

Statistical bulletin

Environmental protection expenditure, UK: 2017

Estimates of environmental protection expenditure by UK general government and industries for 2017.

Contact:
Kirsty Mackenzie and Ellie
Whatley
environment.accounts@ons.gov.
uk
+44 (0)1633 456187

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1 . Main points

- In 2017, the UK government spent an estimated £14.7 billion on environmental protection, accounting for 1.8% of UK government expenditure.
- Environmental protection expenditure as a percentage of total government spending has been relatively consistent since 2006, ranging from 1.8% to 2.2%.
- The UK government spent £11.5 billion on solid waste management in 2017, just over three quarters of its total environmental protection expenditure.
- UK businesses spent £2.5 billion on environmental protection in 2017.
- Spend on wastewater management activities accounted for 40% of environmental protection spend by UK businesses in 2017.

2 . Things you need to know about this release

Why is environmental protection expenditure important?

Pressure is growing in the UK and internationally for governments, industries and individuals to take further action to help halt environmental degradation and climate change. The UK government is currently considering how to enshrine environmental accountability and ambition in law, with the establishment of an independent Office for Environmental Protection an important principle of the forthcoming [Environment Bill](#). The [Bank of England](#) has recently urged investors and businesses to consider the sustainability of their practices when making investment decisions.

This bulletin provides information on the level and types of environmental protection expenditure (EPE) that are made by both government and industries within the UK.

What is environmental protection expenditure?

EPE includes all activities and actions that have as their main purpose the prevention, reduction and elimination of pollution or any other degradation of the environment. Examples of EPE include:

- sewerage
- solid waste management
- treatment of exhaust gases
- protection of natural landscapes

Environmental protection types are classified in this bulletin according to an internationally recognised categorisation scheme devised by Eurostat: the [classification of environmental protection activities](#) (CEPA).

Interpreting environmental protection expenditure statistics

It is important to note that a low level of EPE does not necessarily mean that a country's government or industries are not effectively protecting the environment. If investment has been previously made in equipment that reduces or cleans waste products, then the cost of maintenance of these will be small compared with the cost of introducing new equipment.

Where investment has been made in equipment that is integrated within a production process, then only the additional cost over and above equivalent but less environmentally friendly equipment is included in the estimates provided. By contrast, the total cost of any equipment that is not integrated into a production process is included in the estimates. This means that if governments or industries have more focus on reducing and cleaning pollution as part of their production process, then their expenditure is likely to be less than for those that do not change their production processes and instead focus on cleaning the pollution produced by them.

This bulletin presents how much the general government (central and local) and certain industries spent on environmental protection in 2017. The latest available estimates of total UK EPE, which includes expenditure by general government, industry, non-profit institutions serving households (for example, charities, trade unions and religious societies) and households, are available to 2016 only and are included in the [Environmental protection expenditure: total](#) dataset accompanying this bulletin.

UK government EPE data ([Section 3](#)) come from the [Annual expenditure of general government](#), which is broken down by the Classification of the functions of government (COFOG). Information on EPE by industries ([Section 4](#) and [Section 5](#)) comes from an [annual survey](#). Surveys gather information from a sample rather than from the whole population. The sample is designed to allow for this and to be as accurate as possible given practical limitations such as time and cost constraints, but results from sample surveys are always estimates and not precise figures. This means that they are subject to some uncertainty and revisions. For more information on these sources, see the [Quality and methodology section](#).

3 . Environmental protection expenditure accounted for 1.8% of UK government spending in 2017

Environmental protection expenditure (EPE) by the UK general (central and local) government more than tripled between 1995 and 2017, from £4.2 billion to £14.7 billion. This expenditure is in current prices and no adjustments have been made to account for the effects of inflation (Figure 1).

The rise and subsequent fall of EPE by government between 2004 and 2006 is a result of the transfer of responsibilities between British Nuclear Fuels (BNF) and the Nuclear Decommissioning Authority (NDA). BNF, a non-government organisation, restructured in 2005 and the responsibility for nuclear decommissioning transferred to the government's NDA. The majority of the NDA costs for decommissioning were accounted for in 2005.

