

Statistical bulletin

Government expenditure on science, engineering and technology, UK: 2017

Science, engineering and technology annual expenditure by UK government departments, research councils and higher education funding councils.

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1 . Main points

- The UK government's expenditure on science, engineering and technology (SET) relating to research and development grew by £0.7 billion to £12.2 billion in 2017, an increase of 6.4%.
- Total expenditure on SET represented 0.59% of gross domestic product (GDP), little changed from 0.58% in 2016.
- The UK research councils contributed the most to expenditure on SET in 2017 at £3.8 billion, 31% of the total.
- In constant prices (adjusted for inflation), civil departments' expenditure on SET grew by 46.0% over the period 2006 to 2017, from £2.5 billion to £3.7 billion.
- Defence expenditure on SET decreased from 2006 by 36.8% in constant prices to £1.6 billion in 2017.

2 . Things you need to know about this release

UK government expenditure on science, engineering and technology (SET) covers estimates of expenditure by government departments, research councils and higher education funding councils (HEFCs). Most estimates are on a net expenditure basis, that is, 'in-house' research and development (R&D) performed, plus purchased or funding provided for R&D, less funding received for R&D. Estimates of expenditure on knowledge transfer and the UK's contribution to the EU's R&D budget are also included.

These figures on SET expenditure should not be confused with the [Gross domestic expenditure on research and development, UK: 2017](#) (GERD) statistical bulletin published on 14 March 2019, which only includes expenditure on R&D performed 'in-house', that is, by organisations themselves, by all sectors of the economy. This is explained in more detail in the [UK gross domestic expenditure on research and development Quality and Methodology Information](#).

The UK government's [Industrial Strategy](#) includes a target to "raise investment on R&D to 2.4% of GDP by 2027". UK R&D statistics are needed to assess how sectors of the economy are contributing towards reaching this policy goal. Progress to this target can be seen in the GERD statistical bulletin, which shows that GERD represented 1.69% of GDP in 2017, up from 1.67% in 2016.

The main source of estimates for this publication is the annual Government Research and Development survey (GovERD).

In this statistical bulletin, R&D and related concepts follow internationally agreed standards defined by the [Organisation for Economic Cooperation and Development](#) (OECD), as published in the [Frascati Manual](#) (2015).

All figures quoted are in current prices unless otherwise stated.

The majority of the data series are available from 2001, however, constant price comparisons (adjusted to remove the effects of inflation) have been made using the dataset in this release, starting in 2006.

Note that the focus of this bulletin is on expenditure by the UK government sector. Any funds that may be received back by the UK government are not in scope of this bulletin.

3 . Government spending on science, engineering and technology stable as a percentage of GDP

Total expenditure on science, engineering and technology (SET) represented 0.59% of gross domestic product (GDP), compared with 0.58% in 2016. The proportion has remained stable since 2012 (Figure 1).

At £12.2 billion in 2017, expenditure on SET reached its highest level on record, up from £11.5 billion in 2016. This was an increase of 6.4% which was above the long-term annual average growth since 2006 of 2.2%.

In comparison, government expenditure on performing research and development (R&D), in-house, as detailed in the [Gross domestic expenditure on research and development, UK: 2017](#) and table 15 of the SET datasets, represented 0.11% of GDP, unchanged from 2016.

All areas of SET expenditure, apart from contributions to the EU budget, saw growth since 2016. While expenditure by civil and defence departments, research councils and higher education funding councils (HEFCs) grew by £760 million, the contribution to the EU R&D budget fell by £21 million.

In constant prices, the 2017 estimate surpassed the previous high of £11.9 billion in 2009.

