

Environmental protection expenditure (EPE) accounts QMI

Quality and Methodology Information (QMI) report for environmental protection expenditure accounts estimates, detailing the strengths and limitations of the data, methods used, and data uses and users.

Contact:
Sophie Barrand and Natasha
Bird
environment.accounts@ons.gov.
uk
+44 1633 456525

Release date:
3 July 2023

Next release:
To be announced

Table of contents

1. [Output information](#)
2. [About this Quality and Methodology Information report](#)
3. [Important points](#)
4. [Quality summary](#)
5. [Quality characteristics of the environmental protection expenditure data](#)
6. [Methods used to produce the environmental protection expenditure data](#)
7. [Other information](#)

1 . Output information

National Statistic	
Product name	Environmental protection expenditure (EPE) accounts
Frequency	Annual
Geographic coverage	UK
Last revised	3 July 2023

2 . About this Quality and Methodology Information report

This quality and methodology report contains information on the quality characteristics of the data (including the [Code of Practice for Statistics](#) from the [UK Statistics Authority](#)) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- decide suitable uses for the data
- reduce the risk of misusing data

3 . Important points

This report provides users of the [environmental protection expenditure \(EPE\) statistics](#) with information on the quality and appropriate use of these estimates.

The EPE statistics form part of the [UK Environmental Accounts](#), as produced by the Office for National Statistics (ONS).

This is part of a set of reports covering UK Environmental Accounts estimates. There are quality and methodology information reports available for other UK Environmental Accounts estimates, including:

- [air emissions](#)
- [energy use](#)
- [material flows](#)
- [environmental goods and services sector](#)
- [environmental taxes](#)

The ONS also runs the EPE survey, estimates from which are used as a data source in the EPE accounts. The EPE survey has its own [Quality and Methodology Information report](#).

4 . Quality summary

Overview

The United Nations (UN) [System of Environmental Economic Accounting \(SEEA\)](#), together with the UN [System of National Accounts \(SNA\)](#) and the [European System of Accounts \(ESA\)](#), provides a framework for producing internationally comparable statistics on the environment and its relationship with the economy.

Environmental protection expenditure (EPE) statistics show how much different sectors spend on reducing or eliminating pressures on the environment, such as air or water pollution.

SEEA and Eurostat guidelines have been used by the Office for National Statistics (ONS) to develop the UK's EPE accounts.

Estimates include estimates of output related to environmental protection by general government, specialist businesses and other businesses. There are also estimates of use of environmental protection services by households, transfers between different institutional sectors, and the total supply of environmental protection services for resident users. See [Section 6](#) for more information.

Data are provided by [Classifications of Environmental Protection Activities \(CEPA\)](#), the codes and names of which are provided in each data table. The CEPA classifications enable comparisons across different countries, which are usually European as Eurostat has mandated the compilation of EPE accounts by EU members for some years. CEPA map to the UK's [Standard Industrial Classification 2007](#), which is used to compile the estimates. The SIC 2007 is the UK's classification system for businesses and enables comparisons with other UK data.

The estimates are available for download as Microsoft Excel files from the [Environmental Accounts page](#) of the ONS website.

The main data sources for the EPE accounts are Supply and Use Tables, the Annual Business Survey, the EPE survey, and the European System of Accounts, Table 11 (general government annual expenditure). These are all produced by the ONS. A [separate QMI is available](#) for the EPE survey. See [Section 6](#) for more information on data sources and methodology.

Uses and users

As a result of the data's compatibility with the boundaries and definitions used within the UN System of National Accounts (SNA), the EPE data provide a useful input to economic analysis.

The potential uses for data come from a variety of international organisations, UK and other governments, and the research community.

The [EPE handbook](#) from Eurostat explains some potential uses of the data. Eurostat also updates [an annual article](#) exploring the EPE data as reported by European countries. Following the UK's departure from the EU, UK data are now not captured in this article, but the analysis is replicable.

The Organisation for Economic Cooperation and Development (OECD) publishes EPE estimates in [an online database](#). These are included in [the OECD's work on green growth indicators](#).