Types of EPE captured within the estimates for government include expenditure on:

- solid waste and wastewater management
- protection of biodiversity
- protecting ambient air and climate
- any research and development relating to these
- any other costs of complying with environmental regulation

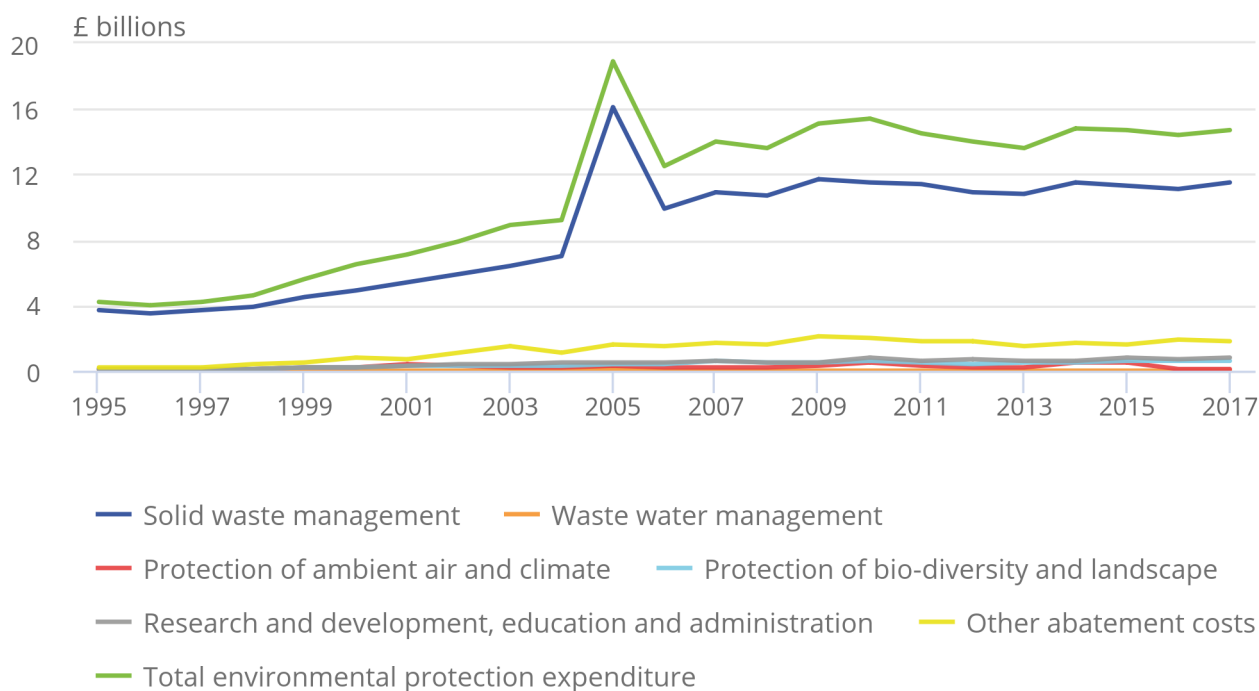
Since 1995, solid waste management activities such as waste collection and treatment have accounted for the highest proportion of all government EPE. In 2017, the government spent £11.5 billion on solid waste management, just over three-quarters of its total EPE.

Figure 1: Solid waste management consistently accounts for the largest proportion of environmental protection expenditure by UK government

Environmental protection expenditure by general government, UK, 1995 to 2017

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Environmental protection expenditure by general government, UK, 1995 to 2017



Source: Office for National Statistics – General government annual expenditure

Notes:

1. All estimates are reported at current prices, no adjustments have been made to account for the effects of inflation.
2. The rise and subsequent fall of EPE by government between 2004 and 2006 is a result of the transfer of responsibilities between British Nuclear Fuels (BNF) and the Nuclear Decommissioning Authority (NDA). BNF, a non-government organisation, restructured in 2005 and the responsibility for nuclear decommissioning transferred to the government's NDA. The majority of the NDA costs for decommissioning were accounted for in 2005.
3. Where expenditure for a particular activity and year is less than £0.1 billion, it is not shown.
4. Sub-totals may not sum to totals due to rounding.