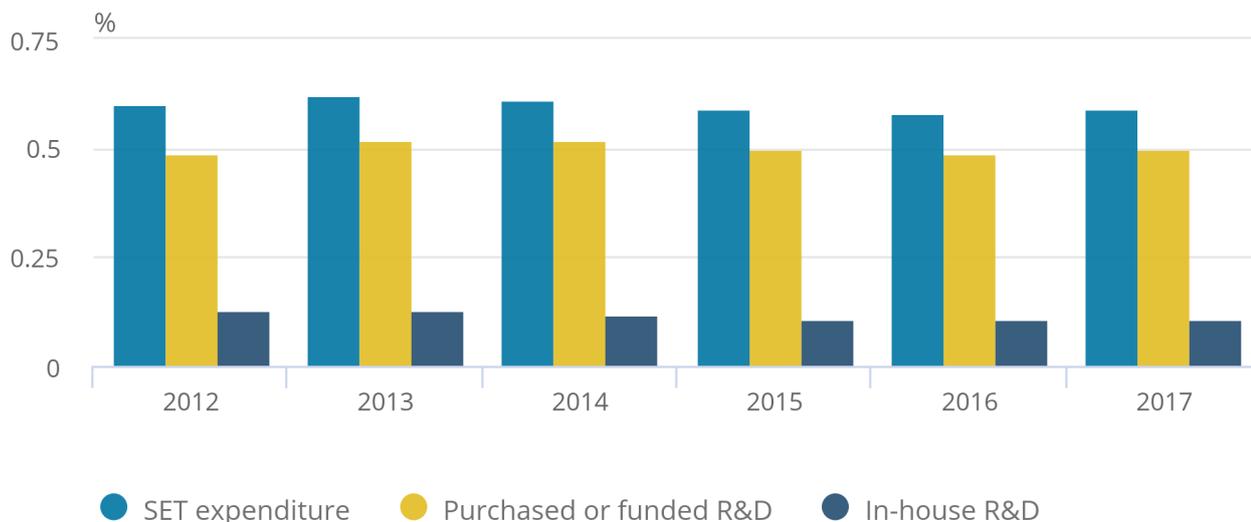
Purchased or funded R&D increased to 0.50% of GDP compared with 0.49% in 2016. Figure 1 shows total SET, purchased or funded R&D and in-house R&D as a percentage of GDP from 2012 to 2017.

Figure 1: Total UK government expenditure on science, engineering and technology represented 0.59% of GDP in 2017.

UK, 2012 to 2017

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UK, 2012 to 2017



Source: Office for National Statistics

Notes:

1. Purchased or funded R&D and In-house R&D do not sum to SET expenditure due to the omission of funding received.

4 . Civil departments and research councils account for almost two-thirds of total UK government spending on SET

UK government estimates of science, engineering and technology (SET) are categorised into expenditure by research councils, higher education funding councils (HEFCs), and by civil and defence departments, most of which include elements of knowledge transfer. Estimates of the UK's contribution to the EU's research and development (R&D) expenditure made by HM Treasury are also included.

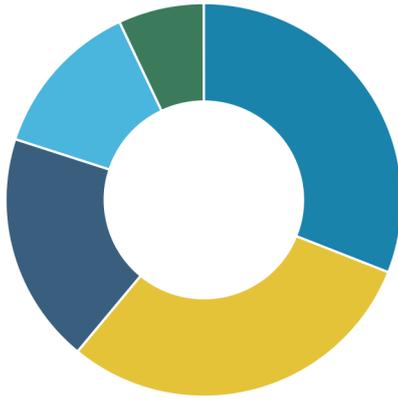
Figure 2 shows the contribution each sector of government made to the SET estimate in 2017. Almost a third (31%) of UK government expenditure on SET was by research councils, with civil departments and HEFCs contributing 30% and 19% respectively. Defence expenditure and contributions to EU R&D expenditure made up the remaining 13% and 7% respectively.

Figure 2: Research councils' expenditure on science, engineering and technology was £3.8 billion, 31% of the UK total.