Strengths and limitations

The strengths of the UK EPE estimates include:

- the use of National Accounts source data, which increases the quality of the estimates and the possibilities of using the estimates with other economic data in analysis
- the application of a well-established set of [international guidelines](#), allowing for comparability between countries
- the inclusion of a wide range of different data, with estimates of EPE by businesses, government and households, with breakdowns by type of environmental protection

The limitations of the EPE estimates include:

- a time lag of three years between the latest reference year in the estimates and publication, because of the time lag in the availability of source data – for example, 2019 estimates were published in 2022
- some gaps in coverage – for example, there are no data on EPE by non-profit institutions serving households

5 . Quality characteristics of the environmental protection expenditure data

This section provides a range of information that describes the quality and characteristics of the data and identifies overlaps with other estimates. It also explains what specific estimates are provided and what definitions are used.

Accuracy

As a result of the wide range of source data used to compile the environmental protection expenditure (EPE) accounts, it is not possible to produce measures of accuracy, such as confidence intervals.

The data used are high quality and often come from the National Accounts. There are limited comparator data available. Revisions to final EPE estimates are made to the whole time series every year, to reflect updates in the source data. Such revisions tend to be small.

One of the sources for the estimates is the [EPE survey](#), which was migrated from the Department for Environment, Food and Rural Affairs (Defra) to the Office for National Statistics (ONS). Following this migration, no data were collected in 2014, leading to a gap in the series. It is also difficult to compare data before and after 2014 and 2015 because of methodological challenges to the survey.

While compiling the EPE estimates, quality assurance processes are completed to ensure accurate and consistent compilation of the EPE accounts. Processes include built-in automated checks. For example, automated checks examine subtotal to total consistency and year-on-year differences in estimates.

Coherence and comparability

There are limited data with which to compare EPE estimates. There is some overlap with the [environmental goods and services sector \(EGSS\) estimates](#), which measure output and other variables.

EGSS measures 17 activities, including waste, wastewater, in-house environmental activities, and managerial activities of government bodies. These four activities have some conceptual similarities with some of the estimates in the EPE accounts.

Wastewater and waste use data from Supply and Use Tables for [Standard Industrial Classifications](#) (SICs) 37 and 38, respectively, excluding 38.3 (materials recovery, which includes recycling). These are the same data that are used for the EPE estimates of output by specialist businesses (which also use some additional data to measure EPE).

In-house environmental activities in EGSS and output by other businesses in EPE both use data from the [EPE survey](#), although different methodologies are applied to these data.

Managerial activities of government bodies in EGSS and output by general government in EPE use data from the European System of Accounts (ESA) and Blue Book on government expenditure. The estimates differ in that EPE includes output for own final use whereas EGSS excludes it. EGSS also includes government output over a smaller number of [Classifications of Environmental Protection Activities](#) (CEPA) than EPE. This is consistent with guidance in Eurostat's [EPE](#) and [EGSS](#) handbooks.

Data on EPE by other European countries are [published by Eurostat](#). The use of the United Nations (UN) [System of Environmental Economic Accounting \(SEEA\)](#) means that comparisons with other countries are possible (although methodological and coverage differences may apply).

The ONS publish estimates of EPE and output by general government as part of the EPE accounts. We also publish a [separate general government EPE table](#), which is an older dataset. These estimates are different. For the EPE accounts, using international statistical guidance, we integrate estimates of environmental protection services paid for and delivered by government with those from businesses and households. For the other dataset, we aggregate relevant data from the ESA Table 11 (subsidies, current expenditure and investment) – there is no attempt to balance it with data from businesses and households.

Timeliness and punctuality

EPE data are published annually, in May or June, and currently on a year-three basis. The release, and any articles associated with the EGSS estimates, are [pre-announced on the ONS website](#).

The [dataset for the EPE accounts](#) was newly published in June 2022, following a change to how the ONS publishes EPE data following the UK's departure from the EU. From 2023 onwards, all previous datasets in the new format will be available.

Concepts and definitions

The UN [System of Environmental Economic Accounting \(SEEA\)](#), together with the UN [System of National Accounts \(SNA\)](#) and the [European System of Accounts \(ESA\)](#), provides a framework for producing internationally comparable statistics on the environment and its relationship with the economy.

EPE statistics show how much different sectors spend on reducing or eliminating pressures on the environment, such as air or water pollution. More details on the scope of EPE are available in the [2017 EPE handbook from Eurostat](#).

The full definition of EPE from the handbook is:

“All activities and actions which have as their main purpose the prevention, reduction and elimination of pollution and of any other degradation of the environment. Those activities and actions include all measures taken in order to restore the environment after it has been degraded. Activities such as energy and material saving are only included to the extent that they mainly aim at environmental protection. An important example is recycling, which is included only to the extent that it constitutes a substitute for waste management.”