EPE as a percentage of total government spending stood at 1.8% in 2017. It ranged from 1.3% to 1.8% between 1995 to 2004 before increasing in 2005 due to the transfer of responsibility to government for nuclear decommissioning. Since 2006, EPE as a percentage of total government spending has been relatively stable, ranging from 1.8% to 2.2%.

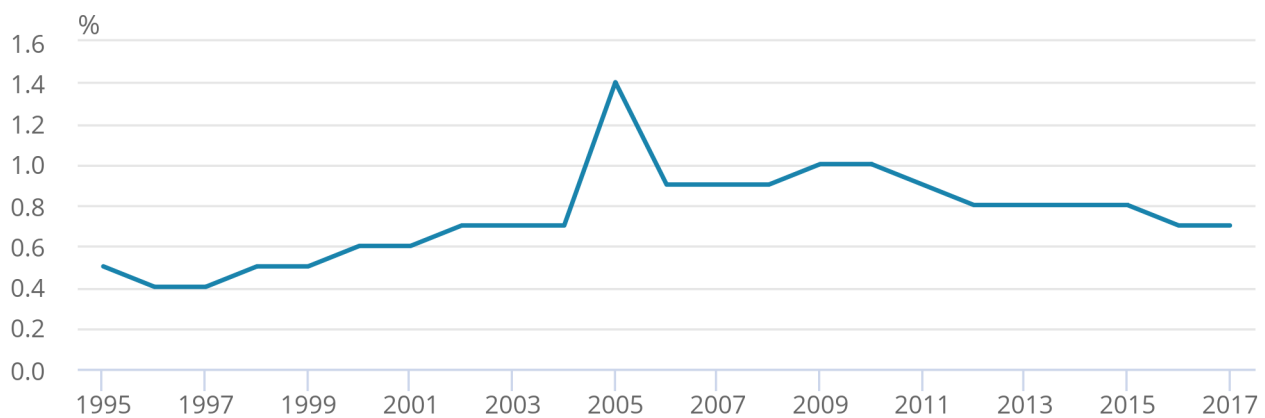
EPE by government as a percentage of gross domestic product (GDP) generally increased between 1995 and 2010. The rise in 2005 is attributed to the decommissioning of BNF. Between 2008 and 2009, EPE by government increased, while GDP fell during the economic downturn. EPE as a percentage of GDP fell slightly between 2010 and 2012, driven by a fall in expenditure (mainly on solid waste management) and an increase in GDP. Since 2012, EPE by government as a percentage of GDP has remained relatively stable at between 0.7% and 0.8%. It stood at 0.7% in 2017 (Figure 2).

Figure 2: Environmental protection expenditure by government as a percentage of GDP has been relatively stable since 2012

Environmental protection expenditure by general government as a percentage of GDP, UK, 1995 to 2017

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Environmental protection expenditure by general government as a percentage of GDP, UK, 1995 to 2017



Source: Office for National Statistics – General government annual expenditure

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1. All estimates are reported at current prices, no adjustments have been made to account for the effects of inflation.
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4 . UK businesses spent £2.5 billion on environmental protection in 2017

UK businesses spent an estimated £2.5 billion on environmental protection in 2017, compared with £2.1 billion in 2016. All estimates are provided in current prices and no adjustments have been made to take account of the effects of inflation (Table 1).

Environmental protection expenditure (EPE) can be divided between operating expenditure (opex), which relates to running costs that businesses incur to enable them to operate, and capital expenditure (capex), which relates to investment by businesses in assets such as land, equipment or buildings.

The majority of EPE by UK businesses relates to opex, which accounted for £1.8 billion and £1.6 billion in 2017 and 2016 respectively. This represented around 70% of all EPE by UK businesses in both years.

