

Business Enterprise Research and Development Scotland 2016



A National Statistics publication for Scotland

BUSINESS AND ENERGY



BUSINESS AND ENERGY

This publication presents information on research and development (R&D) performed by businesses operating in Scotland in 2016 as well as revisions to previously published data for 2015 and 2014. The data in this release are sourced from the Business Enterprise Research and Development (BERD) survey conducted by the Office for National Statistics (ONS).

Note that this publication presents the latest statistics for private sector BERD only. Statistics on Gross Expenditure on R&D in 2016, of which BERD expenditure is a component, will become available in spring 2018.

Further information on Scottish R&D activity and the full set of tables are available at: <http://www.gov.scot/Topics/Statistics/Browse/Business/RD>

KEY POINTS

BERD expenditure in Scotland in 2016 was £1.072 billion, this is the highest figure since the start of the series in 2001. Scottish BERD expenditure represented 4.8 per cent of the UK total of £22.2 billion in 2016.

Scottish expenditure increased by 10.1% in real terms compared to 2015 figures. UK expenditure increased by 3.3% in real terms over this period.

BERD expenditure was 0.72% of Scottish GDP in 2016, the comparable figure was 1.12% for the UK.

BERD expenditure in Scotland is dominated by Manufacturing (£592 million), followed by Services (£366 million) and then 'Other' product groups (£114 million), such as 'extractive industries'.

Expenditure on Manufacturing R&D increased by 12.4% (£65 million) in real terms between 2015 and 2016, expenditure on Services R&D decreased by 0.8% (-£3.1 million) and expenditure on 'Other' R&D increased by 45.9% (£36 million).

Enterprises in Scotland employed 11,943 R&D staff in 2016, up from 11,864 in 2015, an increase of 0.7%. This is the highest level of BERD employment since the series began in 2001, when R&D employment stood at 7,210.

In 2016, around two thirds (62.5%) of BERD expenditure was undertaken by businesses located in just four local authority areas: City of Edinburgh (26.6%), Aberdeen City (15.4%), West Lothian (10.3%) and Glasgow City (10.2%).

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Background

The BERD survey follows the definition of research and development proposed by the Organisation for Economic Cooperation and Development (OECD) and published in the 'Frascati' Manual. According to the manual, R&D is defined as:

“creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge”. R&D must contain an appreciable amount of novelty.

National Indicator

BERD contributes to Scotland's Gross Expenditure on Research and Development (GERD), which forms the basis of the National Indicator: 'Increase Research and Development Spending'. This indicator compares Scotland's GERD as a percentage of GDP with the equivalent average figure for the EU 28. The figures for GERD will become available in spring 2018.¹

Scottish Gross Domestic Product (GDP)²

Scottish GDP in constant basic prices grew each year from 1998 reaching a peak in Q2 of 2008. Scotland then entered recession, which lasted six quarters and returned to growth in Q1 of 2010. Further short periods of economic contraction occurred later in 2010, and then in early 2012. Since 2012 there has been year-on-year growth. The most recent data show that between the four quarters ending in Q2 2016 and the four quarters ending in Q2 2017, Scottish GDP grew at a rolling annual rate of 0.4%, with 1.7% growth in the Service sector offsetting contractions of 5.2% in the Construction sector and 3.0% in the Production sector. Service sector growth over the period was driven by Business Services and Finance. The Production sector contraction partly reflects the impact of the slowdown in the oil and gas sector.

BERD Expenditure

The value of Business Enterprises Research and Development (BERD) undertaken in Scotland in 2016 was £1.072 billion, 4.8% of the UK total and 0.72% of Scottish GDP. Expenditure has increased by £98 million (in real terms) since 2015, which represents a 10.1% increase in real terms. BERD expenditure is now at the highest level in the series back to 2001; this is the first time that BERD spend has exceeded £1 billion.

BERD expenditure in Scotland is dominated by spend on Manufacturing (£592 million), followed by Services (£366 million) and then 'Other' product groups (£114 million), such as 'Extractive Industries'. Since 2001, overall BERD expenditure has

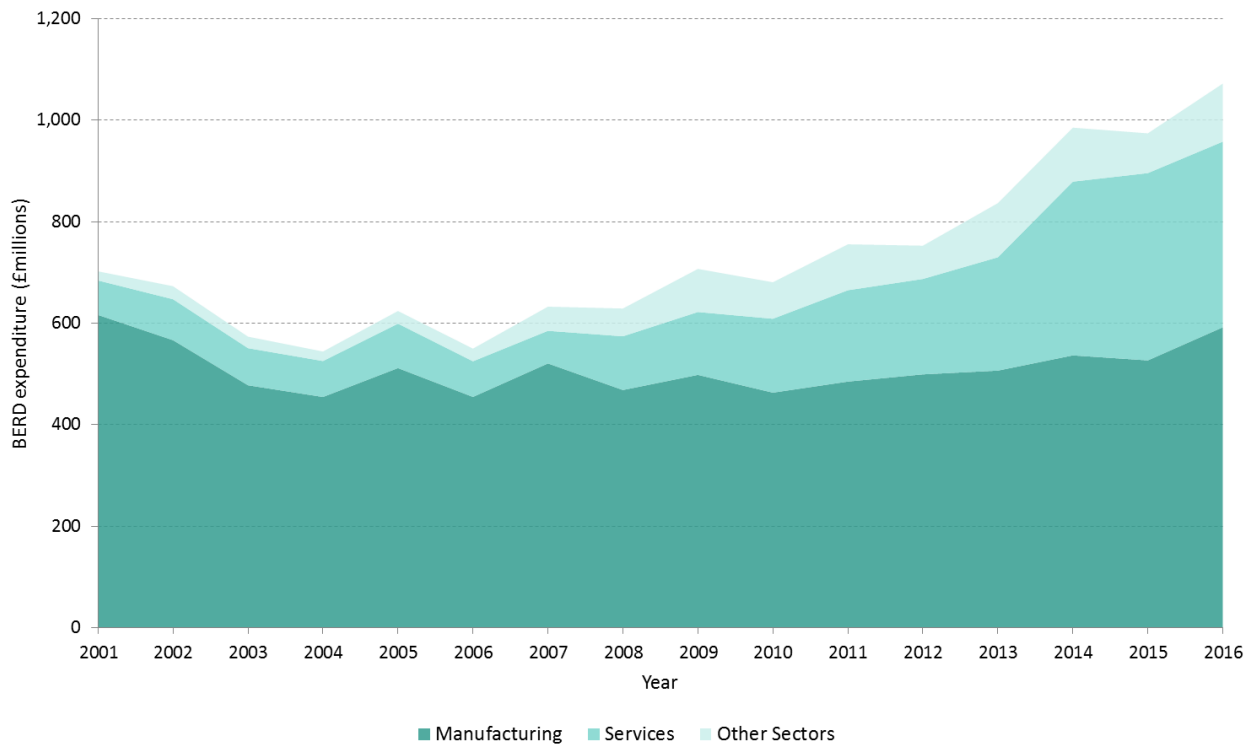
¹ Information on the range of targets and indicators which comprise the National Performance Framework can be found on the Scotland Performs website:

<http://www.gov.scot/About/Performance/scotPerforms>

² <http://www.gov.scot/Topics/Statistics/Browse/Economy/PubGDP/GDP2017Q2/>

increased by 52.7% in real terms. When this overall trend is broken down, to the broad product groups of R&D expenditure, it shows that Manufacturing expenditure has decreased by 3.9% since 2001, whereas in 2016 expenditure in the other two main broad product groups was over five times what it was in 2001.

Figure 1: BERD expenditure on R&D performed in Scotland in real terms, from 2001 to 2016



In the short term, expenditure on Manufacturing R&D increased by 12.4% (£65 million) in real terms between 2015 and 2016, expenditure on Services R&D decreased by 0.8% (-£3.1 million) and expenditure on 'Other' R&D increased by 45.9% (£36 million).

This rise in spending on Manufacturing R&D, between 2015 and 2016, is mainly driven by a £53.5 million (33.7%) increase in spending on 'Electrical Machinery'. 'Transport Equipment & Aerospace' as well as 'Other Manufacturing' also saw increases in spending, whereas 'Chemicals' and 'Mechanical Engineering' experienced decreases, over the latest year.

Overall, there was a fall in R&D spending on Services; a decrease in R&D spending in the 'Computer programming and information services activities' and 'Software development' detailed product groups (together down £9.6 million) contributed to this drop.

Within the 'Other' broad product group, 'Extractive Industries' R&D expenditure increased by £27.5 million (70.1%) in real terms between 2015 and 2016 – following a dip in BERD spend in 2015. 'Agriculture, hunting & forestry; Fishing' and 'Construction' also experienced large percentage increases in R&D spending

(29.2% and 43.5% respectively) – although BERD spending for these two product groups is relatively small scale.

R&D expenditure in Scotland can fluctuate significantly year on year, especially given that R&D expenditure is concentrated in a small number of large companies. In 2016, five businesses accounted for just over a quarter (25.7%) of Scottish BERD expenditure. This is a sizeable share of the total R&D expenditure; however it represents a fall in the dominance of the top businesses since 2001. In 2001, the top five businesses accounted for just over half of BERD expenditure.

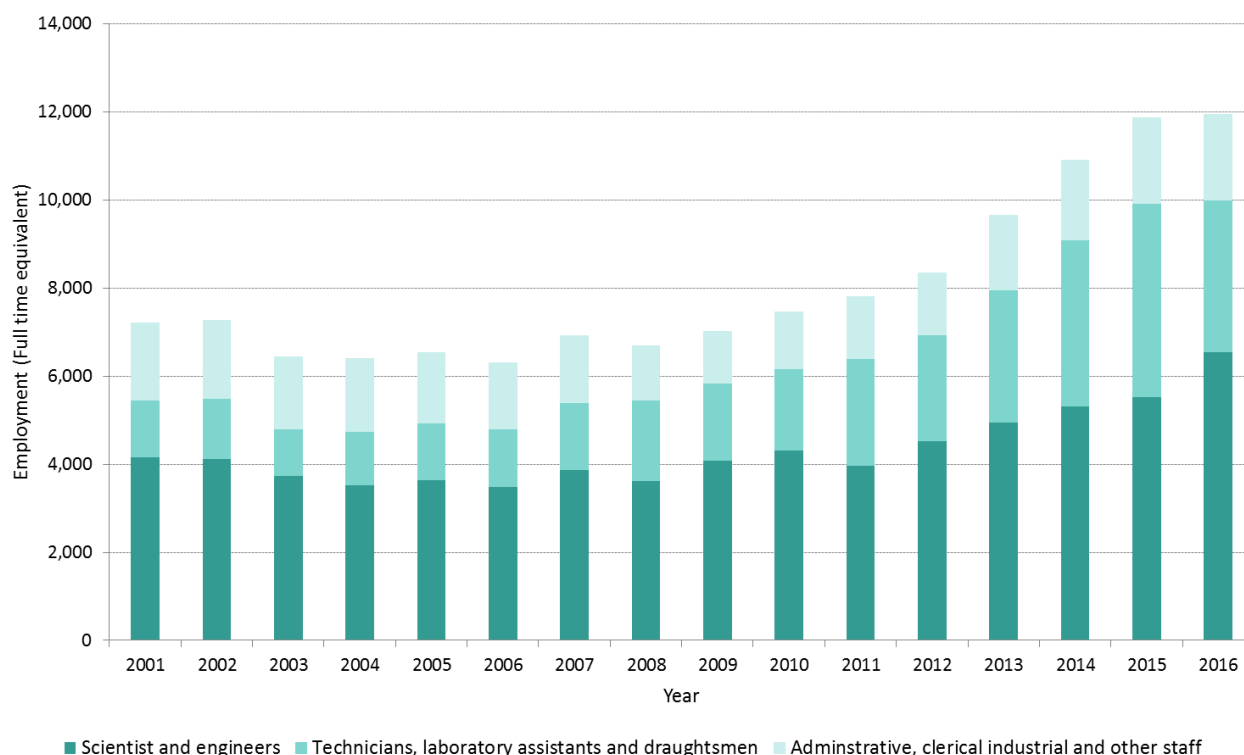
BERD Employment

Enterprises in Scotland employed 11,943 R&D staff in 2016, an increase from 11,864 in 2015. This is the highest level of R&D employment since the series began in 2001, when R&D employment stood at 7,210.

The number of scientist and engineer roles, which represents over half of all R&D jobs (54.8%), increased by 18.4% between 2015 and 2016, whereas the number of technicians, laboratory assistants and draughtsmen decreased by 21.6% over the same period.

Half (50.3%) of all BERD jobs are in Manufacturing, which saw a 13.4% increase in employment since 2015. In contrast, Services experienced a 12.2% decrease in employment over the latest year.

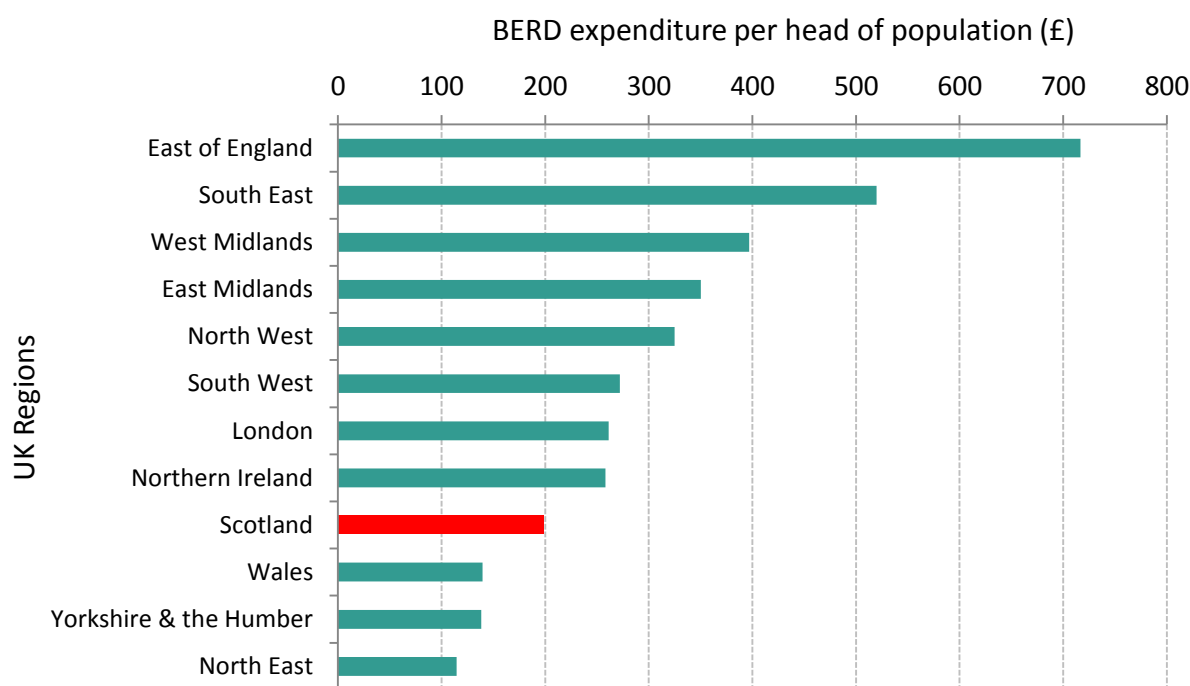
Figure 2: Employment in R&D in businesses in Scotland from 2001 to 2016



UK regional comparisons

In 2016, BERD expenditure was equivalent to 0.72% of GDP in Scotland compared to 1.12% of GDP in the UK. In 2016, the average BERD spend per head of population was £198 in Scotland, which is around 60% of the £339 average spend per head of population across the UK. Only Wales, Yorkshire and the Humber and the North East spent less per head than Scotland. In contrast, spending in the East of England was £717 per head (more than two times the average spend in the UK) and £520 per head in the South East; together these two regions were responsible for 40.9% of all BERD expenditure in the UK (19.8% and 21.1% respectively).

