2010 and £1.1m in 2009). 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.

¹⁵ Office of Science and Technology Research Councils

¹⁶ Funding from UK Central Government, Local Authorities and Health Trusts/Hospitals

¹⁷ Funding from UK industry/commerce/public corporations

¹⁸ This is the number of full-time equivalents. Figures are rounded to the nearest 10 and constituent parts may not add due to rounding

¹⁹ Technicians – Perform scientific and technical tasks normally under the supervision of researchers.

²⁰ 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 increased by 102.1% and non capital expenditure increased by 7.1%.

Employment totals decreased between 2010 and 2011, from 1,690 full-time equivalent persons in 2010 to 1,550 in 2011. The change in R&D employment consisted of a decrease in the number of academic staff (from 1,290 to 1,180), a decrease in the number of technicians (from 210 to 200) and a decrease in the number of other employees employed in R&D (from 190 to 170).

Block grants remained the largest source of funds with their relative contribution increasing from 49.9% in 2010 to 50.9% in 2011. Funding from UK Central Government/Local Authorities and Health Trusts/Hospitals increased by 4.9% from £37.9m in 2010 to £39.7m in 2011, accounting for 24.0% of HERD funding in 2011 compared to 23.2% in 2010.

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. 2010/2011 ending 31/7/2011. 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 2011 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	7,600	7,500	15,000	800	5,000	9,200	100	1,200	1,400	16,400
50- 249	25,100	20,500	45,600	*	*	14,100	*	*	3,700	49,200
250+	67,500	123,200	190,700	*	*	140,000	*	*	24,100	214,800
Total	100,200	151,100	251,300	5,100	83,000	163,300	2,700	26,400	29,100	280,400
Services & Other										
<50	23,900	9,500	33,400	1,200	14,800	17,300	300	1,200	1,600	34,900
50 -249	12,000	5,700	17,700	*	*	8,900	*	*	1,200	18,900
250+	15,900	2900	18,900	*	*	10,500	*	*	900	19,800
Total	51,800	18,100	69,900	2,200	31,000	36,700	400	3,300	3,700	73,700
All Industries										
<50	31,500	16,900	48,400	2,100	19,800	26,500	500	2,500	2,900	51,300
50-249	37,100	26,200	63,200	1,800	38,400	23,000	500	4,400	4,900	68,100
250+	83,500	126,100	209,600	3,400	55,800	150,500	2,100	22,900	25,000	234,600
Total	152,000	169,200	321,200	7,300	114,000	200,000	3,200	29,700	32,800	354,100

*Disclosive

Totals may not sum due to rounding

Table 2: Breakdown of Purchased R&D Expenditure 2011 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	700	1,100
	50-249	*	*	*	*
	250+	*	*	*	*
	Total	6,300	6,500	14,300	27,000
Services & Other					
	<50	1,100	2,200	1,100	4,500
	50-249	*	*	*	*
	250+	*	*	*	*
	Total	2,000	3,700	2,000	7,700
All Industries					
	<50	1,300	2,400	1,800	5,500
	50-249	700	1,900	13,000	15,700
	250+	6,200	5,900	1,500	13,500
	Total	8,300	10,200	16,300	34,700

*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) 2001-2011 (£m)²¹

	R&D Expenditure										
	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
Purchased	3.3	3.6	3.2	7.5	5.5	8.2	6.8	7.9	21.3	13.7	21.2
Total	43.4	66.8	56.4	62.3	74.9	81.6	117.2	106.1	144.3	133.4	140.6
(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
Purchased	1.8	3.8	1.6	1.4	1.0	2.2	1.4	5.5	5.3	6.1	13.5
Total	111.6	89.9	64.9	66.8	79.4	85.4	67.9	77.8	179.4	210.6	248.1
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
Purchased	5.1	7.3	4.8	8.8	6.5	10.4	8.2	13.3	26.5	19.8	34.7
Total	155.0	156.6	121.3	129.0	154.3	167.0	185.1	183.9	323.7	344.0	388.8

Totals may not sum due to rounding

²¹The European Commission definition of Small Medium Enterprises (SME) used is defined as being enterprises with less than 250 employees.

Table 4: Breakdown of 2011 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	*	*	160	110	*	*	100	60	*	*	110	70	330	50	380	250
	50-249	*	*	450	410	*	*	260	200	*	*	250	120	800	160	960	730
	250+	*	*	1,320	1,090	270	80	340	280	*	*	560	360	1,760	460	2,210	1,730
	Total	1,630	300	1,930	1,610	570	120	700	540	680	240	920	560	2,890	660	3,550	2,710
Services & Other																	
Employment Size-bands	<50	*	*	380	340	*	*	240	180	*	*	210	70	650	180	830	580
	50-249	*	*	130	130	*	*	150	110	*	*	60	50	220	120	340	290
	250+	*	*	280	260	290	100	390	330	*	*	50	50	550	170	730	640
	Total	640	150	800	730	580	200	780	620	200	120	320	160	1,420	470	1,890	1,510
All Industries																	
Employment Size-bands	<50	470	80	540	450	290	50	340	240	220	100	330	140	980	230	1,210	830
	50-249	480	100	580	530	310	90	410	310	230	80	310	170	1,020	270	1,290	1,020
	250+	1,320	280	1,600	1,360	560	180	730	600	430	180	610	410	2,310	630	2,940	2,370
	Total	2,270	450	2,720	2,350	1,150	320	1,480	1,150	880	360	1,240	720	4,310	1,130	5,440	4,220

*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 late 2013.

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