In-house operating costs of a business' own environmental protection activities, as well as external payments to others for environmental protection services (for example, waste disposal or sewage treatment) are both included in opex. In 2017, almost three-quarters (£1.3 billion) of opex related to external opex.

Businesses spent £0.7 billion on capital EPE in 2017, compared with £0.5 billion in 2016. In both years, the majority of this capex related to what can be referred to as end-of-pipe. End-of-pipe capex in an environmental context represents investment in methods, technologies, processes or equipment designed to manage pollutants after their creation. This might include investment in plants or equipment that treat generated pollutants, such as an effluent treatment plant or exhaust air scrubbing system, or investment in ensuring their safe disposal, such as a solid waste compactor.

Integrated capex instead refers to investment in methods, technologies and equipment that are integrated within the businesses' overall activity, where the primary aim of the expenditure is to reduce any pollutants generated. The expenditure captured here includes only the element that specifically relates to the additional cost of the environmentally friendly process compared with a cheaper and less environmentally friendly alternative. An example here would be the difference in the cost to a business of purchasing more precise cutting machinery, that led to the production of smaller amounts of waste, compared with the business purchasing cheaper but less precise cutting machinery that might lead to the production of larger amounts of waste.

Table 1: Environmental protection expenditure by businesses, UK, 2016 and 2017

	£ billions	
	2016	2017
External operating expenditure	1.2	1.3
In house operating expenditure	0.5	0.5
End of pipe capital expenditure	0.4	0.7
Integrated capital expenditure	0.1	0.1
Total environmental protection expenditure	2.1	2.5

Source: Office for National Statistics – Environmental Protection Expenditure Survey

Notes

1. External operating expenditure refers to operating costs paid to external organisations for treatment, disposal or investigation relating to wastewater management, protection of ambient air and climate, solid waste management or other environmental-related external operating expenditure not elsewhere classified. [Back to table](#)
2. In-house operating expenditure refers to on-site management costs for the treatment, disposal or investigation relating to wastewater management, protection of ambient air and climate, solid waste management or other environmental-related external operating expenditure not elsewhere classified. [Back to table](#)
3. End-of-pipe capital expenditure refers to capital expenditure for methods, technologies, processes or equipment designed to collect, remove pollution and pollutants after their creation. [Back to table](#)
4. Integrated capex refers to investment in methods, technologies and equipment that are integrated within the business' overall activity, where the primary aim of the expenditure is to reduce any pollutants generated. [Back to table](#)
5. Types of environmental protection expenditure not elsewhere classified may include expenditure aimed at the protection of soil or groundwater, noise abatement, protection of biodiversity or protection against radiation. [Back to table](#)
6. Sub-totals may not sum to totals due to rounding. [Back to table](#)
7. All estimates are provided in current prices and are not adjusted for inflation. [Back to table](#)

5 . Wastewater management expenditure accounted for the largest proportion of total environmental protection expenditure by UK businesses in 2017

Expenditure on wastewater management activities (£1 billion) accounted for the largest proportion (40%) of all environmental protection expenditure (EPE) by UK businesses in 2017. It might be expected that most businesses would have some expenditure on wastewater management given that this includes use of water by employees and or business processes. Expenditure on wastewater management was mainly made up of external operating expenditure and end-of-pipe capital expenditure (Figure 3).

Expenditure on solid waste management was £0.9 billion in 2017, that is, 36% of total EPE by UK businesses. Of such operating expenditure (opex), 0.8 billion (85%) was external. Solid waste management includes the treatment, disposal and investigation of waste, including general waste such as paper and cardboard, as well as hazardous and non-hazardous waste.

The ratio of external to in-house opex reflects the choices of businesses to outsource to specialised contractors or manage the process internally. There was generally greater external opex than in-house opex in 2017, particularly for solid waste management activities, where around 88% of operating expenditure was paid to external providers. This suggests that businesses often do not have their own disposal systems for solid waste.