Figure 3: BERD expenditure in 2016 per head of population by UK region



In terms of expenditure as a percentage of GDP, Scotland ranked 8th out of the 12 UK regions/countries in 2016.

Between 2015 and 2016, BERD expenditure in Scotland increased by 10.1% in real terms – exceeding the 3.3% increase across the UK as a whole; only London and Wales exhibited a greater increase in spending. Since 2007, expenditure in Scotland has increased by 69.5% in real terms, exceeding the UK expenditure increase of 21.6% over the same period. And therefore Scottish BERD expenditure as a proportion of UK BERD expenditure has increased, from 3.5% to 4.8%, between 2007 and 2016.

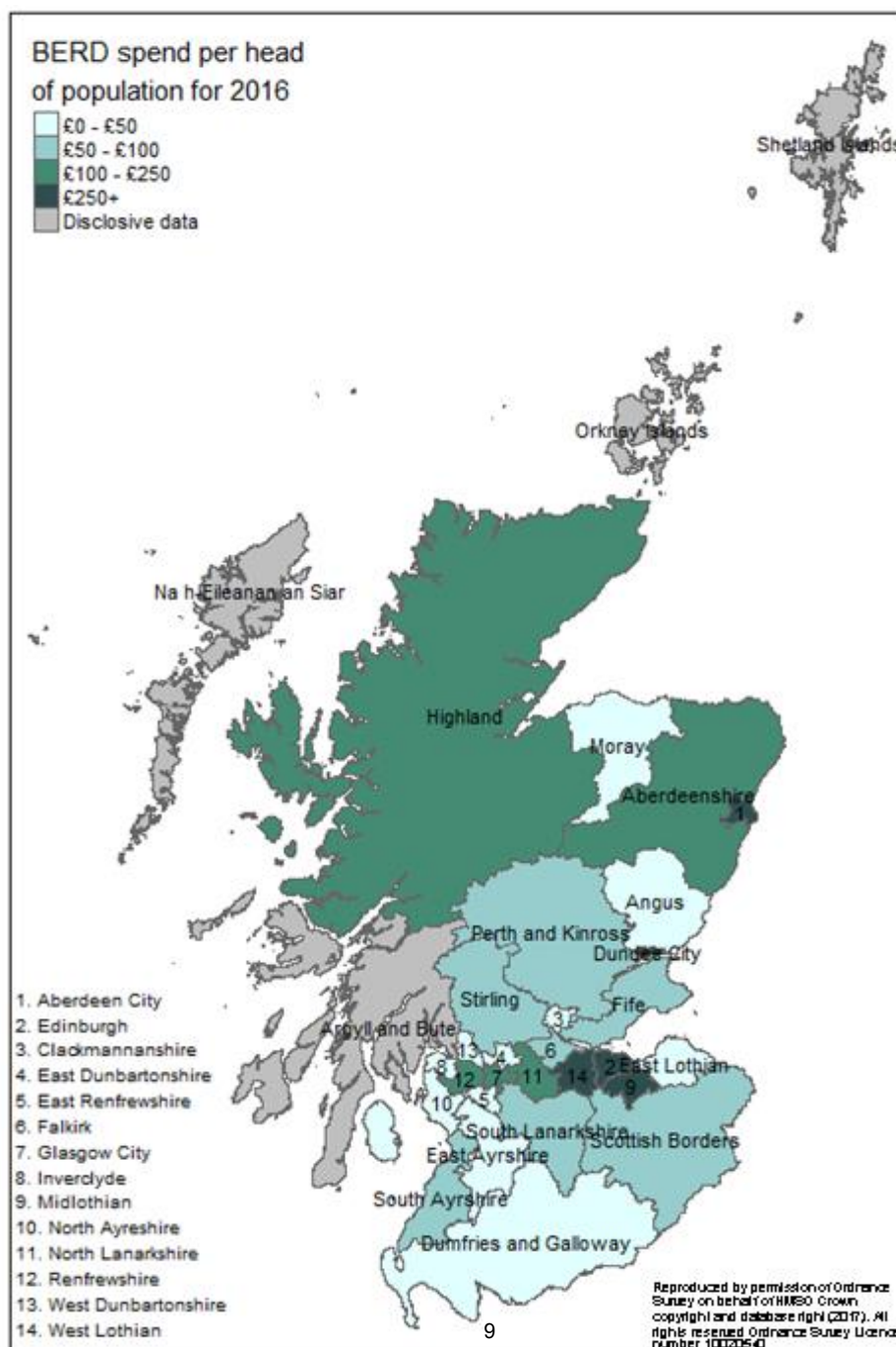
Scottish Local Authority Area Comparisons

In 2016, around two thirds (62.5%) of BERD expenditure was undertaken by businesses located in just four local authority areas: City of Edinburgh (26.6%), Aberdeen City (15.4%), West Lothian (10.3%) and Glasgow City (10.2%). However, West Lothian saw a £25 million decrease in BERD spending between 2015 and 2016, whereas Edinburgh and Glasgow experienced increased spending over this period (increases of £31 million and £20 million respectively). Although smaller in

value, Falkirk experienced a 173% increase in BERD spending over the latest year; within South Ayrshire and South Lanarkshire spending on R&D by businesses increased by over 50% between 2015 and 2016. West Dunbartonshire experienced the largest percentage decrease in BERD spending (down 71.3% over the latest year).

Per head of the population, Aberdeen City had the highest spend at £717 per head, which is around four times the Scottish average of £198 per head. West Lothian (£613) and City of Edinburgh (£563) have the next largest spends per head of population. As with the overall expenditure pattern for Scotland, Manufacturing R&D expenditure dominates in the City of Edinburgh and West Lothian (61.7% and 76.6% of R&D spending respectively), whereas in Aberdeen City and Glasgow City more was spent on Services R&D (44.8% and 69.5% of total BERD respectively).

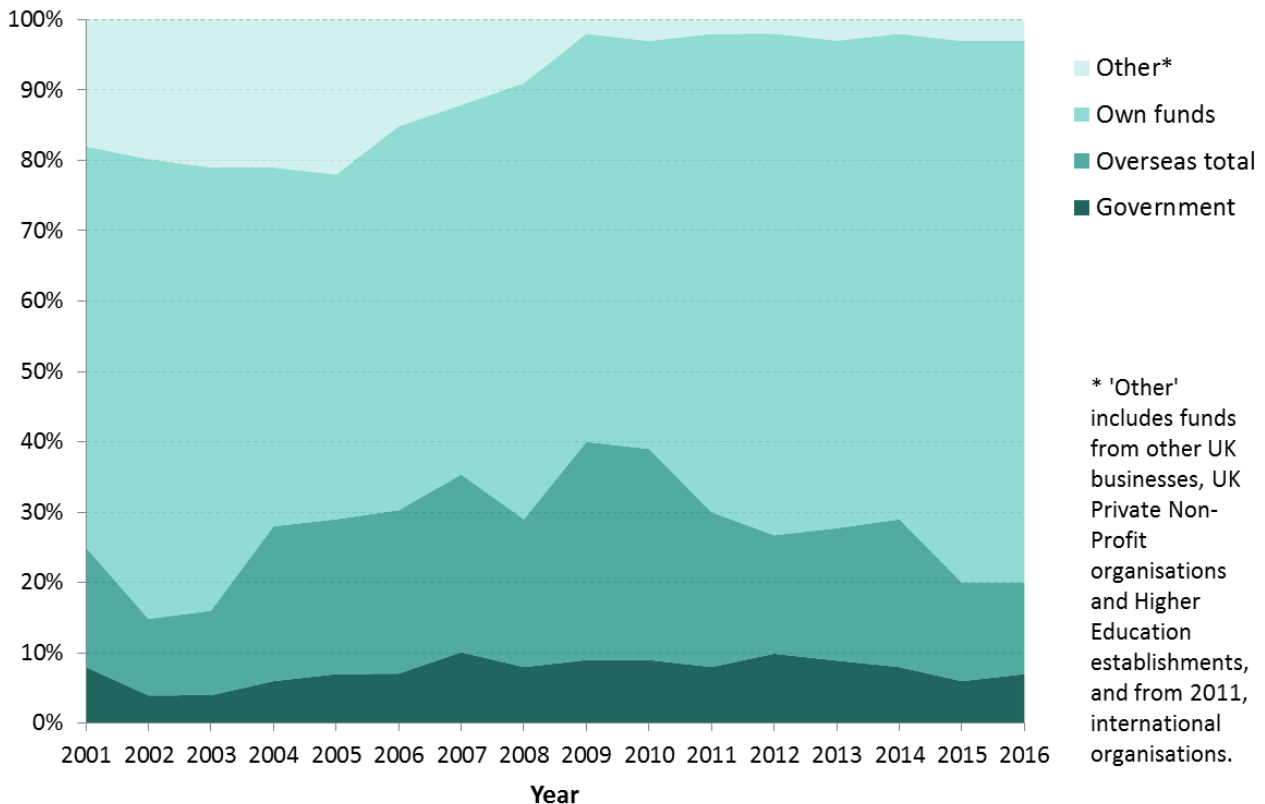
Figure 4: BERD expenditure in 2016 per head of population according to Scottish Local Authority



R&D performing businesses

In 2016, 77.0% of R&D undertaken by businesses in Scotland was funded by the businesses themselves, 13.4% came from overseas and 6.9% was funded by the government.

Figure 5: Sources of funds for R&D performed in businesses in Scotland between 2001 and 2016



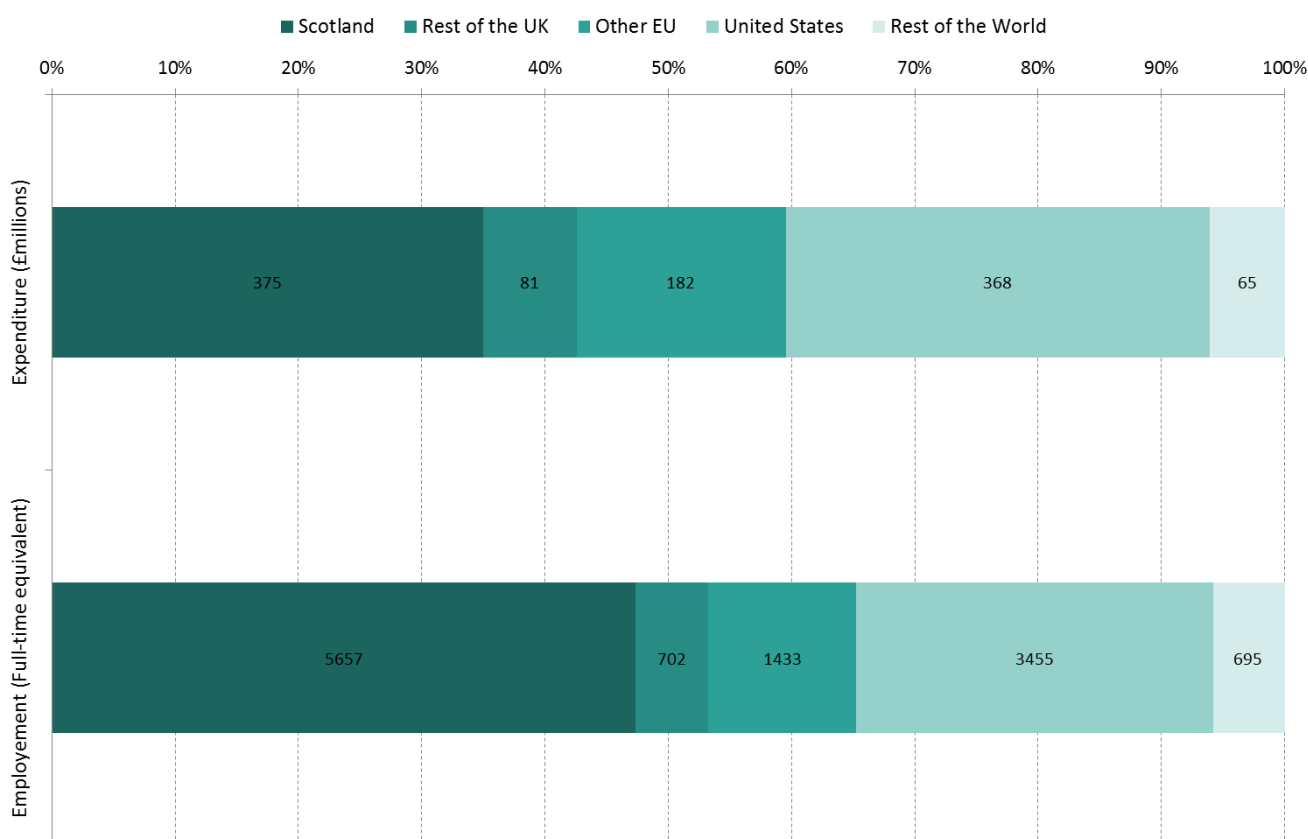
In terms of business size, the largest businesses (400 employees and over) accounted for the majority (58.3% in 2016) of total BERD expenditure – over the latest year the largest businesses have become slightly less dominant (share of 59.9% in 2015).

The majority of R&D spending in the largest businesses, and those with 100-399 employees, was on Manufacturing, whereas in the smallest companies (0-99 employees) 67.9% of spending was on Services.

Scottish-owned businesses undertook 35.0% of BERD expenditure in Scotland in 2016, followed by US-based businesses (34.3%). The majority of R&D spending in Scottish-owned businesses was on Services (63.3%) whereas the US-owned businesses spent most on Manufacturing R&D (75.1%).

In terms of employment, the largest share of BERD employment was in Scottish-owned businesses (47.4%), with a further 28.9% in US-owned businesses.

Figure 6: BERD expenditure and R&D employment by country of ownership of business 2016



Growth Sectors³

[Scotland's Economic Strategy](#) identified the following industry groups as key growth sectors where Scotland has a distinct comparative advantage:

- Food & Drink (including agriculture & fisheries)
- Creative Industries (including digital)
- Sustainable Tourism
- Energy (including renewables)
- Financial & Business Services
- Life Sciences

The Growth Sectors account for a high proportion of business R&D spending in Scotland - £715 million (or 66.7%) of the Scottish total in 2016. In 2016, Life Sciences had the highest BERD spend at £265 million, followed by Creative Industries (£165 million), Financial and Business Services (£145 million) and Energy (£101 million). Since 2009, the increase in BERD spend has been particularly significant for the Financial and Business Services growth sector.

³ Growth sectors are based on Standard Industrial Classification 2007 codes. More information on how the growth sectors are defined is available at: <http://www.gov.scot/Topics/Statistics/Browse/Business/Publications/GrowthSectors>

BACKGROUND NOTES

Definition of R&D

1. While R&D is often thought of as synonymous with high-tech firms that are on the cutting edge of new technology, many established consumer goods companies spend large sums of money, on a systematic basis, improving existing products.
2. 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.
3. The majority of the data presented in this release are sourced from the Business Enterprise R&D (BERD) survey conducted by the Office for National Statistics (ONS).
4. The ONS BERD survey follows the definition of research and development proposed by the Organisation for Economic Cooperation and Development (OECD) and published in the 'Frascati' Manual. According to the manual, R&D is defined as:

“creative and systematic work undertaken in order to increase the stock of knowledge - including knowledge of humankind, culture and society - and to devise new applications of available knowledge”. R&D must contain an appreciable amount of novelty.