The [SEEA Central Framework](#) explains the purpose of the EPE accounts:

“To enable identification and measurement of society’s response to environmental concerns through the supply of and demand for environmental protection services and through the adoption of production and consumption behaviour aimed at preventing environmental degradation.”

The accounts measure output of environmental protection services, often also known as final consumption expenditure. This is based on [System of National Accounts definitions adopted by Eurostat](#) and others. Data on intermediate consumption and gross fixed capital formation are also used in the compilation of the accounts, to estimate total EPE by sector.

The EPE accounts are split into six tables. These are:

- output by general government
- output by specialist businesses
- output by other businesses
- household use
- transfers paid and received
- total supply of environmental protection goods and services and total environmental protection expenditure

Some of these tables are split into several further tables. See [Section 6](#) for more information.

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 might be small compared with the cost of introducing new equipment.

Geography

Estimates are available at UK level on a residency basis – that is, including activity of UK-registered businesses that may take place outside of the UK, and excluding activity in the UK of businesses that are registered abroad.

6 . Methods used to produce the environmental protection expenditure data

The environmental protection expenditure (EPE) accounts are compiled in accordance with the [United Nations \(UN\) System of Environmental Economic Accounting \(SEEA\)](#), which closely follows national accounting standards set out in the [UN System of National Accounts \(SNA\)](#). At the Office for National Statistics (ONS), we used the 2017 EPE handbook from Eurostat to develop our methodology to estimate EPE, and to implement further improvements.

The guidance acknowledges that individual countries will need to adapt the methodology to meet their specific needs, in line with data sources available.

The UK estimates of EPE are provided in six main data tables. The data sources and methodology for each are detailed in the next subsections.

Output by general government

These estimates use data from Blue Book and the European System of Accounts (ESA) on expenditure by general government. The ONS provides these sources. Non-market and market output are included, including output for own final use.

Estimates are provided across all [Classifications of Environmental Protection Activities](#) (CEPA). Estimates for CEPAs 1, 4, 5 and 7 are aggregated because of their structure in the source data.

International guidance on EPE accounts suggests that activity by non-profit institutions serving households (NPISH) should also be included in these estimates. The ONS currently do not have relevant data on NPISH, but we will review this as part of our development work for the accounts.

Data are available from 2010 onwards. This is because we use estimates from the ONS EPE survey, which covers 2015 onwards, and the Defra version of the survey, which covers 2010 to 2013. An average of the previous three years is used to estimate 2014 data. For 2016 onwards, the ONS changed the survey questionnaire, which means that comparing 2015 and 2016 data is difficult. Overall, comparisons between years which use different methodologies should be undertaken with caution. EPE by other businesses is small compared to specialist businesses, so both survey estimates are used for completeness. We will further investigate our use of these two surveys.

Output by specialist businesses

These estimates use data from the Annual Business Survey, Supply and Use Tables, and data on gross fixed capital formation. The ONS provides these sources.

The estimates measure output from businesses that operate in [Standard Industrial Classifications](#) (SICs) 37, 38 (excluding 38.3), and 39. SIC 37 is "Sewerage". SIC 38 is "Waste collection, treatment and disposal activities; materials recovery". SIC 39 is "Remediation activities and other waste management services".

For SIC 38, estimates of activity relating to "materials recovery", which includes recycling, are removed. These are captured in SIC 38.3. This is because recycling is related to resource management rather than environmental protection.

Estimates are provided for:

- CEPA 2, which maps directly to SIC 37
- CEPA 3, which maps directly to SIC 38 (excluding SIC 38.3)
- CEPA 4, which maps directly to SIC 39

Data are available from 2006 onwards.

Output by other businesses

These estimates use data from the EPE survey, which is run by the ONS.

The survey samples businesses that operate in these industries:

- mining and quarrying (SIC Section B)
- manufacturing (SIC Section C)
- electricity, gas, steam and air conditioning supply (SIC Section D)
- water collection, treatment and supply (SIC Section E, Division 36)

These industries are sampled because they form the target population identified in the [2017 EPE handbook from Eurostat](#). See the [EPE survey QMI](#) for more information.

These estimates capture expenditure on operating costs and investment for the purpose of environmental protection by businesses whose primary activity is not in environmental protection services.