UK, 2017

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UK, 2017



Source: Office for National Statistics

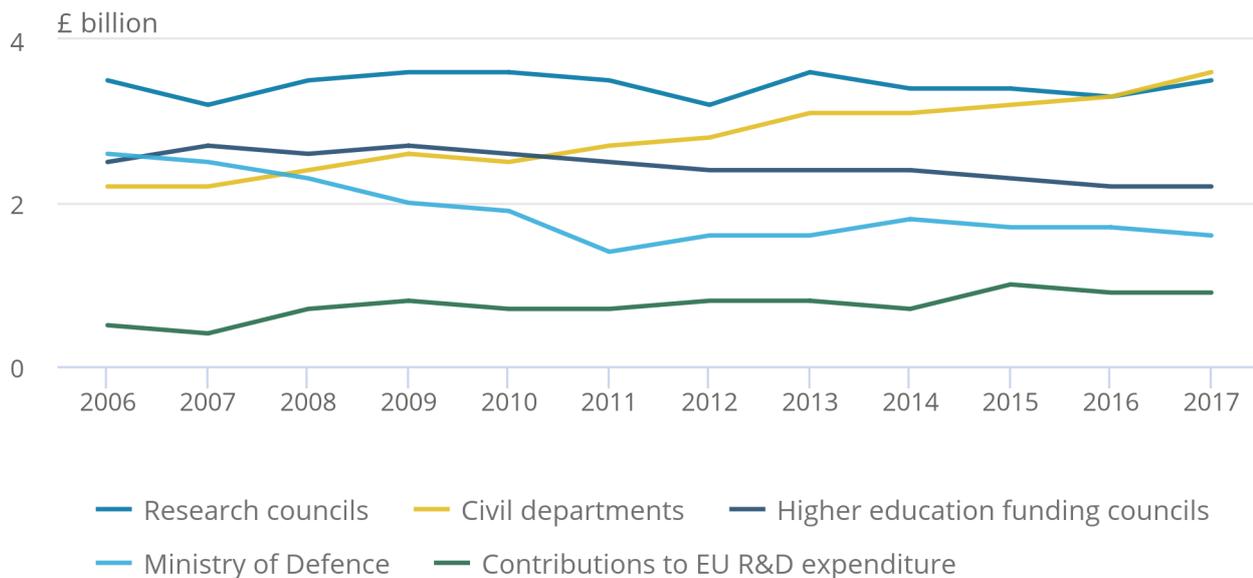
Figure 3 shows changes in SET components between 2006 and 2017 in constant prices. Defence expenditure decreased by £1.0 billion (36.8%) from £2.6 billion in 2006 to £1.6 billion in 2017. Over the same period there was growth in civil departments' expenditure on SET of £1.2 billion (46.0%).

Figure 3: Civil departments overtake research councils to become largest funder of science, engineering and technology in the UK in 2017

UK, 2006 to 2017

Figure 3: Civil departments overtake research councils to become largest funder of science, engineering and technology in the UK in 2017

UK, 2006 to 2017



Source: Office for National Statistics

5. Research councils' expenditure increases in 2017 following three consecutive falls

In 2018 [United Kingdom Research and Innovation \(UKRI\)](#) was created to bring together the seven research councils, [Innovate UK](#) and some functions of the former higher education funding council for England (HEFCE) into one unified body. Its functions in relation to allocation of research funds in the higher education sector will be continued by [Research England](#), the new council within UKRI.

Each year the research councils fund and perform research and development (R&D) covering the full spectrum of academic disciplines, from the medical and biological sciences to astronomy, physics, chemistry, engineering, social sciences, economics, environmental sciences and the arts and humanities.

Expenditure on science, engineering and technology (SET) by research councils was £3.8 billion in 2017. This was up £364 million (10.7%) since 2016.

The research council with the highest expenditure on SET (£1.0 billion in 2017) continued to be the Engineering and Physical Sciences Research Council (EPSRC), representing 27% of research councils' SET expenditure.

The majority of EPSRC expenditure was funding of R&D for UK higher education institutes at £0.8 billion. However, it did not perform any R&D itself. While the EPSRC's expenditure on SET grew by 13.5%, the Natural Environment Research Council (NERC) had the largest movement in percentage terms increasing by 17.5% (£74 million) from £0.4 billion in 2016. NERC represented 13% of all research councils' expenditure on SET.