5. 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.

Sampling and Regional Estimates

6. The ONS BERD survey is an annual sample survey based on a continually updated register of R&D performers. The ONS 2016 BERD Statistical Bulletin is available at:

<https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/bulletins/businessenterpriseresearchanddevelopment/2016>.

7. The Northern Ireland Research and Development 2016 statistics are published at: <https://www.nisra.gov.uk/statistics/business-statistics/research-and-development>.

8. The UK sample size is approximately 5,500 businesses (4,000 in GB and 1,500 in NI) - the response rate is normally around 92%. For Great Britain, a stratified random sample is used where the strata are defined as:

- businesses that have previously reported R&D expenditure above a threshold (greater than £5.7 million for the 2016 survey (referred to as “large R&D performers”)).

- the remaining businesses identified as (or potential) R&D performers (referred to as “smaller R&D performers”) are allocated into strata using their employment and industry product group

9. In 2016, the large R&D performers accounted for approximately 78% of total expenditure. Each of these large R&D performers is asked to name all the sites at which the business performed R&D and to estimate the R&D spend at that site, this expenditure is then allocated to the appropriate region. Regional data for the smaller R&D performers are estimated from sample returns.

10. A summary quality report for the ONS BERD survey is available at: <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/researchanddevelopmentexpenditure/methodologies/ukbusinessenterpriseresearchanddevelopmentsurveyqmi>

Coverage

11. BERD includes business enterprise R&D performed in Scotland irrespective of the residence of the ultimate owner.

12. BERD excludes R&D funded by Scottish businesses that is performed overseas.

13. BERD excludes R&D carried out by higher education or government (including government departments, agencies and non-departmental public bodies; local authorities; and private non-profit organisations). Public corporations are counted as business enterprises.

14. Gross expenditure on R&D in Scotland in 2016 performed by all sectors of the economy (i.e. business, higher education and government) will be reported separately in spring 2018.

Product Groups

15. The 400 large R&D performers are asked to select the industry product groups that best describe the type of R&D activities they undertake. In 2009, these product groups were updated to better reflect the new Standard Industrial Classification (SIC 2007) codes. For the smaller R&D performers, no product group data are collected in the BERD survey. However, the business' Standard Industrial Classification (SIC) codes are known from the Inter-Departmental Business Register (IDBR) and the assumption is made

that the R&D expenditure is for the detailed product group corresponding to that SIC. This approach must be regarded as approximate since, in practice, an individual business can perform R&D for a range of product groups.

16. The introduction of SIC 2007 in the 2009 survey resulted in some businesses' R&D moving to a different product group than previously published. The largest impact was for businesses with Publishing activities, as these moved out of the manufacturing sector to be included under Miscellaneous business activities. There was an increase in the Other manufactured goods product group due to businesses being reclassified from Textiles, clothing and leather products, Pulp and paper products, Rubber and plastic products, Fabricated metal products, Machinery and equipment and Precision instruments and optical products.
17. The broad product groups, which consist of aggregations of the detailed product groups, were refined and expanded in 2002 in order to more accurately categorise the data within the manufacturing and service sectors. Since 2011, sewerage and waste management is included in the Other sectors total, when previously it was included in manufacturing.

Discontinuities in the data

18. The BERD survey questionnaire was redesigned from the 2007 survey to better reflect user needs and to address concerns about data quality and difficulty in completion. While the changes are an improvement, they could have an impact on the comparability of the data returned. Unfortunately, it is not possible to measure this impact.

Employment

19. Employment is calculated by respondents to the ONS BERD survey on the basis of 'full-time equivalent' staff average over the year. The categories of employment used are:
 - Researchers (scientists and engineers) – engaged in the conception or creation of new knowledge, products, methods and systems
 - Technicians – perform scientific and technical tasks normally under the supervision of researchers
 - Other (administrative) – support staff including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects

Real Terms

20. The cash values are converted to real terms using Treasury GDP deflators. The deflators are available at:

<https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-september-2017-quarterly-national-accounts-september-2017>

Time period for which the results relate

21. Respondents to the ONS BERD survey were asked to make a return for the calendar year 2016 or the nearest 12 month period for which figures were available. Data for all years published were collected on the same basis.

Revisions Policy

22. BERD Scotland follows the Revisions Policy for the ONS BERD results – the latest (year t) results are provisional until two years later (year t+2).

Latest Revisions

23. The 2014 and 2015 data have been revised to take account of company misreporting and late returns.
24. One indication of the reliability of the main indicators in this release can be obtained by monitoring the size of revisions. Table 1 records the size and pattern of revisions that have occurred over the last 5 years.

Table1: Revisions between first publication and most recent estimate, figures in thousands

Year		Year in which data was published					Change in expenditure between first and last estimate
		2012	2013	2014	2015	2016	
Year the data relates to	2012	£706,804	£709,047	£708,662			£1,858
	2013		£797,704	£896,528	£801,043		£3,339
	2014			£905,193	£874,020	£957,080	£51,887
	2015				£870,863	£952,626	£81,763
	2016					£1,072,134	-

25. There has been a large revision in the 2015 data between the 2015 publication and the 2016 publication, this is partly due to a large increase in expenditure in the 'Miscellaneous business activities; Technical testing and analysis' Service product group.

Sampling variability

26. The estimates in this publication are based on a stratified sample drawn from the population of businesses known to actually perform R&D or are likely to be R&D performers. As with any sample survey, the R&D survey is subject to two types of possible errors:
- Sampling errors, due to only a sample of the population being surveyed. The difference between the estimates derived from the

sample and value that would be obtained from a census is referred to as the sampling error. The Business Enterprise Research and Development Survey has provided standard errors information in the past but the methodology for estimation of the standard errors used to measure these is currently under review.

- Non-sampling errors – these include factors such as population coverage misreporting and non-response bias; these errors are generally hard to quantify, because of the problems ensuring that businesses adhere to Frascati R&D definitions.

Analysis of R&D Expenditure by SMEs (small and medium sized enterprises)

27. A table giving estimates of R&D expenditure by SMEs has been included. The SME definition used is that under European Commission Recommendation (2003/361/EC) of 1 January 2003, in which SMEs are defined as enterprises with less than 250 employees. In addition, a criterion of independence is used to exclude enterprises that are part of a larger enterprise group, so that only true SMEs are evaluated. This criterion is important in the context of R&D estimates, given that R&D activity is often carried out by smaller businesses which form part of larger, sometimes multinational businesses.
28. To apply the SME definition, historic information on business ownership has been obtained using that currently held on the IDBR. Caution should therefore be used in making comparisons over time.

Code of Practice for Official Statistics

29. This is a National Statistics publication. It has been produced to the high professional standards set out in the Code of Practice for Official Statistics.
30. In 2012, the Scottish Government Research and Development statistical publications were assessed by the United Kingdom Statistics Authority (UKSA) for compliance against the Code of Practice for Official Statistics. Details of the assessment are available at:
<https://www.statisticsauthority.gov.uk/archive/assessment/assessment/assessment-reports/assessment-report-189---statistics-on-scottish-businesses-and-research-and-development.pdf>
31. The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs

- are well explained and readily accessible
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.

32. A UKSA assessment was also carried out for the ONS Research and Development statistical publications in 2012. Details of the assessment are available at:

<https://www.statisticsauthority.gov.uk/archive/assessment/assessment/assessment-reports/assessment-report-218---statistics-on-research-and-development.pdf>

Uses

33. Information from the Scottish BERD publication is used by the Scottish Government to monitor performance and inform economic policy. Some of the external users of R&D statistics published by the Scottish Government include the Enterprise Networks and Local Authorities. More information on uses can be found in the on-line [Research and Development Data Sources, Suitability and Uses Note](#).
34. The Scottish Government conducted a user consultation seeking users' views on the format and content of the BERD and GERD publications in Autumn 2010. The results of this consultation can be viewed here: <http://www.gov.scot/Topics/Statistics/Browse/Business/scotstat/RDFindingsReport>

User Engagement

35. If you would like to be kept informed about on-going developments with regards to the Scottish BERD publication and future releases of R&D data, please register to receive updates via [Scotstat](#) (under Economy topic pick R&D and Innovation).
36. There is also the ScotStat Scottish Economic Statistics Consultation Group (SESCG) – more information on the group is available at: <http://www.gov.scot/Topics/Statistics/Browse/Economy/ScotStat/comms>

If you would like to join SESCAG or provide feedback on the Scottish BERD publication, please contact us at:

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36. There is also an ONS-led user community that may be of interest to R&D users. Details of this are available at the Business and Trade Statistics Community on the [StatsUserNet](#) website.

Table 1A
Expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2001 to 2016¹
Current Prices

	£ thousands															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Manufacturing	453,440	426,576	367,555	359,558	415,191	380,637	446,654	412,160	444,825	421,098	447,288	469,945	485,035	521,278	515,138	591,911
Chemicals	180,469	177,405	160,126	153,483	173,096	136,059	154,602	156,282	169,397	155,658	123,997	127,844	136,716	158,840	167,441	166,716
Mechanical Engineering	51,819	63,272	48,285	53,665	23,264	21,491	26,850	19,037	27,278	..	33,854	24,923	42,358	39,555	47,058	39,256
Electrical Machinery	57,695	64,960	48,230	56,770	98,006	92,531	110,326	111,954	108,353	106,122	106,133	124,135	151,144	173,465	155,152	212,155
Transport Equipment & Aerospace	3,779	4,916	6,245	6,998	6,528	5,031	10,149	5,381	15,738	..	7,268	9,787	7,080	6,681	11,689	26,084
Other Manufacturing	159,678	116,023	104,670	88,642	114,298	125,525	144,727	119,506	124,059	124,966	176,037	183,257	147,737	142,736	133,798	147,699
Services	50,016	60,757	56,272	56,017	71,053	58,705	55,100	93,185	110,596	132,397	165,980	177,043	213,851	332,568	360,819	365,861
Other Sectors	13,213	19,377	17,438	14,804	20,215	20,914	40,843	48,165	75,744	65,323	83,430	61,673	102,156	103,234	76,669	114,362
Agriculture, hunting & forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,249	8,254
Extractive industries	11,270	17,701	14,701	12,225	18,227	19,136	30,958	34,007	53,805	38,560	54,607	33,878	58,118	49,005	38,395	66,781
Electricity, gas & water supply; Waste management ²	..	..	..	..	..	..	..	..	..	..	..	..	22,354	30,588	19,945	21,595
Construction	..	..	..	1,556	1,085	327	485	..	999	350	1,441	9,380	..	..	12,080	17,732
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details
2. From 2009 onwards. Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other Manufacturing
3. r denotes revised figures
4. .. denotes disclosive value
5. - denotes nil figures unavailable or too small to display
6. Totals may not sum due to rounding.

Table 1B
Expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2001 to 2016¹
In Real Terms (2016 prices²)

	£ thousands															
	2001 ^r	2002 ^r	2003 ^r	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^r	2009 ^r	2010 ^r	2011 ^r	2012 ^r	2013 ^r	2014 ^r	2015 ^r	2016
Manufacturing	616,246	566,480	477,649	454,602	511,584	454,769	520,715	468,321	498,196	463,163	484,981	499,177	506,554	536,625	526,758	591,911
Chemicals	245,265	235,589	208,089	194,054	213,283	162,557	180,237	177,577	189,722	171,207	134,446	135,796	142,781	163,517	171,218	166,716
Mechanical Engineering	70,424	84,023	62,747	67,851	28,664	25,676	31,302	21,631	30,551	..	36,707	26,473	44,237	40,719	48,120	39,256
Electrical Machinery	78,410	86,265	62,676	71,776	120,759	110,553	128,619	127,209	121,353	116,722	115,076	131,856	157,850	178,572	158,651	212,155
Transport Equipment & Aerospace	5,135	6,528	8,115	8,848	8,043	6,011	11,832	6,115	17,627	..	7,881	10,396	7,394	6,878	11,953	26,084
Other Manufacturing	217,010	154,075	136,021	112,073	140,834	149,972	168,724	135,790	138,944	137,449	190,871	194,656	154,291	146,939	136,816	147,699
Services	67,974	80,683	73,127	70,824	87,549	70,138	64,236	105,882	123,866	145,622	179,967	188,056	223,338	342,360	368,958	365,861
Other Sectors	17,957	25,732	22,661	18,717	24,908	24,987	47,615	54,728	84,832	71,848	90,461	65,509	106,688	106,273	78,398	114,362
Agriculture, hunting & forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,390	8,254
Extractive industries	15,316	23,506	19,105	15,456	22,459	22,863	36,092	38,641	60,261	42,412	59,208	35,985	60,697	50,447	39,261	66,781
Electricity, gas & water supply; Waste management ³	..	..	..	..	..	..	..	..	..	..	..	..	23,345	31,489	20,395	21,595
Construction	..	..	..	1,967	1,337	391	565	..	1,119	385	1,563	9,964	..	..	12,353	17,732
Grand Total	702,177	672,895	573,436	544,142	624,041	549,893	632,566	628,931	706,895	680,633	755,408	752,742	836,580	985,258	974,115	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details
2. HM Treasury GDP deflators are used to convert the data to 2016 prices
3. From 2009 onwards. Waste management is included in Electricity, gas & water supply; waster management, when previsouly it was included in Other Manufacturing
4. r denotes revised figures
5. .. Denotes disclosive value
6. - denotes nil figures unavailable or too small to display
7. Totals may not sum due to rounding

Table 2A
Expenditure on R&D performed within businesses in Scotland: Current Prices
Detailed Product Groups, 2001 to 2016¹