Data are available from 2010 onwards. This is because we use estimates from the ONS EPE survey, which covers 2015 onwards, and the Department for Environment, Food and Rural Affairs (Defra) version of the survey, which covers 2010 to 2013. An average of the previous three years is used to estimate 2014 data. From 2016 onwards, the ONS changed the survey questionnaire, which means that comparing 2015 and 2016 data is difficult. Overall, comparisons between years that use different methodologies should be undertaken with caution. EPE by other businesses is small compared with specialist businesses, so both survey estimates are used for completeness. We will further investigate our use of these two surveys.

Household use

These estimates use data from Supply and Use Tables, which are produced by the ONS. They provide estimates of households' use of wastewater and waste management services.

SICs 37 and 38 are used to identify the relevant data, which map directly to CEPAs 2 and 3, respectively.

SIC 38 includes SIC 38.3, which is "materials recovery". This includes recycling activities. These activities are excluded in EPE estimates where possible. The available data do not currently allow for this activity to be removed from estimates of household use of waste management services. However, the share of this activity of total household use is very small. Future development work on these accounts will review whether this split is possible.

Data are available from 2006 onwards.

Transfers paid and received

These estimates use source data from the ESA on government expenditure, to identify and aggregate financial transfers between different groups of actors. These include general government, businesses and the rest of the world.

These estimates are included because they help identify expenditure on environmental protection that could otherwise be excluded from the accounts. The [EPE handbook](#) explains this in more detail, on page 133.

Estimates are provided in terms of:

- transfers paid from general government
- transfers received from the rest of the world to general government
- transfers received from the rest of the world and general government to businesses
- transfers received from general government to the rest of the world

For transfers paid, estimates are provided by CEPAs 1 to 9. Estimates for CEPAs 1, 4, 5 and 7 cannot be published separately because of limitations of the source data. For all transfers received, it is not possible to provide estimates by individual CEPAs. Estimates of transfers are provided as totals only.

The [EPE handbook](#) explains in more detail what each transfer is and what it could include, on pages 134 to 135.

Data are available from 2006 onwards for transfers paid and 2014 onwards for transfers received.

Total supply of environmental protection goods and services and total environmental protection expenditure

Total supply of environmental protection goods and services is calculated based on the previous five tables:

$(\text{output} + \text{imports} + \text{VAT}) - (\text{exports} + \text{intermediate consumption})$

Output includes output from general government, specialist businesses and other businesses. These data are from the first three data tables in the dataset.

Imports and exports include activity in SICs 37, 38 (excluding 38.3), and 39. VAT data are also for activity in SICs 37, 38 (excluding 38.3), and 39. These data are all from Supply and Use Tables.

Intermediate consumption is for government and specialist businesses.

Total EPE by government, households and businesses is calculated based on the previous five tables and the total supply estimate.

The formula to calculate total EPE by government is:

$(\text{government output} + \text{government gross fixed capital formation and acquisition less disposal of non-produced assets} + \text{transfers received from government to rest of the world}) - \text{transfers received from rest of the world to government}$

Total EPE by households is the same as the estimates in the Household use table.

The formulae to calculate total EPE by businesses are:

1. $\text{total supply} - (\text{government output} + \text{household use}) = \text{intermediate consumption for all EPE, which is all allocated to businesses as per international guidance on calculating EPE}$
2. $\text{intermediate consumption} + \text{gross fixed capital formation by specialist and other businesses} = \text{total EPE by businesses}$

The estimates of EPE by these three sectors are then summed to estimate total EPE in the UK.

For total supply, data are available for 2010 onwards. For total EPE, data are also available from 2010 onwards. This is because these are the earliest years that all the required source data are available – however, for total EPE, certain data on transfers are not available for 2010 to 2013, so the estimate for these years is incomplete. These transfers are a very small proportion of the total in years for which we do have data.

How we disseminate the data

The ONS previously transmitted our estimates of EPE to Eurostat for publication in their database. The Eurostat database will now not be updated for the UK, so the ONS will publish the latest estimates. These can be found on the [Environmental Accounts page](#) on the ONS website.

Data on EPE are also collected and published by the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF). The OECD publishes [OECD.Stat](#), which is an online tool to view and download its databases. The IMF publishes the [Climate Indicators Dashboard](#). The IMF uses government expenditure data, so the estimate of EPE is not directly comparable with the ONS accounts.

7 . Other information

More information on environmental protection expenditure (EPE) and other topics related to UK Environmental Accounts is available:

[UK Environmental Accounts](#)

[United Nations \(UN\) System of Environmental Economic Accounting \(SEEA\)](#)

[Eurostat handbook on the compilation of environmental protection expenditure estimates](#)

[Environmental protection expenditure \(EPE\) survey QMI](#)