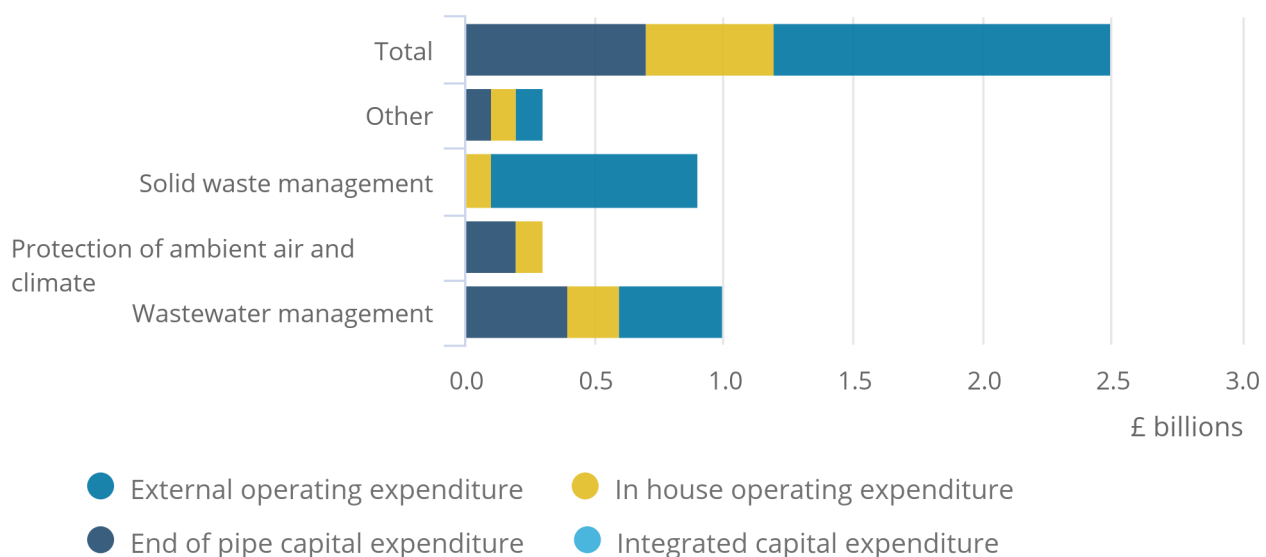
The ratio of end-of-pipe capital expenditure (capex) to integrated capex reflects the different measures that are taken to tackle each type of pollution. In 2017, almost all (98%) of businesses' wastewater management capex related to end-of-pipe investments rather than the additional cost of integrated environmentally friendly equipment. This might suggest that these industries focus on cleaning the by-product produced rather than reducing the amount of by-product generated during their production processes.

Figure 3: Just over half of all UK businesses' environmental protection expenditure in 2017 related to external operating expenditure

Industry environmental protection expenditure by activity and type, UK, 2017

Figure 3: Just over half of all UK businesses' environmental protection expenditure in 2017 related to external operating expenditure

Industry environmental protection expenditure by activity and type, UK, 2017



Source: Office for National Statistics – Environmental Protection Expenditure Survey

Notes:

1. Where expenditure for a particular activity and type is less than £0.1 billion, it is not shown. Total integrated capital expenditure is less than £0.1 billion.
2. Sub-totals may not sum to totals due to rounding.

Figure 4 provides a breakdown of the types of EPE made by businesses in each of the different industries surveyed.