	£ thousands																% of 2016
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Manufacturing																	
Food products and beverages; Tobacco products	2,367	6,147	3,120	3,762	5,176	7,490	7,689	7,000	9,871	9,919	15,517	13,514	18,040	16,397	12,555	25,958	2.4%
Textiles, clothing and leather products	1,461	1,357	1,754	5,661	946	1,217	2,246	1,257	1,085	1,925	2,086	3,883	3,313	6,050	5,268	2,590	0.2%
Pulp, paper and paper products; Printing, Wood and straw products	..	775	1,855	2,075	1,520	1,157	3,023	2,646	1,363	1,767	887	1,979	2,718	2,344	2,362	3,064	0.3%
Refined petroleum products and coke oven products	..	..	..	..	..	..	..	..	..	..	..	..	..	..	460	..	..
Chemicals and chemical products	27,315	18,996	16,065	16,742	13,942	11,208	11,917	7,270	4,886	9,436	6,557	6,645	..	..	..	50,727	4.7%
Pharmaceuticals	153,154	158,409	144,062	136,741	159,154	124,851	142,685	149,012	164,510	146,222	117,439	121,199	..	..	..	115,989	10.8%
Rubber and plastic products	1,141	2,304	4,551	1,584	2,989	3,183	3,268	3,761	3,448	4,752	4,450	4,467	4,799	5,079	7,633	8,175	0.8%
Other non-metallic mineral products	..	..	..	..	1,107	648	661	68	633	620	570	532	..	782	481	607	0.1%
Casting of iron and steel	..	594	..	..	..	..	..	..	..	..	..	..	145	336	..	..	..
Non-ferrous metals	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	452	0.0%
Fabricated metal products except machinery and equipment	5,381	8,619	5,372	3,976	3,740	3,522	5,505	3,857	7,956	5,265	11,602	4,831	13,528	7,111	7,169	6,061	0.6%
Machinery and equipment	46,438	54,653	42,913	49,689	19,523	17,969	21,345	15,179	19,322	21,159	22,252	20,091	28,830	32,444	39,889	33,195	3.1%
Computers and peripheral equipment	3,497	4,016	1,409	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Electrical equipment	20,142	15,682	6,662	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Consumer electronics and communication equipment	34,056	45,262	40,158	41,096	48,056	43,440	44,404	51,586	56,352	60,943	66,193	74,490	94,836	111,155	100,368	128,374	12.0%
Precision instruments and optical products; photographic equipment	150,745	103,408	90,645	73,580	99,677	110,680	123,872	103,251	98,851	90,123	126,655	130,603	93,524	72,991	63,204	83,530	7.8%
Motor vehicles and parts	2,474	2,222	4,498	1,998	3,828	2,944	6,258	2,302	1,990	3,332	..	4,182	..	1,931	3,406	18,054	1.7%
Other transport equipment	..	..	..	1,270	904	..	..	..	..	..	..	..	..	..	..	..	..
Shipbuilding	..	..	..	..	..	..	1,596	..	..	..	2,971	2,474	..	..	..	..	..
Aerospace	..	..	..	..	..	..	..	..	11,524	..	..	3,131	3,078	3,234	6,605	6,219	0.6%
Other manufactured goods	1,536	883	1,219	834	2,451	864	1,239	901	8,189	14,944	22,285	26,710	24,756	38,236	40,557	21,905	2.0%
Sewerage, waste management, remediation activities ²	..	..	..	..	..	34	108	35	..	..	..	..	..	..	..	..	..
Services																	
Wholesale and retail trade	1,500	3,138	1,422	2,380	2,567	4,085	753	5,369	6,954	10,732	10,797	8,805	5,786	8,041	11,004	18,449	1.7%
Transport and storage, incl. postal and courier activities	..	..	..	..	291	..	..	..	..	399	3,200	..	708	..	..	..	..
Telecommunications	..	..	..	..	10,454	..	..	..	4,586	1,513	2,566	..	1,706	1,497	10,626	6,336	0.6%
Miscellaneous business activities; Technical testing and analysis	9,963	13,822	9,697	10,974	18,762	12,773	15,194	31,018	32,242	38,553	44,305	55,883	76,227	140,468	131,635	137,991	12.9%
Computer programming and information services activities ⁷	16,283	18,281	21,301	25,587	27,574	24,911	25,143	30,190	33,981	32,350	46,187	71,749	67,658	74,665	86,573	40,264	3.8%
Software development ⁷	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38,695	3.6%
Research and development services	15,324	18,672	17,543	9,899	9,411	5,189	6,284	24,396	30,414	45,108	54,968	36,602	44,565	46,503	57,264	62,560	5.8%
Public administration	..	1,531	1,016	2,182	1,993	3,350	2,716	799	..	3,741	3,957	2,832	17,201	..	..	..	..
Other Sectors																	
Agriculture, hunting and forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,249	8,254	0.8%
Extractive Industries	11,270	17,701	14,701	12,225	18,227	19,136	30,958	34,007	53,805	38,560	54,607	33,878	58,118	49,005	38,395	66,781	6.2%
Electricity, gas and water supply	..	..	..	..	..	..	..	..	..	..	..	..	..	29,894	19,224	21,309	2.0%
Sewerage, waste management, remediation activities	..	..	..	..	..	..	..	..	..	435	..	..	..	695	721	286	0.0%
Construction	..	..	..	1,556	1,085	327	485	..	999	350	1,441	9,380	..	..	12,080	17,732	1.7%
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134	100.0%

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. ^r denotes revised figures.
4. .. denotes disclosive value.
5. - denotes nil. figures unavailable or too small to display.
6. Totals may not sum due to rounding
7. Prior to 2016 Software development was included in Computer programming and information services activities

Table 2B
Expenditure on R&D performed within businesses in Scotland: In Real Terms (2016 prices)
Detailed Product Groups, 2001 to 2016¹

	£ thousands															% of 2016	
	2001 ^r	2002 ^r	2003 ^r	2004 ^r	2005 ^r	2006 ^r	2007 ^r	2008 ^r	2009 ^r	2010 ^r	2011 ^r	2012 ^r	2013 ^r	2014 ^r	2015 ^r	2016	Total
Manufacturing																	
Food products and beverages; Tobacco products	3,216	8,162	4,054	4,756	6,377	8,949	8,964	7,954	11,055	10,909	16,824	14,355	18,840	16,879	12,838	25,958	2.4%
Textiles, clothing and leather products	1,986	1,802	2,279	7,157	1,166	1,454	2,618	1,429	1,216	2,117	2,262	4,124	3,460	6,228	5,387	2,590	0.2%
Pulp, paper and paper products; Printing, Wood and straw products	..	1,029	2,411	2,623	1,873	1,383	3,524	3,006	1,527	1,944	962	2,102	2,838	2,413	2,416	3,064	0.3%
Refined petroleum products and coke oven products	..	..	..	..	..	..	..	..	..	..	..	..	..	..	471	..	..
Chemicals and chemical products	37,122	25,227	20,877	21,168	17,179	13,391	13,893	8,260	5,473	10,378	7,110	7,058	..	..	..	50,727	4.7%
Pharmaceuticals	208,143	210,362	187,212	172,886	196,103	149,167	166,344	169,317	184,249	160,829	127,336	128,738	..	..	..	115,989	10.8%
Rubber and plastic products	1,550	3,060	5,914	2,003	3,683	3,803	3,810	4,273	3,862	5,227	4,825	4,745	5,012	5,229	7,805	8,175	0.8%
Other non-metallic mineral products	..	..	..	..	1,364	774	771	77	709	682	618	565	..	805	492	607	0.1%
Casting of iron and steel	..	789	..	..	..	..	..	..	..	..	..	..	152	346	..	..	..
Non-ferrous metals	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	452	0.0%
Fabricated metal products except machinery and equipment	7,314	11,446	6,981	5,026	4,608	4,208	6,418	4,383	8,911	5,791	12,579	5,132	14,128	7,320	7,330	6,061	0.6%
Machinery and equipment	63,111	72,578	55,766	62,824	24,056	21,468	24,884	17,248	21,640	23,272	24,128	21,341	30,109	33,399	40,789	33,195	3.1%
Computers and peripheral equipment	4,752	5,333	1,831	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Electrical equipment	27,375	20,826	8,658	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Consumer electronics and communication equipment	46,283	60,106	52,187	51,959	59,213	51,900	51,767	58,615	63,113	67,031	71,771	79,123	99,044	114,427	102,632	128,374	12.0%
Precision instruments and optical products; photographic equipment	204,869	137,323	117,795	93,030	122,818	132,235	144,412	117,320	110,712	99,125	137,328	138,726	97,674	75,140	64,630	83,530	7.8%
Motor vehicles and parts	3,363	2,951	5,845	2,526	4,717	3,518	7,295	2,615	2,229	3,665	..	4,442	..	1,988	3,482	18,054	1.7%
Other transport equipment	..	..	..	1,605	1,113	..	..	..	..	..	..	..	..	..	..	..	..
Shipbuilding	..	..	..	..	..	..	1,861	..	..	..	3,221	2,628	..	..	..	..	..
Aerospace	..	..	..	..	..	..	..	..	12,907	..	..	3,325	3,215	3,329	6,754	6,219	0.6%
Other manufactured goods	2,088	1,173	1,584	1,055	3,020	1,032	1,444	1,023	9,171	16,437	24,163	28,371	25,854	39,362	41,471	21,905	2.0%
Sewerage, waste management, remediation activities ²	..	..	..	..	..	40	126	40	..	..	..	..	..	..	..	..	..
Services																	
Wholesale and retail trade	2,038	4,167	1,847	3,009	3,163	4,881	878	6,101	7,788	11,804	11,707	9,353	6,043	8,278	11,252	18,449	1.7%
Transport and storage, incl. postal and courier activities	..	..	..	..	359	..	..	..	..	439	3,469	..	740	..	..	..	..
Telecommunications	..	..	..	..	12,881	..	..	..	5,136	1,664	2,782	..	1,782	1,541	10,866	6,336	0.6%
Miscellaneous business activities; Technical testing and analysis	13,540	18,355	12,602	13,874	23,118	15,261	17,713	35,245	36,111	42,405	48,039	59,359	79,608	144,603	134,604	137,991	12.9%
Computer programming and information services activities ⁷	22,130	24,277	27,681	32,351	33,976	29,762	29,312	34,304	38,058	35,581	50,079	76,212	70,659	76,863	88,526	40,264	3.8%
Software development ⁷	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	38,695	3.6%
Research and development services	20,826	24,796	22,798	12,516	11,595	6,199	7,326	27,720	34,063	49,614	59,601	38,879	46,542	47,873	58,555	62,560	5.8%
Public administration	..	2,034	1,320	2,758	2,456	4,002	3,167	908	..	4,115	4,291	3,008	17,964	..	..	..	..
Other Sectors																	
Agriculture, hunting and forestry; Fishing	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6,390	8,254	0.8%
Extractive Industries	15,316	23,506	19,105	15,456	22,459	22,863	36,092	38,641	60,261	42,412	59,208	35,985	60,697	50,447	39,261	66,781	6.2%
Electricity, gas and water supply	..	..	..	..	..	..	..	..	..	..	..	..	..	30,774	19,658	21,309	2.0%
Sewerage, waste management, remediation activities	..	..	..	..	..	..	..	..	..	..	..	..	..	715	737	286	0.0%
Construction	..	..	1,369	1,967	1,337	391	565	..	1,119	385	1,563	9,964	..	..	12,353	17,732	1.7%
Grand Total	702,177	672,895	573,436	544,142	624,041	549,893	632,566	628,931	706,895	680,633	755,408	752,742	836,580	985,258	974,115	1,072,134	100.0%

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.

3. r denotes revised figures.

4. .. denotes disclosive value.

5. - denotes nil. figures unavailable or too small to display.

6. Totals may not sum due to rounding

7. Prior to 2016 Software development was included in Computer programming and information services activities

Table 3
Current and capital expenditure on R&D performed within businesses in Scotland:
2001 to 2016¹

	£ thousands															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Capital total	54,202	34,621	20,569	31,116	40,739	33,175	31,589	34,052	50,185	45,121	42,670	38,372	42,110	91,677	64,792	93,591
of which:																
Land and buildings	19,833	11,235	2,538	4,104	9,029	6,842	5,101	5,630	10,945	5,372	7,782	4,987	7,590	13,242	9,140	17,816
Plant and machinery	34,369	23,386	18,030	27,012	31,710	26,333	26,488	28,423	39,240	39,749	34,888	33,385	34,520	78,434	55,652	75,775
Current total	462,467	472,088	420,696	399,262	465,720	427,080	511,007	519,458	580,980	573,697	654,028	670,289	758,933	865,403	887,834	978,544
of which:																
Salaries and wages	217,373	229,791	219,788	224,042	259,707	220,549	268,298	273,265	292,642	321,573	335,641	365,657	416,374	510,606	532,606	545,707
Other	245,094	242,298	200,908	175,221	206,013	206,531	242,708	246,193	288,338	252,124	318,387	304,633	342,558	354,797	355,228	432,837
Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. r denotes revised figures.

3. Totals may not sum due to rounding.

Table 4 (2014)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2014^{r,2}

	£ thousands				
	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	47,573	256,473	217,231	473,705	521,278
Chemicals	10,949	80,981	66,911	147,892	158,840
Mechanical engineering	2,602	19,826	17,126	36,953	39,555
Electrical machinery	26,433	87,195	59,837	147,032	173,465
Transport equipment & aerospace	471	2,806	3,404	6,210	6,681
Other manufacturing	7,117	65,665	69,954	135,619	142,736
Services	31,280	205,892	95,395	301,288	332,568
Other Sectors	12,823	48,241	42,170	90,411	103,234
Agriculture, hunting & forestry; Fishing	..	..	..	..	..
Extractive industries	4,777	27,754	16,474	44,227	49,005
Electricity, gas & waste supply; waste management ³	7,683	12,555	10,351	22,905	30,588
Construction	..	..	..	..	..
Grand Total	91,677	510,606	354,797	865,403	957,080

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum due to rounding.

Table 4 (2015)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2015^{r,2}

£ thousands					
	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	30,253	268,109	216,776	484,885	515,138
Chemicals	4,869	89,977	72,595	162,572	167,441
Mechanical engineering	3,060	24,802	19,196	43,998	47,058
Electrical machinery	15,411	78,626	61,114	139,740	155,152
Transport equipment & aerospace	653	5,204	5,833	11,037	11,689
Other manufacturing	6,259	69,499	58,039	127,539	133,798
Services	30,124	223,773	106,923	330,695	360,819
Other Sectors	4,415	40,724	31,529	72,253	76,669
Agriculture, hunting & forestry; Fishing	531	..	..	5,717	6,249
Extractive industries	2,551	24,834	11,009	35,844	38,395
Electricity, gas & waste supply; waste management ³	1,314	10,147	8,485	18,631	19,945
Construction	19	..	..	12,061	12,080
Grand Total	64,792	532,606	355,228	887,834	952,626

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum due to rounding.

Table 4 (2016)
Current and capital expenditure on R&D performed within businesses in Scotland:
Broad Product Groups, 2016¹

	£ thousands				
	Capital Expenditure	Current Expenditure			Total
		Salaries and Wages	Other	Total	
Manufacturing	50,609	259,366	281,936	541,302	591,911
Chemicals	8,256	69,052	89,409	158,461	166,716
Mechanical engineering	2,789	19,316	17,150	36,467	39,256
Electrical machinery	25,436	97,343	89,376	186,720	212,155
Transport equipment & aerospace	1,588	11,246	13,250	24,496	26,084
Other manufacturing	12,540	62,408	72,750	135,159	147,699
Services	31,207	229,091	105,564	334,654	365,861
Other Sectors	11,774	57,250	45,337	102,587	114,362
Agriculture, hunting & forestry; Fishing	736	2,625	4,892	7,518	8,254
Extractive industries	3,572	40,143	23,066	63,209	66,781
Electricity, gas & waste supply; waste management ³	6,659	8,900	6,036	14,937	21,595
Construction	807	5,581	11,343	16,924	17,732
Grand Total	93,591	545,707	432,837	978,544	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

6. Totals may not sum due to rounding.

Table 5 (2014)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2014^{r,2}

	Current Expenditure			£ thousands
	Basic Research	Applied Research	Experimental Development	Total
Manufacturing	7,497	165,200	301,007	473,705
Chemicals	..	32,826	..	147,892
Mechanical engineering	1,023	21,219	14,711	36,953
Electrical machinery	1,010	48,202	97,821	147,032
Transport equipment & aerospace	..	2,590	..	6,210
Other manufacturing	4,751	60,364	70,504	135,619
Services	47,931	149,286	104,071	301,288
Other Sectors	6,759	54,051	29,601	90,411
Agriculture, hunting & forestry; Fishing	..	..	..	..
Extractive industries	4,342	34,689	5,197	44,227
Electricity, gas & water supply; waste management ³	705	6,020	16,180	22,905
Construction	..	..	..	..
Grand Total	62,187	368,537	434,679	865,403

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

Table 5 (2015)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2015^{r,2}

	Current Expenditure			£ thousands
	Basic Research	Applied Research	Experimental Development	Total
Manufacturing	9,632	163,450	311,803	484,885
Chemicals	983	37,639	123,951	162,572
Mechanical engineering	2,158	23,669	18,170	43,998
Electrical machinery	1,049	41,237	97,455	139,740
Transport equipment & aerospace	526	3,925	6,585	11,037
Other manufacturing	4,917	56,980	65,642	127,539
Services	50,075	163,262	117,359	330,695
Other Sectors	10,450	44,483	17,320	72,253
Agriculture, hunting & forestry; Fishing	1	4,010	1,707	5,717
Extractive industries	4,843	27,485	3,516	35,844
Electricity, gas & water supply; waste management ³	1,546	8,651	8,434	18,631
Construction	4,060	4,337	3,664	12,061
Grand Total	70,157	371,195	446,482	887,834

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

Table 5 (2016)
Current expenditure on R&D performed within business in Scotland:
Broad Product Groups, 2016¹

	Full time equivalent			Total
	Current Expenditure			
	Basic Research	Applied Research	Experimental Development	
Manufacturing	14,677	267,446	259,178	541,302
Chemicals	2,528	58,033	97,899	158,461
Mechanical engineering	2,414	18,308	15,745	36,467
Electrical machinery	852	108,704	77,164	186,720
Transport equipment & aerospace	960	16,938	6,598	24,496
Other manufacturing	7,923	65,463	61,772	135,159
Services	56,887	159,245	118,522	334,654
Other Sectors	5,795	59,958	36,834	102,587
Agriculture, hunting & forestry; Fishing	..	..	5,253	7,518
Extractive industries	3,709	49,711	9,789	63,209
Electricity, gas & water supply; waste management ²	..	..	13,127	14,937
Construction	1,266	6,994	8,664	16,924
Grand Total	77,360	486,650	414,534	978,544

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.
3. .. Denotes disclosive value.
4. - denotes nil. Figures unavailable or too small to display.