As well as having the largest proportion, the EPSRC had the highest absolute year on year growth of the research councils, of £122 million. Over the long term, the EPSRC also had the highest growth since 2006, in constant prices, of 30.7% (£240 million).

In contrast, in 2017 the council performing the most R&D was the Science and Technology Facilities Council at £350 million, which was 40.4% of total research councils expenditure on performing R&D (Table 12), followed closely by the NERC at £348 million (40.2%).

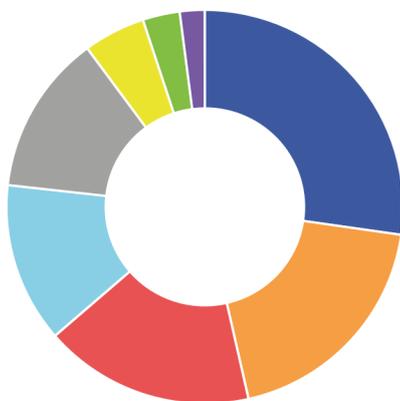
The research councils' estimated expenditure on SET includes their pension arrangements. These pension contributions are included separately in the datasets associated with this publication and in Figure 4.

Figure 4: Engineering and Physical Sciences remained the research council with the largest expenditure on science, engineering and technology

UK, 2017

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UK, 2017



Source: Office for National Statistics

Notes:

1. Percentages sum to 99 due to rounding

6 . Civil departments' expenditure increases for the seventh successive year

The UK government owns many research institutes and laboratories that carry out research and development (R&D) and are managed by various government departments. It also uses a range of suppliers with facilities to carry out research, both inside and outside the UK.

In 2017, expenditure by civil departments on science, engineering and technology (SET) was £3.7 billion, with growth of £0.4 billion (10.7%) since 2016. In constant prices, the growth since 2006 was £1.2 billion (46.0%).

In 2017, two departments contributed £2.7 billion (74%) to the civil departments' total. The Department for Business, Energy and Industrial Strategy (BEIS) was the largest contributor to this, with expenditure of £1.6 billion, a rise of £251 million (18.4%) from 2016. This was also an increase in its share of total civil departments' expenditure on SET (Figure 5) of three percentage points, to 44%. The National Health Service (NHS) was the second largest contributor to civil department spending with £1.1 billion, growing £0.1 billion (8.0%) in 2017. This accounted for 31% of the total, unchanged from 2016.

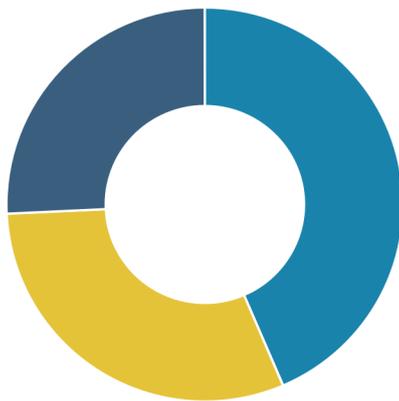
In terms of expenditure on all areas of SET, the NHS remained at 9% of total UK expenditure, while BEIS grew 1 percentage point to 13% of the total.

Figure 5: The Department for Business, Energy and Industrial Strategy was the civil department with the largest expenditure on science, engineering and technology.

UK, 2017

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UK, 2017



Source: Office for National Statistics

Notes:

1. Percentages sum to 101 due to rounding.

In terms of net government funding of R&D expenditure by socio-economic objective (purpose of the R&D programme or project), the “Health” category still leads the way with the largest share of the total at 22% in 2017, up from 21% in 2016 (Table 8). This proportion has fluctuated between 21% and 23% since 2011. The category of expenditure on “General advancement of knowledge: R&D financed from General University Fund” had the second largest share in 2017, at 21%. This was unchanged since 2016, but down from 25% since 2011, when this category had the largest share of expenditure. The “Defence” category had the third largest share, at 15% in 2017, down from 16% in 2016.

7 . Higher education funding councils' expenditure below 2009 high despite increase in 2017

Higher education funding councils (HEFCs) promote and fund teaching and research in higher education institutions (HEIs).