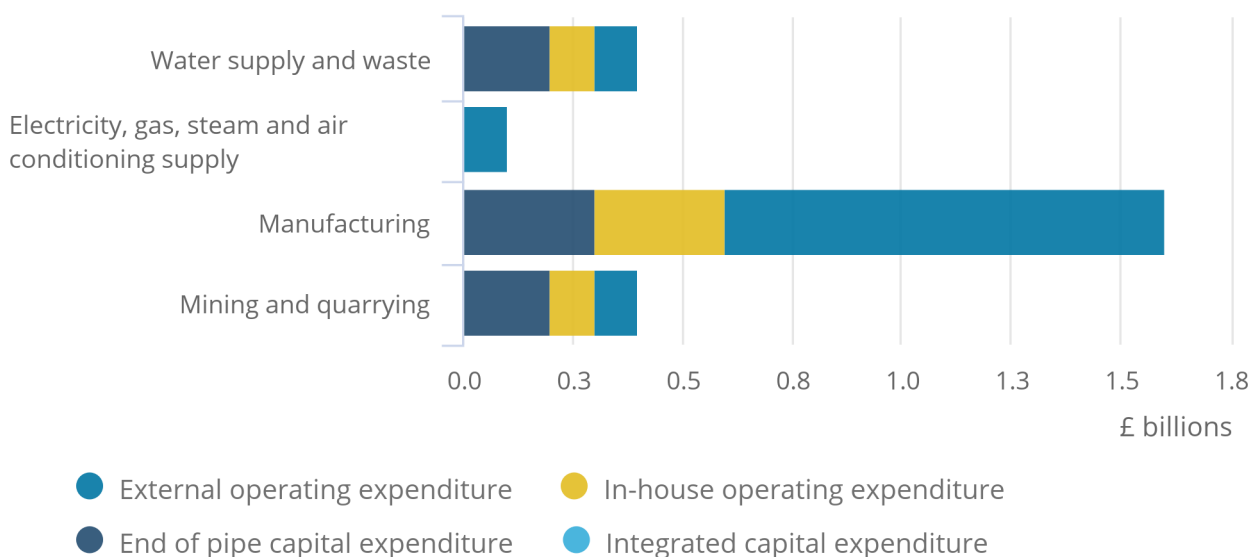
Businesses within the manufacturing industry spent a greater proportion (83%) of their EPE on opex than businesses within any other industry, the majority of which was made to external providers. By contrast, businesses operating within the mining and quarrying industry spent only 40% of their EPE on opex.

Figure 4: For businesses operating within the manufacturing industry, 83% of their environmental protection expenditure was on operating expenditure

Environmental protection expenditure by industry and type of expenditure, UK, 2017

Figure 4: For businesses operating within the manufacturing industry, 83% of their environmental protection expenditure was on operating expenditure

Environmental protection expenditure by industry and type of expenditure, UK, 2017



Source: Office for National Statistics – Environmental Protection Expenditure Survey

Notes:

1. Businesses are classified as operating in a particular industry according to the Standard Industrial Classification (SIC).
2. Where expenditure for a particular industry and type of expenditure is less than £0.1 billion, it is not shown.
3. Sub-totals may not sum to totals due to rounding.

6 . Environmental protection expenditure is monitored by the Sustainable Development Goals

[Sustainable Development Goals \(SDGs\)](#) were introduced in 2015 and are a set of 17 goals designed to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. [UK data for SDGs](#) are available on the online reporting platform.

In particular, environmental protection expenditure (EPE)-related activities are captured under the following targets:

- Target 9.4 – “By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes with all countries taking action in accordance with their respective capabilities”
- Target 12.6 – “Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle”

7 . Quality and methodology

This section contains important notes and definitions used in the calculation and production of environmental protection expenditure (EPE). The EPE accounts aim to assess the actual expenditure on environmental protection incurred by the total economy. Environmental protection activities are defined according to the [Classification of Environmental Protection Activity](#).

Measuring environmental protection expenditure by industry

Information on EPE by industry comes from an Office for National Statistics (ONS) survey, which has been dispatched annually since 2016. Prior to 2015, the EPE survey was commissioned by the Department for Environment, Food and Rural Affairs (Defra). Defra collected data in 1994 (pilot), 1997 and then annually between 1999 and 2013. Defra have published the [results from the Environmental Protection Expenditure Survey](#) for these years. Due to the migration from Defra to the ONS, no data were collected for 2014. Owing to methodological differences between Defra and the ONS, the results between the two surveys are not comparable.