Table 6 (2014)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2014^{r,2}

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	27,733	53,887	81,620
Chemicals	..	6,904	..
Mechanical engineering	4,202	1,817	6,019
Electrical machinery	..	38,482	..
Transport equipment & aerospace	535	180	714
Other manufacturing	10,670	6,504	17,174
Services	5,708	12,073	17,781
Other Sectors	4,936	5,673	10,609
Agriculture, hunting & forestry; Fishing	..	..	..
Extractive industries	..	..	..
Electricity, gas & water supply; waste management ³	..	..	..
Construction	709	3	712
Grand Total	38,377	71,632	110,009

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

6. Totals may not sum to rounding.

Table 6 (2015)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2015^{r,2}

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	6,819	46,021	52,840
Chemicals	..	..	3,486
Mechanical engineering	1,476	2,719	4,196
Electrical machinery	3,193	38,535	41,728
Transport equipment & aerospace	..	..	608
Other manufacturing	1,260	1,562	2,822
Services	10,895	8,068	18,962
Other Sectors	3,503	4,257	7,760
Agriculture, hunting & forestry; Fishing	2,148	1,291	3,439
Extractive industries	..	..	..
Electricity, gas & water supply; waste management ³	..	..	..
Construction	725	3	729
Grand Total	21,217	58,345	79,562

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.
6. Totals may not sum to rounding.

Table 6 (2016)
Extramural expenditure on R&D by businesses performing R&D in Scotland:
Broad Product Groups, 2016¹

	£ thousands		
	United Kingdom	Overseas	Total
Manufacturing	17,286	144,554	161,839
Chemicals	708	2,493	3,201
Mechanical engineering	4,682	4,837	9,519
Electrical machinery	216	133,446	133,662
Transport equipment & aerospace	373	424	797
Other manufacturing	11,307	3,354	14,660
Services	14,790	19,943	34,733
Other Sectors	5,524	3,624	9,148
Agriculture, hunting & forestry; Fishing	1,952	1,261	3,213
Extractive industries	2,905	1,425	4,330
Electricity, gas & water supply; waste management ²	..	..	..
Construction	..	..	..
Grand Total	37,600	168,120	205,720

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. .. denotes disclosive value.
4. - denotes nil, figures unavailable or too small to display.
5. Totals may not sum to rounding.

Table 7
Sources of funds for R&D performed within businesses in Scotland:
2001 to 2016

	£ thousands															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Government	43,406	18,313	17,531	25,197	33,184	32,237	54,705	42,590	56,313	56,681	56,205	68,981	70,040	73,699	61,163	74,031
Overseas total	87,683	55,399	51,007	92,876	112,310	107,117	137,725	117,880	193,502	183,991	152,968	122,048	149,240	199,482	129,001	143,552
of which:																
European Commission grants	2,864	4,326	2,148	422	504	526	605	1,206	1,217	2,493	2,865	2,179	2,165	1,396	1,983	3,607
Other Overseas	84,819	51,073	48,859	92,454	111,806	106,592	137,120	116,674	192,286	181,498	150,103	119,869	147,074	198,086	127,018	139,945
Other UK Business	92,907	99,447	93,765	91,068	111,669	70,575	67,574	49,902	15,635	19,320	11,173	6,753	15,023	16,294	16,296	20,766
Own funds	292,454	333,461	278,889	221,169	249,254	250,291	282,431	342,994	365,632	358,759	473,561	507,053	562,444	663,192	737,032	825,025
Other⁴	219	90	71	69	43	34	162	143	83	67	2,791	3,826	4,297	4,413	9,133	8,760
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134

	Percentages															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Government	8	4	4	6	7	7	10	8	9	9	8	10	9	8	6	7
Overseas total	17	11	12	22	22	23	25	21	31	30	22	17	19	21	14	13
of which:																
European Commission grants	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Overseas	16	10	11	21	22	23	25	21	30	29	22	17	18	21	13	13
Other UK Business	18	20	21	21	22	15	12	9	2	3	2	1	2	2	2	2
Own funds	57	66	63	51	49	54	52	62	58	58	68	72	70	69	77	77
Other⁴	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. .. denotes disclosive value
3. Totals may not sum due to rounding
4. 'Other' includes funds from other UK businesses, UK Private Non-Profit organisations and Higher Education establishments, and from 2011, international organisations.

Table 8 (2014)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2014^{r,2}

					£ thousands
Scotland	Government	Overseas	Own Funds	Other UK Business ⁶	Total
Manufacturing	44,366	125,791	341,657	9,465	521,278
Chemicals	390	..	..	..	158,840
Mechanical engineering	3,082	6,660	29,007	806	39,555
Electrical machinery	13,258	..	..	..	173,465
Transport equipment & Aerospace	1,615	606	4,236	225	6,681
Other manufacturing	26,021	16,876	99,080	759	142,736
Services	28,162	53,048	242,298	9,059	332,568
Other Sectors	1,170	20,643	79,238	2,183	103,234
Agriculture, hunting & forestry; Fishing	..	..	..	..	..
Extractive industries	881	10,885	37,186	53	49,005
Electricity, gas & water; waste management ³	125	8,337	20,794	1,333	30,588
Construction	..	..	..	..	..
Grand Total	73,699	199,482	663,192	20,707	957,080

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SCI 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display
6. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
7. Totals may not sum due to rounding.

Table 8 (2015)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2015^{r,2}

					£ thousands
Scotland	Government	Overseas	Own Funds	Other UK Business ⁶	Total
Manufacturing	31,361	73,587	401,354	8,836	515,138
Chemicals	..	16,374	150,615	..	167,441
Mechanical engineering	2,409	7,996	35,068	1,586	47,058
Electrical machinery	..	38,072	101,893	..	155,152
Transport equipment & Aerospace	2,471	2,433	6,172	613	11,689
Other manufacturing	16,897	8,711	107,606	584	133,798
Services	29,184	45,606	271,026	15,003	360,819
Other Sectors	618	9,809	64,652	1,590	76,669
Agriculture, hunting & forestry; Fishing	117	866	4,969	297	6,249
Extractive industries	353	7,428	30,602	12	38,395
Electricity, gas & water; waste management ³	81	1,432	17,499	934	19,945
Construction	68	82	11,582	347	12,080
Grand Total	61,163	129,001	737,032	25,429	952,626

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SCI 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display
6. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
7. Totals may not sum due to rounding.

Table 8 (2016)
Sources of funds for R&D performed within businesses in Scotland:
Broad Product Groups, 2016¹

					£ thousands
Scotland	Government	Overseas	Own Funds	Other UK Business ⁶	Total
Manufacturing	35,849	85,381	460,005	10,676	591,911
Chemicals	440	18,596	146,999	681	166,716
Mechanical engineering	2,118	7,520	28,771	847	39,256
Electrical machinery	..	46,977	146,919	..	212,155
Transport equipment & Aerospace	..	1,425	22,433	..	26,084
Other manufacturing	16,866	10,862	114,883	5,088	147,699
Services	28,625	35,072	285,342	16,822	365,861
Other Sectors	9,557	23,099	79,678	2,028	114,362
Agriculture, hunting & forestry; Fishing	..	..	7,136	7	8,254
Extractive industries	24	21,375	45,380	2	66,781
Electricity, gas & water; waste management ²	..	..	10,379	1,543	21,595
Construction	452	20	16,784	476	17,732
Grand Total	74,031	143,552	825,025	29,526	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SCI 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. .. denotes disclosive value.
4. - denotes nil, figures unavailable or too small to display
5. Figures for other UK Business includes funds from other sources and Higher Education Establishments and, from 2011, international organisations.
6. Totals may not sum due to rounding.

Table 9
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area Level, 2001 to 2016

	£ thousands																% of 2016 total	Per head of population (£), 2016
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016		
Aberdeen City	22,992	29,977	27,918	26,186	36,724	37,507	52,983	54,024	44,094	35,462	71,174	66,222	106,741	158,449	158,121	164,719	15.4%	717
Aberdeenshire	4,660	6,263	4,687	4,435	7,329	5,818	6,671	9,957	34,752	29,071	33,964	19,605	16,696	22,270	19,716	29,061	2.7%	111
Angus	802	..	1,538	2,145	1,960	1,474	2,524	1,240	1,889	3,197	2,155	2,306	2,359	2,977	3,092	3,703	0.3%	32
Argyll & Bute	1,231	1,001	874	..	561	477	525	1,556	1,552	2,423	2,948	..	..	..	1,482	..	..	..
Clackmannanshire	..	..	..	..	716	658	931	191	..	771	2,941	..	520	2,174	1,964	2,464	0.2%	48
Dumfries & Galloway	990	1,791	3,387	1,706	2,264	2,980	3,107	1,972	1,875	2,791	4,534	4,860	4,953	4,964	4,907	5,777	0.5%	39
Dumfries City	46,474	55,485	40,048	48,807	42,208	42,197	43,414	45,143	43,708	33,585	35,046	34,894	35,161	35,020	40,913	59,233	5.5%	399
East Ayrshire	1,553	1,346	984	1,602	1,981	2,029	1,525	1,648	1,284	1,017	1,194	1,084	1,285	1,792	..	3,532	0.3%	29
East Dunbartonshire	749	1,150	1,202	774	772	1,010	..	363	..	..	1,119	1,392	1,151	1,213	1,866	2,180	0.2%	20
East Lothian	..	..	..	..	3,995	5,527	..	1,110	1,882	1,494	..	..	1,954	3,066	5,150	3,892	0.4%	37
East Renfrewshire	..	..	..	..	1,436	..	905	..	..	1,876	2,486	2,677	2,954	2,904	2,815	3,063	0.3%	33
City of Edinburgh	197,708	139,145	130,294	101,188	103,266	106,455	147,550	116,081	136,204	146,087	150,655	178,446	195,021	276,319	254,089	285,437	26.6%	563
Na h-Eileanan Siar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Falkirk	..	12,759	12,574	9,763	7,042	3,843	10,380	6,700	3,587	5,663	5,423	8,356	6,643	8,421	4,453	12,163	1.1%	76
Fife	11,361	13,874	9,631	19,998	23,741	18,029	20,074	22,048	19,716	26,605	27,993	31,170	27,208	23,233	24,284	28,829	2.7%	78
Glasgow City	12,918	19,322	17,167	25,279	25,770	23,724	23,924	31,357	43,897	40,797	66,272	59,829	82,834	77,230	89,387	109,459	10.2%	178
Highland	..	11,849	..	..	..	..	23,319	29,995	..	29,192	44,023	36,470	32,054	28,178	27,125	30,156	2.8%	128
Inverclyde	..	..	..	..	..	..	..	7,190	..	..	7,831	5,232	4,608	4,408	4,039	3,279	0.3%	41
Midlothian	6,787	23,497	21,292	3,587	2,386	1,775	11,295	19,831	16,609	17,076	13,048	12,554	19,208	29,996	25,204	23,662	2.2%	267
Moray	188	668	507	665	950	664	884	943	1,125	3,385	3,751	3,464	3,693	2,239	1,879	1,640	0.2%	17
North Ayrshire	2,466	696	770	1,803	856	934	2,556	1,805	2,988	2,339	2,771	3,756	3,016	3,123	4,346	5,035	0.5%	37
North Lanarkshire	43,465	54,954	49,382	46,656	65,526	64,103	73,209	80,281	108,208	93,304	48,898	58,115	53,080	62,465	63,883	77,169	7.2%	227
Orkney Islands	..	..	..	..	..	..	..	1,190	1,712	1,078	2,001	..	..	..	..	..	..	..
Perth & Kinross	586	779	524	668	990	956	1,297	720	1,331	1,993	4,318	4,833	2,110	10,689	8,110	8,469	0.8%	56
Renfrewshire	11,176	12,435	9,562	10,123	14,129	11,819	21,919	23,398	27,387	32,533	33,570	23,178	26,699	29,122	19,635	23,454	2.2%	133
Scottish Borders	1,474	1,222	1,317	4,458	1,436	1,913	12,148	4,783	4,564	7,052	5,835	7,571	6,927	5,977	7,160	7,303	0.7%	64
Shetland Islands	..	..	..	..	..	..	..	..	..	249	342	199	..	..	..	..	..	..
South Ayrshire	..	1,151	..	627	1,130	734	1,977	2,575	9,723	5,046	5,439	7,527	6,732	5,942	5,648	8,662	0.8%	77
South Lanarkshire	25,613	39,874	33,282	28,050	41,889	36,214	27,612	25,741	22,940	16,056	19,473	20,115	17,436	19,868	18,708	29,581	2.8%	93
Stirling	1,160	2,267	1,974	1,791	2,442	1,769	3,653	4,897	6,011	10,618	6,920	8,316	4,560	5,272	4,876	6,902	0.6%	74
West Dunbartonshire	..	4,423	..	2,460	3,192	2,530	2,196	2,453	3,041	..	5,137	3,752	8,193	5,571	10,451	2,997	0.3%	33
West Lothian	59,722	54,622	..	56,807	..	44,625	40,659	51,995	50,192	52,171	83,242	95,570	124,552	121,005	135,611	110,471	10.3%	613
Grand Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134	100.0%	198

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. .. Denotes disclosive value
3. - denotes nil, figures unavailable or too small to display

Table 10 (2014)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Main Sectors, 2014^r