All HEIs provide finance statistics to the [Higher Education Statistics Agency \(HESA\)](#). Grant income provided by HEFCs is used as a proxy to estimate government-funded research and development expenditure in HEIs. This is explained in more detail in the [UK gross domestic expenditure on research and development Quality and Methodology Information](#).

In 2017, expenditure on science, engineering and technology (SET) by HEFCs was £2.3 billion, an increase of £30 million (1.3%) since 2016, but remaining lower than the peak of £2.4 billion in 2009. In constant prices, this was a decrease of £462 million (16.9%) since the peak of £2.7 billion in 2009 (Figure 3).

The Higher Education Funding Council for England (HEFCE) provides the most research funding as it funds the highest number of HEIs. In 2017, expenditure by HEFCE on SET was £1.8 billion. This was 79% of the total HEFCs' expenditure on SET, a similar level to recent years.

8 . Long-term downward trend for UK defence R&D expenditure

Defence expenditure on science, engineering and technology was £1.6 billion in 2017, a rise of £11 million (0.7%) since 2016. This increase followed two consecutive falls from 2014. The increase was mostly in the experimental development element, which rose by 6.2%, but was offset by a fall in the research element of 8.6%. In constant prices, since 2006, defence expenditure decreased by £1.0 billion (36.8%) (Figure 3). While defence research fell by 28.1% over this period, to £0.6 billion, defence experimental development fell by 40.5% to £1.1 billion. Defence accounted for 15% of government net research and development funding by socio economic classification, its lowest share since 2013 (see Table 8).

9 . Government funding for R&D more than five times its expenditure on performing R&D

In 2017, UK government funding of research and development (R&D) for third parties of £11.2 billion was more than five times the value it spent on performing R&D itself (£2.2 billion).

Government expenditure of funding and performing R&D is detailed in the [Gross domestic expenditure on research and development, UK: 2017](#) and table 15 of the datasets included with this release.

The largest recipient of government funding for R&D was UK higher education, receiving £5.0 billion (45% of total funding), almost double that of UK business in second place. Funding of UK higher education was dominated by a combination of research councils and the higher education funding councils. Both provided similar amounts, at £2.2 billion each, totalling 88% of all funding received.

The second largest recipient of government funding for R&D was UK business, at £2.6 billion (23% of total funding). This included £1.5 billion (57%) of funding from the Ministry of Defence.

Government investment in R&D of £11.8 billion in 2017 in constant prices was up by £0.5 billion (4.9%) on 2006. In contrast, expenditure in constant prices on performing R&D by government departments dropped by 20.5% (£0.6 billion) over the same period.

10 . UK's contribution to EU R&D expenditure in constant prices almost double that in 2006

In 2017, the UK contributed £858 million to EU research and development (R&D) expenditure. While this was almost double the total in 2006 (£455 million) in constant prices, it declined for a second consecutive year since the high of £953 million in 2015. These figures were provided by HM Treasury and are broad estimates. This is because member states' contributions are not made to individual expenditure programmes, but to the total EU budget. They are therefore referred to as "indicative UK contributions to EU R&D expenditure".

11 . Links to related statistics

Find further statistics on [research and development expenditure in the UK](#).

12 . Quality and methodology

The [UK government expenditure on science, engineering and technology Quality and Methodology Information](#) document contains important information on:

- the strengths and limitations of the data and how they compare with related data
- uses and users of the data
- how the output was created
- the quality of the output including the accuracy of the data

About the data

These points should be noted when examining this bulletin or the data tables:

- there may be differences between totals and the sum of their independently rounded components
- note that £1.0 billion equals £1,000 million in this release
- estimates for 2016 have been revised where necessary to take account of improved methodology, departments' misreporting or late returns
- gross domestic product (GDP) deflators at market prices, and money GDP used is non-seasonally adjusted. The [GDP deflators at market prices, and money GDP: September 2017 \(Quarterly National Accounts\)](#) can be viewed as a measure of general inflation in the domestic economy.