The ONS surveys around 3,000 businesses from four Standard Industrial Classification (SIC) sections in the UK to obtain estimates of EPE by these industries. These SIC sections are:

- mining and quarrying (section B)
- manufacturing (section C)
- energy production (section D)
- water supply (section E)

In 2017, the response rate to the survey was 74%. Potential activity in other industries is not captured by the survey. As with any survey-based estimates, estimates are subject to a margin of error and should be interpreted with caution. Standard errors around all published estimates will be published with the next release of the full [ONS Environmental Accounts](#).

The survey collects information on both operating expenditure (opex) and capital expenditure (capex).

In 2016, a question was added to obtain estimates of external opex. Prior to this, information was only collected on in-house opex. External opex refers to operating costs paid to external organisations for the treatment and/or disposal or investigation of protection of ambient air and climate, wastewater management, waste management and other activities not elsewhere classified. Internal opex refers to on-site management costs for the treatment and/or disposal or investigation of protection of ambient air and climate, wastewater management, waste management and other activities not elsewhere classified.

The survey captures two types of capex: end-of-pipe and integrated. End-of-pipe capex in an environmental context represents investment in methods, technologies, processes or equipment designed to manage pollutants after their creation. This might include investment in plants or equipment that treat generated pollutants, such as an effluent treatment plant or exhaust air scrubbing system, or investment in ensuring their safe disposal, such as a solid waste compactor.

Integrated capex refers to investment in methods, technologies and equipment that are integrated within the business' overall activity, where the primary aim of the expenditure is to reduce any pollutants generated. The expenditure captured here includes only the element that specifically relates to the additional cost of the environmentally friendly process compared with a cheaper and less environmentally friendly alternative. An example here would be the difference in the cost to a business of purchasing more precise cutting machinery, that led to the production of smaller amounts of waste, compared with the business purchasing cheaper but less precise cutting machinery that might lead to the production of larger amounts of waste.

From 2016, the survey collected information on the profits from the disposals of any capital assets that had been used for environmental protection purposes; estimates of which are available in the [Environmental protection expenditure: industry](#) dataset accompanying this bulletin.

Revisions to environmental protection expenditure survey estimates

This bulletin contains revisions to 2016 figures from the Environmental Protection Expenditure Survey since they were published in June 2018. Revisions are not uncommon during the first few years of a survey being conducted. Reasons include:

- the incorporation of additional data received from businesses who have been sampled in multiple years of the survey
- changes to data as a result of businesses revising their previous submissions
- developments in methodology and changes to the questionnaire

Table 2 allows a comparison of the latest 2017 estimates of UK industry environmental protection expenditure to revised and original 2016 estimates. Revisions may continue to be made in future rounds of the survey as the survey matures.

Table 2: Revisions to Environmental Protection Expenditure Survey estimates, UK, 2016 and 2017

	£ billions		
	2017	2016 revised	2016 original
External operating expenditure	1.3	1.2	2.1
Internal operating expenditure	0.5	0.5	0.8
End of pipe capital expenditure	0.7	0.4	0.2
Integrated capital expenditure	0.1	0.1	0.1
Total environmental protection expenditure	2.5	2.1	3.2

Source: Office for National Statistics – Environmental Protection Expenditure Survey

Notes

1. External operating expenditure refers to operating costs paid to external organisations for treatment, disposal or investigation relating to wastewater management, protection of ambient air and climate, solid waste management or other environmental-related external operating expenditure not elsewhere classified. [Back to table](#)
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Measuring environmental protection expenditure by government

Information on EPE by general government (central government and local government) comes from the [General government annual expenditure: ESA Table 11](#). Data are available from 1995. The annual UK government expenditure is broken down by function using the Classification of the functions of government (COFOG). A Eurostat guide to COFOG tables is available in the [Glossary: Classification of the functions of government \(COFOG\)](#), which explains the definitions and codes associated with these tables. For each environmental activity provided in the table, for example, GF0501 solid waste management, the value of investment, current expenditure and subsidies are summed to produce a total. The [YBHA series](#) of gross domestic product (GDP) at current prices is used when calculating general government EPE as a proportion of GDP.