	£ thousands			
	Manufacturing	Services	Other Sectors ²	Total
Aberdeen City	31,177	82,786	44,487	158,449
Aberdeenshire	6,384	13,149	2,738	22,270
Angus	2,362	..	..	2,977
Argyll & Bute	..	..	..	..
Clackmannanshire	..	382	..	2,174
Dumfries & Galloway	3,363	..	..	4,964
Dundee City	31,216	..	..	35,020
East Ayrshire	..	1,044	..	1,792
East Dunbartonshire	..	514	..	1,213
East Lothian	..	2,720	..	3,066
East Renfrewshire	..	..	..	2,904
City of Edinburgh	157,366	113,550	5,404	276,319
Na h-Eileanan Siar	..	..	..	..
Falkirk	..	5,793	..	8,421
Fife	12,919	8,070	2,243	23,233
Glasgow City	23,487	44,956	8,786	77,230
Highland	..	5,034	..	28,178
Inverclyde	4,165	..	..	4,408
Midlothian	..	8,187	..	29,996
Moray	1,238	..	..	2,239
North Ayrshire	1,666	..	..	3,123
North Lanarkshire	46,993	..	..	62,465
Orkney Islands	..	..	..	..
Perth & Kinross	1,038	..	..	10,689
Renfrewshire	11,884	..	..	29,122
Scottish Borders	3,639	..	..	5,977
Shetland Islands	..	..	..	..
South Ayrshire	4,407	..	..	5,942
South Lanarkshire	14,903	..	..	19,868
Stirling	..	2,026	..	5,272
West Dunbartonshire	1,130	..	..	5,571
West Lothian	..	12,173	..	121,005
Grand Total	521,278	332,568	103,234	957,080

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

Table 10 (2015)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Main Sectors, 2015^r

	£ thousands			
	Manufacturing	Services	Other Sectors ²	Total
Aberdeen City	46,775	74,783	36,564	158,121
Aberdeenshire	6,394	12,994	328	19,716
Angus	2,322	..	..	3,092
Argyll & Bute	..	827	..	1,482
Clackmannanshire	..	..	..	1,964
Dumfries & Galloway	3,594	..	..	4,907
Dundee City	29,724	..	..	40,913
East Ayrshire	..	..	..	..
East Dunbartonshire	1,130	..	..	1,866
East Lothian	..	4,171	..	5,150
East Renfrewshire	..	..	..	2,815
City of Edinburgh	134,459	114,309	5,321	254,089
Na h-Eileanan Siar	..	137	..	..
Falkirk	2,295	..	..	4,453
Fife	12,048	9,704	2,532	24,284
Glasgow City	24,155	57,524	7,708	89,387
Highland	..	4,371	..	27,125
Inverclyde	3,691	..	..	4,039
Midlothian	..	11,519	..	25,204
Moray	1,384	..	..	1,879
North Ayrshire	2,240	..	..	4,346
North Lanarkshire	47,089	..	..	63,883
Orkney Islands	..	..	..	..
Perth & Kinross	..	1,417	..	8,110
Renfrewshire	11,551	..	..	19,635
Scottish Borders	4,097	..	..	7,160
Shetland Islands	..	..	..	..
South Ayrshire	3,724	..	..	5,648
South Lanarkshire	13,546	..	..	18,708
Stirling	..	2,818	..	4,876
West Dunbartonshire	1,254	..	..	10,451
West Lothian	..	16,656	..	135,611
Grand Total	515,138	360,819	76,669	952,626

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

Table 10 (2016)
Expenditure on R&D performed within businesses in Scotland:
Local Authority Area by Main Sectors, 2016

	£ thousands			
	Manufacturing	Services	Other Sectors ²	Total
Aberdeen City	21,715	73,718	69,286	164,719
Aberdeenshire	10,481	14,769	3,811	29,061
Angus	2,836	..	..	3,703
Argyll & Bute	..	..	..	..
Clackmannanshire	..	..	..	2,464
Dumfries & Galloway	3,605	1,983	188	5,777
Dundee City	55,556	..	..	59,233
East Ayrshire	2,617	..	..	3,532
East Dunbartonshire	1,494	..	..	2,180
East Lothian	..	3,082	..	3,892
East Renfrewshire	..	..	..	3,063
City of Edinburgh	176,197	103,446	5,794	285,437
Na h-Eileanan Siar	..	..	..	..
Falkirk	10,524	..	..	12,163
Fife	17,630	..	..	28,829
Glasgow City	31,128	76,099	2,232	109,459
Highland	24,186	..	..	30,156
Inverclyde	..	..	..	3,279
Midlothian	..	9,765	..	23,662
Moray	1,374	..	..	1,640
North Ayrshire	2,525	..	..	5,035
North Lanarkshire	61,648	..	..	77,169
Orkney Islands	..	..	..	..
Perth & Kinross	..	1,805	..	8,469
Renfrewshire	15,006	..	..	23,454
Scottish Borders	4,992	..	..	7,303
Shetland Islands	..	..	..	..
South Ayrshire	6,383	..	..	8,662
South Lanarkshire	13,892	..	..	29,581
Stirling	2,418	3,382	1,102	6,902
West Dunbartonshire	1,687	..	..	2,997
West Lothian	84,605	25,277	589	110,471
Grand Total	591,911	365,861	114,362	1,072,134

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. From 2009 onwards. Waste management is included in Other Sectors, when previously it was included in Manufacturing.
3. .. Denotes disclosive value
4. - denotes nil. figures unavailable or too small to display.
5. Totals may not sum due to rounding.

Table 11
Expenditure on R&D performed in businesses by Government Office Region:
Per head of population, 2016

	BERD (£ millions)	BERD per head of population £	BERD as a percentage of GDP	Percentage of UK BERD
East of England	4,393	717	2.59%	19.8%
South East	4,693	520	1.58%	21.1%
West Midlands	2,303	397	1.58%	10.4%
East Midlands	1,655	350	1.44%	7.4%
North West	2,346	325	1.23%	10.6%
South West	1,500	272	1.02%	6.7%
London	2,296	261	0.49%	10.3%
Northern Ireland	481	258	1.12%	2.2%
Scotland	1,072	198	0.72%	4.8%
Wales	435	140	0.64%	2.0%
Yorkshire and the Humber	750	138	0.58%	3.4%
North East	302	114	0.52%	1.4%
UK	22,224	339	1.12%	100.0%

Source: ONS and Scottish Government

Notes:

1. Ranked by BERD per head of population.
2. Totals may not sum due to rounding.

Table 12
Expenditure on R&D performed in businesses by Government Office Region:
Current prices & as a percentage of GDP, 2001 to 2016¹

	Business R&D Expenditure (£million)																% of total 2016
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016	
East of England	2,798	2,650	2,915	2,672	3,718	3,650	3,992	4,182	3,812	3,846	3,639	3,606	4,137	4,094	4,200	4,393	19.8%
West Midlands	760	774	794	758	721	915	995	886	847	886	1,281	1,460	1,684	1,924	2,159	2,303	10.4%
South East	3,212	3,156	3,266	3,125	3,125	3,347	3,515	3,466	3,758	3,798	4,579	4,133	4,288	4,609	4,765	4,693	21.1%
East Midlands	909	974	862	936	1,006	985	1,062	976	992	1,137	1,146	1,218	1,340	1,473	1,531	1,655	7.4%
North West	1,582	1,604	1,538	1,739	1,892	1,623	2,021	2,130	1,926	2,074	2,220	1,781	1,835	1,913	2,116	2,346	10.6%
Northern Ireland	150	149	116	120	148	157	177	171	297	324	352	415	441	359	501	481	2.2%
South West	1,006	1,158	1,221	1,296	1,201	1,232	1,229	1,345	1,349	1,454	1,359	1,367	1,450	1,561	1,476	1,500	6.7%
Scotland	517	507	441	430	506	460	543	554	631	619	697	709	801	957	953	1,072	4.8%
Wales	161	187	200	226	232	216	308	243	243	234	252	268	367	386	368	435	2.0%
Yorkshire and the Humber	319	337	335	343	344	384	436	433	454	488	550	600	660	700	769	750	3.4%
North East	125	124	149	257	289	292	331	318	315	308	259	282	323	282	306	302	1.4%
London	700	865	669	759	552	882	1,067	1,109	907	877	1,118	1,570	1,291	1,724	1,892	2,296	10.3%
UK	12,239	12,484	12,505	12,662	13,734	14,144	15,676	15,814	15,532	16,045	17,452	17,409	18,617	19,982	21,038	22,224	100.0%

	% of GDP ²															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
East of England	2.76%	2.50%	2.59%	2.30%	3.00%	2.82%	2.99%	3.10%	2.90%	2.82%	2.64%	2.53%	2.76%	2.61%	2.59%	2.59%
West Midlands	0.86%	0.84%	0.83%	0.75%	0.68%	0.83%	0.88%	0.79%	0.78%	0.77%	1.07%	1.18%	1.30%	1.43%	1.55%	1.58%
South East	1.84%	1.71%	1.69%	1.57%	1.49%	1.52%	1.54%	1.48%	1.63%	1.57%	1.85%	1.61%	1.60%	1.66%	1.66%	1.58%
East Midlands	1.33%	1.36%	1.15%	1.19%	1.20%	1.12%	1.16%	1.07%	1.11%	1.21%	1.19%	1.22%	1.28%	1.36%	1.38%	1.44%
North West	1.39%	1.33%	1.21%	1.30%	1.34%	1.08%	1.30%	1.39%	1.25%	1.29%	1.38%	1.07%	1.06%	1.08%	1.15%	1.23%
Northern Ireland	0.56%	0.54%	0.39%	0.39%	0.44%	0.45%	0.48%	0.48%	0.84%	0.90%	0.96%	1.09%	1.13%	0.90%	1.22%	1.12%
South West	1.15%	1.26%	1.27%	1.28%	1.12%	1.11%	1.06%	1.15%	1.16%	1.19%	1.11%	1.07%	1.10%	1.13%	1.06%	1.02%
Scotland	0.60%	0.56%	0.46%	0.42%	0.47%	0.40%	0.45%	0.45%	0.51%	0.50%	0.54%	0.54%	0.59%	0.67%	0.66%	0.72%
Wales	0.39%	0.43%	0.44%	0.47%	0.46%	0.40%	0.56%	0.45%	0.46%	0.42%	0.43%	0.45%	0.59%	0.61%	0.56%	0.64%
Yorkshire and the Humber	0.40%	0.39%	0.37%	0.36%	0.34%	0.36%	0.39%	0.40%	0.42%	0.44%	0.49%	0.52%	0.56%	0.58%	0.61%	0.58%
North East	0.35%	0.32%	0.37%	0.59%	0.62%	0.60%	0.67%	0.64%	0.64%	0.61%	0.50%	0.53%	0.60%	0.50%	0.53%	0.52%
London	0.30%	0.35%	0.26%	0.28%	0.19%	0.28%	0.31%	0.32%	0.27%	0.25%	0.30%	0.41%	0.32%	0.40%	0.43%	0.49%
UK	1.08%	1.04%	0.99%	0.96%	0.97%	0.95%	1.01%	1.02%	1.01%	1.00%	1.06%	1.02%	1.05%	1.08%	1.11%	1.12%

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data from 2001 onwards with earlier years due to a government agency reclassification.
2. Market price GDP for Scotland sourced from Quarterly National Accounts Scotland. Market price GDP for other UK regions estimated based on the UK GVA (Balanced) to GDP ratio.
3. r denotes revised figures
4. Ranked by percentage of GDP 2016
5. Totals may not sum due to rounding.

Table 13
Expenditure on R&D performed within businesses in Scotland by Broad Industry Group:
2009 to 2016

Industry Group (SIC 2007 Section(s) ²)	£ thousands							
	Year							
	2009	2010	2011	2012	2013	2014	2015	2016
Non-Manufacturing Production (ABDE)	57,705	49,940	64,123	36,057	72,201	60,566	48,607	90,460
Manufacturing (C)	251,259	234,176	256,533	274,488	263,164	262,678	265,387	333,636
Construction (F)	963	350	1,441	2,859	2,483	5,701	3,234	6,549
Wholesale and retail trade; Repair of motor vehicles and motorcycles (G)	72,480	83,489	29,235	8,702	3,879	6,769	8,738	13,504
Transportation & Storage and Accommodation & Food Service Activities (HI)	2,128	1,728	5,373	2,330	2,203	3,401	4,604	6,592
Information and communication (J)	38,243	33,691	51,650	72,634	80,248	82,997	107,758	155,817
Financial & Insurance Activities and Real Estate Activities (KL)	..	..	3,744	4,007	14,519	65,769	57,558	52,260
Professional, scientific and technical activities (M)	193,824	197,850	270,380	294,321	350,054	453,672	433,179	383,680
Administrative and support service activities (N)	10,755	10,276	8,475	8,046	7,762	9,964	18,171	23,705
Public Administration, Education and Health (OPQ)	..	..	1,657	936	1,357	951	2,624	1,296
Arts, Entertainment & Recreation and Other Service Activities (RS)	1,631	4,141	4,086	4,282	3,172	4,612	2,766	4,635
Total	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134

Source: ONS and Scottish Government

Notes:

1. .. Denotes disclosive value.
2. Standard Industrial Classification 2007
3. Totals may not sum due to rounding.

Table 14
Employment on R&D performed within businesses in Scotland:
2001 to 2016

	Full time equivalent															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	4,152	4,116	3,725	3,528	3,629	3,486	3,860	3,623	4,071	4,310	3,967	4,516	4,948	5,304	5,531	6,548
Technicians, laboratory assistants and draughtsmen	1,294	1,373	1,075	1,202	1,288	1,297	1,527	1,829	1,752	1,843	2,413	2,405	3,004	3,781	4,377	3,430
Administrative, clerical industrial and other staff	1,764	1,780	1,652	1,682	1,621	1,526	1,538	1,251	1,201	1,319	1,430	1,421	1,710	1,829	1,956	1,964
Grand Total	7,210	7,269	6,452	6,412	6,537	6,309	6,926	6,703	7,024	7,472	7,810	8,342	9,662	10,914	11,864	11,943

	Percentages															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	58	57	58	55	56	55	56	54	58	58	51	54	51	49	47	55
Technicians, laboratory assistants and draughtsmen	18	19	17	19	20	21	22	27	25	25	31	29	31	35	37	29
Administrative, clerical industrial and other staff	24	24	26	26	25	24	22	19	17	18	18	17	18	17	16	16
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. Totals may not sum due to rounding

Table 15 (2014)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2014^{r,2}

	Full time equivalent			
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	R&D Employment
Manufacturing	2,439	1,487	1,048	4,974
Chemicals	474	475	552	1,501
Mechanical engineering	253	213	182	648
Electrical machinery	1,038	308	94	1,441
Transport equipment & aerospace	57	31	10	98
Other manufacturing	618	459	209	1,286
Services	2,380	2,163	595	5,138
Other Sectors	484	131	187	802
Agriculture, hunting & forestry; Fishing	18	13	13	44
Extractive industries	191	62	59	312
Electricity, gas & water supply; waste management ³	127	31	36	195
Construction	147	25	78	251
Grand Total	5,304	3,781	1,829	10,914

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.

3. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value.

5. - denotes nil. Figures unavailable or too small to display.

Table 15 (2015)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2015^{r,2}

	Full time equivalent			
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	R&D Employment
Manufacturing	2,553	1,716	1,030	5,299
Chemicals	520	532	549	1,601
Mechanical engineering	255	167	153	575
Electrical machinery	1,035	382	70	1,487
Transport equipment & aerospace	76	49	16	142
Other manufacturing	666	586	242	1,494
Services	2,421	2,545	600	5,565
Other Sectors	558	116	326	1,000
Agriculture, hunting & forestry; Fishing	32	23	22	77
Extractive industries	137	52	48	237
Electricity, gas & water supply; waste management ³	71	20	76	167
Construction	317	22	180	519
Grand Total	5,531	4,377	1,956	11,864

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.
3. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil. Figures unavailable or too small to display.

Table 15 (2016)
Employment on R&D performed within businesses in Scotland
Broad Product Groups, 2016¹

	Full time equivalent			R&D Employment
	Scientists and Engineers	Technicians, Laboratory Assistants and Draughtsmen	Administrative, Clerical and Other	
Manufacturing	3,540	1,354	1,115	6,009
Chemicals	799	459	482	1,740
Mechanical engineering	261	170	162	593
Electrical machinery	1,368	153	93	1,615
Transport equipment & aerospace	169	83	70	321
Other manufacturing	943	489	307	1,739
Services	2,432	1,865	591	4,888
Other Sectors	576	210	259	1,045
Agriculture, hunting & forestry; Fishing	30	24	27	81
Extractive industries	361	115	81	556
Electricity, gas & water supply; waste management ²	92	23	21	137
Construction	93	49	130	271
Grand Total	6,548	3,430	1,964	11,943

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007 see Note 16 of the background notes for details.
2. From 2009 onwards. Waste management is included in Electricity, gas and water supply; waste management, when previously it was included in Other manufacturing.
3. .. Denotes disclosive value.
4. - denotes nil. Figures unavailable or too small to display.

Table 16 (2014)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2014^{r,2}

	£ thousands		
Scotland	Civil	Defence	Total
Manufacturing	..	..	521,278
Chemicals	158,840	-	158,840
Mechanical engineering	32,555	7,000	39,555
Electrical machinery	..	..	173,465
Transport equipment & aerospace	4,849	1,832	6,681
Other manufacturing	..	..	142,736
Services	..	..	332,568
Other Sectors	..	-	103,234
Agriculture, hunting & forestry; Fishing	..	-	..
Extractive industries	49,005	-	49,005
Electricity, gas & water supply; waste management ³	30,588	-	30,588
Construction	..	-	..
Grand Total	883,569	73,510	957,080

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

Table 16 (2015)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2015^{r,2}

Scotland	£ thousands		
	Civil	Defence	Total
Manufacturing	458,715	56,423	515,138
Chemicals	167,441	-	167,441
Mechanical engineering	40,328	6,730	47,058
Electrical machinery	..	..	155,152
Transport equipment & aerospace	7,272	4,417	11,689
Other manufacturing	..	..	133,798
Services	358,151	2,668	360,819
Other Sectors	76,669	-	76,669
Agriculture, hunting & forestry; Fishing	6,249	-	6,249
Extractive industries	38,395	-	38,395
Electricity, gas & water supply; waste management ³	19,945	-	19,945
Construction	12,080	-	12,080
Grand Total	893,534	59,092	952,626

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

Table 16 (2016)
Expenditure on civil and defence R&D performed within businesses in Scotland:
Broad Product Groups, 2016²

			£ thousands
Scotland	Civil	Defence	Total
Manufacturing	522,088	69,823	591,911
Chemicals	166,716	-	166,716
Mechanical engineering	34,484	4,772	39,256
Electrical machinery	..	..	212,155
Transport equipment & aerospace	..	..	26,084
Other manufacturing	110,526	37,173	147,699
Services	..	..	365,861
Other Sectors	..	..	114,362
Agriculture, hunting & forestry; Fishing	8,254	-	8,254
Extractive industries	66,781	-	66,781
Electricity, gas & water supply; waste management ³	21,595	-	21,595
Construction	..	..	17,732
Grand Total	998,916	73,219	1,072,134

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

Table 17
Employment on civil and defence R&D performed within businesses in Scotland:
2001 to 2016

	Full time equivalent															
Civil	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	3,532	3,833	3,446	3,224	3,292	3,131	3,393	3,264	3,660	3,880	3,872	4,407	4,751	5,082	5,287	6,295
Technicians, laboratory assistants & draughtsman	1,189	1,301	1,026	1,127	1,225	1,248	1,467	1,762	1,689	1,784	2,351	2,364	2,926	3,647	4,186	3,262
Admin, Clerical industrial & Other staff	1,688	1,695	1,626	1,659	1,588	1,503	1,513	1,215	1,157	1,273	1,415	1,399	1,655	1,748	1,863	1,867
Grand Total	6,409	6,830	6,098	6,011	6,105	5,882	6,372	6,241	6,507	6,937	7,638	8,170	9,332	10,477	11,336	11,424

	Percentages															
Civil	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	55	56	57	54	54	53	53	52	56	56	51	54	51	49	47	55
Technicians, laboratory assistants & draughtsman	19	19	17	19	20	21	23	28	26	26	31	29	31	35	37	29
Admin, Clerical industrial & Other staff	26	25	27	28	26	26	24	19	18	18	19	17	18	17	16	16
Grand Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

	Full time equivalent															
Defence	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	620	283	279	303	336	355	468	358	411	430	95	109	197	222	245	253
Technicians, laboratory assistants & draughtsman	106	71	49	75	63	49	60	68	63	59	62	41	78	134	191	168
Admin, Clerical industrial & Other staff	76	85	27	22	33	23	25	36	44	46	15	22	55	81	93	98
Grand Total	801	439	354	401	432	427	553	462	517	534	172	172	330	437	528	519

	Percentages															
Defence	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scientist and engineers	77	64	79	76	78	83	85	78	79	80	55	63	60	51	46	49
Technicians, laboratory assistants & draughtsman	13	16	14	19	15	11	11	15	12	11	36	24	24	31	36	32
Admin, Clerical industrial & Other staff	9	19	8	6	8	5	5	8	8	9	9	13	17	19	18	19
Grand Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: ONS and Scottish Government

- Notes:
1. r denotes revised figures
2. Totals may not sum due to rounding

Table 18 (2014)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2014^{r,2}

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	36,943	181,841	302,494	521,278
Chemicals	..	25,332	..	158,840
Mechanical engineering	13,435	11,750	14,369	39,555
Electrical machinery	6,352	111,066	56,047	173,465
Transport equipment & aerospace	..	1,345	..	6,681
Other manufacturing	12,171	32,348	98,218	142,736
Services	117,390	38,399	176,779	332,568
Other Sectors	1,635	11,540	90,058	103,234
Agriculture, hunting & forestry; Fishing	..	..	..	..
Extractive industries	..	..	46,688	49,005
Electricity, gas & water supply; waste management ³	..	..	29,683	30,588
Construction	787	..	..	..
Grand Total	155,968	231,780	569,331	957,080

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value.

5. - denotes nil, figures unavailable or too small to display.

Table 18 (2015)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2015^{r,2}

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	45,249	154,943	314,946	515,138
Chemicals	..	26,243	..	167,441
Mechanical engineering	15,805	11,305	19,948	47,058
Electrical machinery	8,222	91,595	55,334	155,152
Transport equipment & aerospace	..	2,307	..	11,689
Other manufacturing	15,155	23,494	95,149	133,798
Services	132,889	39,608	188,323	360,819
Other Sectors	1,962	7,564	67,144	76,669
Agriculture, hunting & forestry; Fishing	601	..	..	6,249
Extractive industries	..	..	36,972	38,395
Electricity, gas & water supply; waste management ³	..	..	18,636	19,945
Construction	..	1,370	..	12,080
Grand Total	180,099	202,114	570,412	952,626

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes disclosive value.
5. - denotes nil, figures unavailable or too small to display.

Table 18 (2016)
Expenditure on R&D performed within businesses in Scotland by total
UK company employment sizebands: Broad Product Groups, 2016¹

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	59,887	204,031	327,994	591,911
Chemicals	17,708	26,470	122,538	166,716
Mechanical engineering	10,454	13,975	14,827	39,256
Electrical machinery	14,165	116,739	81,251	212,155
Transport equipment & aerospace	3,347	5,459	17,279	26,084
Other manufacturing	14,213	41,387	92,098	147,699
Services	136,125	35,471	194,266	365,861
Other Sectors	4,572	7,239	102,551	114,362
Agriculture, hunting & forestry; Fishing	..	..	3,912	8,254
Extractive industries	..	..	63,429	66,781
Electricity, gas & water supply; waste management ²	..	..	21,531	21,595
Construction	..	..	13,679	17,732
Grand Total	200,583	246,741	624,810	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
3. .. Denotes disclosive value.
4. - denotes nil, figures unavailable or too small to display.

Table 19 (2014)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2014^{r,2}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	938	1,493	2,543	4,974
Chemicals	..	125	..	1,501
Mechanical engineering	289	238	121	648
Electrical machinery	135	726	580	1,441
Transport equipment & aerospace	..	21	..	98
Other manufacturing	327	383	576	1,286
Services	2,208	512	2,417	5,138
Other Sectors	38	226	538	802
Agriculture, hunting & forestry; Fishing	..	..	..	44
Extractive industries	..	..	302	312
Electricity, gas & water supply; waste management ³	..	..	179	195
Construction	21	..	..	251
Grand Total	3,184	2,231	5,499	10,914

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value

5. - denotes nil, figures unavailable or too small to display.

Table 19 (2015)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2015^{r,2}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	872	1,608	2,819	5,299
Chemicals	..	240	..	1,601
Mechanical engineering	238	205	131	575
Electrical machinery	167	739	581	1,487
Transport equipment & aerospace	..	28	..	142
Other manufacturing	318	395	781	1,494
Services	2,385	639	2,542	5,565
Other Sectors	47	511	442	1,000
Agriculture, hunting & forestry; Fishing	16	..	..	77
Extractive industries	..	..	233	237
Electricity, gas & water supply; waste management ³	..	..	150	167
Construction	..	446	..	519
Grand Total	3,304	2,758	5,803	11,864

Source: ONS and Scottish Government

Notes:

1. r denotes revised figures

2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes disclosive value

5. - denotes nil, figures unavailable or too small to display.

Table 19 (2016)
R&D employment within businesses in Scotland by total UK company
employment sizebands: Broad Product Groups, 2016¹

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	1,167	1,960	2,882	6,009
Chemicals	232	277	1,231	1,740
Mechanical engineering	224	209	160	593
Electrical machinery	204	724	687	1,615
Transport equipment & aerospace	98	67	156	321
Other manufacturing	409	682	648	1,739
Services	2,072	539	2,277	4,888
Other Sectors	127	241	678	1,045
Agriculture, hunting & forestry; Fishing	..	..	21	81
Extractive industries	91	..	..	556
Electricity, gas & water supply; waste management ²	..	..	135	137
Construction	29	..	..	271
Grand Total	3,366	2,740	5,837	11,943

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. .. Denotes disclosive value

4. - denotes nil, figures unavailable or too small to display.

Total 20 (2014)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2014^{r,3}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	540	150	55	740
Chemicals	50	15	0	65
Mechanical engineering	150	30	10	195
Electrical machinery	55	20	5	80
Transport equipment & aerospace	10	5	5	25
Other manufacturing	275	80	30	385
Services	1,730	95	30	1,855
Other Sectors	155	25	20	200
Agriculture, hunting & Forestry; Fishing	25	0	0	25
Extractive industries	15	0	10	25
Electricity, gas & water supply; waste management ⁴	0	5	5	10
Construction	115	20	5	140
Grand Total	2,420	265	105	2,795

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. r denotes revised figures.
6. Totals may not sum due to rounding.

Total 20 (2015)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2015^{r,3}

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	600	150	55	805
Chemicals	45	15	5	65
Mechanical engineering	175	30	10	215
Electrical machinery	60	15	5	80
Transport equipment & aerospace	15	5	5	25
Other manufacturing	305	85	30	420
Services	1,855	100	30	1,985
Other Sectors	170	25	20	220
Agriculture, hunting & Forestry; Fishing	30	0	0	30
Extractive industries	15	0	10	25
Electricity, gas & water supply; waste management ⁴	0	5	5	10
Construction	125	20	5	155
Grand Total	2,625	280	110	3,010

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. r denotes revised figures.
6. Totals may not sum due to rounding.

Total 20 (2016)

Number of businesses¹ performing R&D within Scotland by total UK company employment sizebands: Broad Product Groups², 2016³

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	660	155	55	875
Chemicals	50	15	5	65
Mechanical engineering	190	35	10	235
Electrical machinery	65	15	5	85
Transport equipment & aerospace	20	5	5	35
Other manufacturing	335	85	30	455
Services	1,900	110	35	2,045
Other Sectors	180	25	20	225
Agriculture, hunting & Forestry; Fishing	30	0	5	30
Extractive industries	15	0	10	30
Electricity, gas & water supply; waste management ⁴	5	0	0	5
Construction	130	25	5	160
Grand Total	2,740	295	115	3,145

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is discontinuity between the date for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. .. Denotes nil, figures unavailable, too small to display or disclosive value
6. Totals may not sum due to rounding.

Table 21 (2014)

**Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2014^{r,2}**

	£ thousands			
	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	67	1,179	5,642	704
Chemicals	..	1,809	..	2,482
Mechanical engineering	87	247	1,560	196
Electrical machinery	120	6,054	11,902	2,547
Transport equipment & aerospace	..	224	..	278
Other manufacturing	43	403	2,610	314
Services	68	407	5,563	180
Other Sectors	10	450	4,692	510
Agriculture, hunting & Forestry; Fishing	..	..	..	..
Extractive industries	..	..	4,669	1,885
Electricity, gas & water supply; waste management ³	..	..	7,270	3,748
Construction	7	..	..	..
Grand Total	64	842	5,448	342

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.

2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

4. .. Denotes nil, figures unavailable, too small to display or disclosive value

5. r denotes revised figures.

6. Totals may not sum due to rounding.

Table 21 (2015)

**Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2015^{r,2}**

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	74	990	5,871	641
Chemicals	..	1,640	..	2,597
Mechanical engineering	88	271	2,143	218
Electrical machinery	139	5,616	12,100	2,107
Transport equipment & aerospace	..	384	..	262
Other manufacturing	49	277	2,765	295
Services	72	392	5,871	181
Other Sectors	11	276	3,025	347
Agriculture, hunting & Forestry; Fishing	21	..	..	195
Extractive industries	..	..	3,697	1,476
Electricity, gas & water supply; waste management ³	..	..	4,563	2,445
Construction	..	57	..	77
Grand Total	68	706	5,297	316

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes nil, figures unavailable, too small to display or disclosive value
5. r denotes revised figures.
6. Totals may not sum due to rounding.

Table 21 (2016)
Average expenditure on R&D within businesses performing R&D in Scotland
by total UK company employment sizebands: Broad Product Groups¹, 2016²

	0 to 99 employees	100 to 399 employees	400 employees and over	Total all Employees
Manufacturing	88	1,270	5,931	680
Chemicals	369	1,765	43,223	2,634
Mechanical engineering	53	372	1,809	180
Electrical machinery	221	8,162	14,721	2,723
Transport equipment & aerospace	140	611	2,001	565
Other manufacturing	39	469	2,447	281
Services	72	312	5,998	183
Other Sectors	23	256	4,174	453
Agriculture, hunting & Forestry; Fishing	..	..	1,304	258
Extractive industries	..	..	6,343	2,289
Electricity, gas & water supply; waste management ³	..	..	5,510	1,848
Construction	..	..	1,924	107
Grand Total	72	813	5,609	341

Source: ONS and Scottish Government

Notes:

1. Where business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. .. Denotes nil, figures unavailable, too small to display or disclosive value
5. Totals may not sum due to rounding.

Table 22
Expenditure and employment on R&D performed within businesses in Scotland
by country of ownership of business performing R&D: 2001 to 2016

	Expenditure (£ thousands)															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scotland	97,806	120,853	134,314	133,951	143,230	144,736	159,426	157,635	159,635	216,460	204,530	222,480	236,731	346,435	396,308	375,417
Rest of the UK	121,207	65,574	52,975	58,381	40,941	21,255	33,139	36,279	55,056	30,729	40,847	23,597	25,294	58,425	46,958	80,897
Other EU¹	56,046	68,284	51,490	55,643	96,886	90,983	123,401	93,416	97,713	102,396	112,845	139,433	151,108	124,808	125,836	182,434
United States	219,541	233,528	186,564	170,758	207,027	186,996	204,956	240,632	286,219	241,236	285,129	269,396	314,927	347,366	343,358	368,128
Rest of the World	22,069	18,471	15,922	11,646	18,375	16,286	21,674	25,548	32,542	27,997	53,347	53,756	72,981	80,045	40,167	65,259
Total	516,669	506,710	441,265	430,379	506,459	460,255	542,596	553,510	631,165	618,818	696,698	708,662	801,043	957,080	952,626	1,072,134
	Employment															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Scotland	1,884	2,442	2,309	2,405	2,317	2,175	2,344	2,545	2,519	3,247	3,518	3,686	3,939	5,483	6,315	5,657
Rest of the UK	1,544	987	882	721	518	292	246	210	282	226	342	228	632	619	561	702
Other EU¹	733	842	626	723	1,135	1,049	1,214	1,194	1,180	1,172	907	1,100	1,358	944	1,138	1,433
United States	2,724	2,697	2,363	2,333	2,300	2,547	2,785	2,475	2,717	2,412	2,510	2,703	3,015	3,140	3,320	3,455
Rest of the World	325	301	273	229	267	246	337	279	326	414	533	624	718	729	530	695
Total	7,210	7,269	6,452	6,412	6,537	6,309	6,926	6,703	7,024	7,472	7,810	8,342	9,662	10,914	11,864	11,943

Source: ONS and Scottish Government

Notes:

1. The Other EU category shows data from the other EU28 countries.
2. r denotes revised figures.
3. Totals may not sum due to rounding.

Total 23 (2014)

Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Group, 2014^{f,1}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	92,361	..	93,294	268,480	..	521,278
Chemicals	25,494	..	1,059	..	..	158,840
Mechanical engineering	18,706	..	7,537	12,031	..	39,555
Electrical machinery	15,648	..	..	85,292	1,469	173,465
Transport equipment & aerospace	3,434	..	..	..	..	6,681
Other manufacturing	29,079	6,022	42,531	39,124	25,980	142,736
Services	239,250	..	14,261	47,539	..	332,568
Other Sectors	14,824	..	17,252	31,347	..	103,234
Agriculture, hunting & forestry; Fishing	..	-	-	..	..	..
Extractive industries	..	..	8,177	26,543	10,402	49,005
Electricity, gas & water supply; waste management ²	..	..	8,613	..	..	30,588
Construction	5,037	..	462	..	..	..
Grand Total	346,435	58,425	124,808	347,366	80,045	957,080

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. The Other EU category shows data from the other EU28 countries.

4. r denotes revised figures.

5. .. Denotes disclosive values.

6. - denotes nil, figures unavailable or too small to display.

Total 23 (2015)

Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Group, 2015^{r,1}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	113,075	33,760	81,883	270,245	16,174	515,138
Chemicals	26,079	..	..	..	..	167,441
Mechanical engineering	19,505	..	7,680	18,231	..	47,058
Electrical machinery	14,319	..	39,306	81,459	..	155,152
Transport equipment & aerospace	2,714	..	..	..	..	11,689
Other manufacturing	50,458	8,874	29,580	33,890	10,996	133,798
Services	270,468	..	15,401	48,614	..	360,819
Other Sectors	12,764	..	28,552	24,499	..	76,669
Agriculture, hunting & forestry; Fishing	551	-	..	..	..	6,249
Extractive industries	..	..	12,075	20,897	..	38,395
Electricity, gas & water supply; waste management ²	..	..	7,863	..	..	19,945
Construction	3,096	..	..	..	-	12,080
Grand Total	396,308	46,958	125,836	343,358	40,167	952,626

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. The Other EU category shows data from the other EU28 countries.

4. r denotes revised figures.

5. .. Denotes disclosive values.

6. - denotes nil, figures unavailable or too small to display.

Total 23 (2016)

Expenditure on R&D performed within businesses in Scotland by country of ownership of business performing R&D: Broad Product Group, 2016¹

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ³	United States	Rest of the World	
Manufacturing	123,183	58,985	96,760	276,319	36,665	591,911
Chemicals	22,569	..	..	120,575	..	166,716
Mechanical engineering	17,759	..	10,130	..	1,813	39,256
Electrical machinery	35,088	..	42,827	108,054	..	212,155
Transport equipment & aerospace	12,609	..	..	..	..	26,084
Other manufacturing	35,157	11,993	41,115	36,455	22,978	147,699
Services	237,627	18,649	35,331	63,546	10,709	365,861
Other Sectors	14,607	3,263	50,343	28,263	17,885	114,362
Agriculture, hunting & forestry; Fishing	..	..	..	..	3,912	8,254
Extractive industries	4,142	..	29,925	24,249	..	66,781
Electricity, gas & water supply; waster management ²	..	..	..	..	..	21,595
Construction	4,472	..	..	..	-	17,732
Grand Total	375,417	80,897	182,434	368,128	65,259	1,072,134

Source: ONS and Scottish Government

Notes:

1. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007.

See Note 16 of the background notes for details.

2. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.

3. The Other EU category shows data from the other EU28 countries.

4. .. Denotes disclosive values.

5. - denotes nil, figures unavailable or too small to display.

Table 24 (2014)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2014^{r,3}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	595	15	40	55	35	740
Chemicals	50	0	5	10	0	65
Mechanical engineering	155	0	15	15	10	195
Electrical machinery	60	0	5	10	5	80
Transport equipment & aerospace	20	0	0	0	0	25
Other manufacturing	315	10	20	20	20	385
Services	1,745	10	25	40	25	1,855
Other Sectors	170	0	10	5	10	200
Agriculture, hunting & forestry; Fishing	25	0	0	0	0	25
Extractive industries	10	0	5	5	5	25
Electricity, gas & water supply; waste management ⁴	5	0	5	0	0	10
Construction	135	0	5	0	0	140
Grand Total	2,515	30	80	100	70	2,795

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards, Waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.
6. r denotes revised figures.

Table 24 (2015)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2015^{r,3}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	665	15	40	50	30	805
Chemicals	50	0	0	10	5	65
Mechanical engineering	180	0	15	10	5	215
Electrical machinery	65	0	5	5	5	80
Transport equipment & aerospace	20	0	0	5	0	25
Other manufacturing	350	10	20	25	20	420
Services	1,880	10	30	40	30	1,985
Other Sectors	190	0	15	5	5	220
Agriculture, hunting & forestry; Fishing	30	0	0	0	0	30
Extractive industries	10	0	10	5	0	25
Electricity, gas & water supply; waste management ⁴	5	0	5	0	0	10
Construction	150	0	0	0	0	155
Grand Total	2,735	30	85	95	65	3,010

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.
6. r denotes revised figures.

Table 24 (2016)

Number of businesses¹ performing R&D within Scotland by country of ownership of business performing R&D: Broad Product Groups², 2016³

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁵	United States	Rest of the World	
Manufacturing	730	15	40	50	40	875
Chemicals	50	0	5	10	0	65
Mechanical engineering	200	0	10	10	15	235
Electrical machinery	65	0	5	10	5	85
Transport equipment & aerospace	30	0	0	5	0	35
Other manufacturing	390	10	20	15	20	455
Services	1,925	20	35	40	25	2,045
Other Sectors	195	5	10	10	10	225
Agriculture, hunting & forestry; Fishing	25	0	0	0	5	30
Extractive industries	10	0	5	5	5	30
Electricity, gas & water supply; waste management ⁴	5	0	0	0	0	5
Construction	155	0	5	0	0	160
Grand Total	2,850	35	90	100	70	3,145

Source: ONS and Scottish Government

Notes:

1. The number of businesses are rounded to the nearest 5.
2. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
3. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
4. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
5. The Other EU category shows data from the other EU28 countries.

Table 25 (2014)
Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2014^{r,2}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	155	..	2,252	4,962	868	704
Chemicals	520	..	265	..	..	2,482
Mechanical engineering	119	..	437	882	..	196
Electrical machinery	265	..	..	9,318	367	2,547
Transport equipment & aerospace	197	..	..	..	..	278
Other manufacturing	93	602	971	1,985	1,299	314
Services	137	..	473	1,210	..	180
Other Sectors	86	..	1,453	5,175	..	510
Agriculture, hunting & forestry; Fishing	..	-	-	..	..	..
Extractive industries	..	..	1,363	6,636	2,080	1,885
Electricity, gas & water supply; waste management ³	..	..	2,934	..	..	3,748
Construction	37	..	154	..	..	..
Grand Total	138	2,087	1,541	3,474	1,127	342

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values
6. r denotes revised figures

Table 25 (2015)
Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2015^{r,2}

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	170	2,251	2,010	5,185	..	641
Chemicals	511	..	..	..	..	2,597
Mechanical engineering	108	..	385	1,739	..	218
Electrical machinery	220	..	9,765	12,950	..	2,107
Transport equipment & aerospace	135	..	..	..	..	262
Other manufacturing	145	888	952	1,495	611	295
Services	144	..	453	1,263	..	181
Other Sectors	67	..	2,052	4,083	..	347
Agriculture, hunting & forestry; Fishing	20	-	..	..	..	195
Extractive industries	..	..	1,508	4,179	..	1,476
Electricity, gas & water supply; waste management ³	..	..	2,682	..	..	2,445
Construction	21	..	..	..	-	77
Grand Total	145	1,619	1,498	3,540	618	316

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values
6. r denotes revised figures

Table 25 (2016)
Average expenditure on R&D within businesses performing R&D in Scotland
by country of ownership of business performing R&D: Broad Product Groups¹, 2016²

	Country of Ownership					Total
	Scotland	Rest of the UK	Other EU ⁴	United States	Rest of the World	
Manufacturing	169	4,541	2,363	5,756	917	680
Chemicals	451	..	..	12,057	..	2,634
Mechanical engineering	99	..	740	..	139	180
Electrical machinery	495	..	13,346	13,171	..	2,723
Transport equipment & aerospace	452	..	..	..	..	565
Other manufacturing	91	1,497	1,004	2,270	1,149	281
Services	123	1,006	1,221	1,514	446	183
Other Sectors	75	585	3,676	2,826	2,236	453
Agriculture, hunting & forestry; Fishing	..	..	..	..	1,304	258
Extractive industries	345	..	4,216	3,464	..	2,289
Electricity, gas & water supply; waste management ³	..	..	..	..	..	1,848
Construction	29	..	..	..	-	107
Grand Total	132	2,247	2,073	3,681	906	341

Source: ONS and Scottish Government

Notes:

1. Where a business undertakes R&D expenditure in more than one broad product group the business is allocated to the broad product group in which it undertakes the highest R&D expenditure.
2. There is a discontinuity between the data for 2009 onwards with earlier years due to the introduction of SIC 2007. See Note 16 of the background notes for details.
3. From 2009 onwards waste management is included in Electricity, gas & water supply; waste management, when previously it was included in Other manufacturing.
4. The Other EU category shows data from the EU28 countries.
5. .. Denotes nil, figures unavailable, too small to display or disclosive values

Table 26
Expenditure on R&D performed within businesses in Scotland
by Growth Sector, 2009-2016

Growth Sector	£ thousands							
	Year							
	2009	2010	2011	2012	2013	2014 ^r	2015 ^r	2016
Food & Drink	17,576	20,242	26,771	24,214	22,163	19,310	16,911	..
Financial and Business Services	19,067	16,114	..	29,576	..	162,299	154,782	145,141
Life Sciences	153,783	171,822	254,130	254,647	270,451	293,393	285,063	264,682
Energy (including Renewables)	57,135	49,818	75,030	45,473	89,956	77,038	61,402	100,829
Sustainable Tourism (Tourism-related industries)	1,044	3,036	..	3,599	..	3,931	4,538	..
Creative Industries (including Digital)	57,386	58,413	70,703	101,732	123,899	140,426	138,850	164,872
All	305,991	319,446	445,615	459,241	563,123	696,398	661,546	715,025

Source: ONS and Scottish Government

Notes:

1. .. Denotes disclosive value.

2. r denotes revised figures.

3. Growth sectors are based on Standard Industrial Classification 2007 codes. More information on how the growth sectors are defined is available at:

<http://www.gov.scot/Topics/Statistics/Browse/Business/Publications/GrowthSectors>

4. Totals may not sum due to rounding.

Table 27
Expenditure on R&D performed in Businesses in Scotland:
by small and medium size enterprises¹, 2006-2016

£ million				
Year	0 to 249 employees		250 employees and over	Total Expenditure
	Independent SME	Part of larger enterprise group		
2006	26	100	334	460
2007	37	122	384	543
2008	26	152	375	554
2009	55	116	460	631
2010	46	131	441	619
2011	56	149	492	697
2012	75	139	494	709
2013	57	171	573	801
2014^r	68	233	655	957
2015^r	87	199	667	953
2016	88	216	768	1,072

Source: ONS and Scottish Government

Notes:

1. The definition of SME used is that under the European Commission Recommendation (96/280/EC) of 3 April 1996, in which SMEs are defined as being enterprises with less than 250 employees, and also a criterion of independence is used to exclude enterprises that are part of a larger enterprise group. To apply this definition, historic information on company ownership has been obtained using that currently held on the ONS IDBR. Caution should therefore be used in making comparisons over time.

2. r denotes revised figures.

3. Totals may not sum due to rounding.

Table 28 (2014)
Expenditure and employment on R&D performed in Businesses in Scotland:
Top 100 Enterprise Groups, 2014^f

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	957,080	10,914
Enterprise groups with the largest expenditure on R&D		
Top 5	284,124	2,530
Top 10	407,738	3,265
Top 15	484,582	3,945
Top 20	546,486	4,503
Top 50	708,609	5,995
Top 100	778,120	7,006

Source: ONS and Scottish Government

1. r denotes revised figures

Table 28 (2015)
Expenditure and employment on R&D performed in Businesses in Scotland:
Top 100 Enterprise Groups, 2015^r

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	952,626	11,864
Enterprise groups with the largest expenditure on R&D		
Top 5	280,186	2,620
Top 10	397,765	3,461
Top 15	467,831	4,386
Top 20	514,166	4,820
Top 50	674,384	6,524
Top 100	744,361	7,455

Source: ONS and Scottish Government

1. r denotes revised figures

Table 28 (2016)
Expenditure and employment on R&D performed in Businesses in Scotland:
Top 100 Enterprise Groups, 2016

	Total Intramural Expenditure (£ thousands)	R&D Employment (Full time equivalent)
TOTAL ALL ENTERPRISES	1,072,134	11,943
Enterprise groups with the largest expenditure on R&D		
Top 5	275,928	2,406
Top 10	419,414	3,661
Top 15	509,570	4,060
Top 20	569,618	4,498
Top 50	753,488	6,442
Top 100	841,444	7,577

Source: ONS and Scottish Government

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The data collected for this statistical bulletin publication>:

- are available in more detail through Statistics.gov.scot
- may be made available on request, subject to consideration of legal and ethical factors. Please contact industrystatistics@gov.scot for further information.
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