

Compendium

Chapter 12: UK Environmental Accounts



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1 . UK Environmental Accounts

Environmental accounts are:

- “satellite accounts” to the main National Accounts
- compiled in accordance with the System of Environmental-Economic Accounting (SEEA), which closely follows the United Nations System of National Accounts (SNA)

Environmental accounts measure:

- the impact of the economy on the environment
- how the environment contributes to the economy by using the accounting framework and concepts of the national accounts

Environmental accounts are used to:

- inform sustainable development policy
- model impacts of fiscal or monetary measures
- evaluate the environmental impacts of different sectors of the economy

Environmental accounts data:

- are mostly provided in units of physical measurement (mass or volume)
- can be provided in monetary units, where this is the most relevant or only data available

[Tables 12.1 to 12.5 \(156.5 Kb Excel sheet\)](#) show estimates of oil and gas reserves, energy consumption, atmospheric emissions and material flows. More data, information and other environmental accounts (including fuel use, environmental goods and services sector, waste, water use, environmental taxes, environmental protection expenditure, and experimental natural capital accounts) can be found on the [UK Environmental Accounts release page](#) on our website.

2 . Oil and gas reserves

[Table 12.1 \(156.5 Kb Excel sheet\)](#) presents non-monetary estimates of the oil and gas reserves and resources in the UK. “Resources” are minerals that are potentially valuable and could eventually be extracted, whereas “reserves” refer to discovered minerals that are recoverable and commercially viable.

Reserves can be proven, probable or possible depending on the confidence level:

- proven reserves (based on the available evidence) are virtually certain to be technically and commercially producible, that is, have a better than 90% chance of being produced
- probable reserves are not yet proven but have a more than 50% chance of being produced
- possible reserves cannot be regarded as probable at present, but are estimated to have a significant (but less than 50%) chance of being technically and commercially producible

Oil is defined as both oil and the liquids that can be obtained from gas fields. Shale oil is not included in the estimates. The total (discovered and undiscovered) of oil reserves and resources in 2013 was estimated to be between 857 and 2,415 million tonnes (mt). Between 2012 and 2013, the upper and lower range increased and decreased respectively by 0.3%.

Gas includes gas expected to be available for sale from dry gas fields, gas condensate fields, oil fields associated with gas and a small amount from coal bed methane projects. Shale gas is not included in these estimates. These reserves include onshore and offshore discoveries, but not flared gas or gas consumed in production operations. Total gas reserves and resources were estimated to be between 598 and 1,647 billion cubic metres (bcm) in 2013. The upper and lower ranges decreased by 2.6% and 3.7% respectively in 2013 compared to 2012.

3 . Energy consumption

[Table 12.2 \(156.5 Kb Excel sheet\)](#) presents energy consumption by industry for the UK. Energy consumption is defined as the use of energy for power generation, heating and transport. This is essential to most economic activities, for example, as input for production processes. "Direct use of energy" refers to the energy content of fuel for energy at the point of use, allocated to the original purchasers and consumers of fuels. For "reallocated use of energy", the losses incurred during transformation¹ and distribution² are allocated to the final consumer of the energy rather than incorporating it all in the electricity generation sector.

Total energy consumption of primary fuels and equivalent was 213.3 million tonnes of oil equivalent (Mtoe) in 2013, 0.9% lower than in 2012. Fossil fuels remained the dominant source of energy supply in 2013, however, less primary fuel was consumed than in previous years. Energy consumption from fossil fuels in 2013 was at the lowest level since the time series began (in 1990) at 184.7 Mtoe. This represented 86.6% of total energy consumption.

Although fossil fuels are the main source of energy for consumption, other sources (including nuclear, net imports, and renewable and waste sources) are becoming increasingly important. Total energy consumption from other sources was 28.6 Mtoe in 2013, 9.3% higher than in 2012. This included 15.4 Mtoe of nuclear, 1.2 Mtoe from net imports and 11.9 Mtoe from renewable and waste sources.

4 . Atmospheric emissions

[Tables 12.3 and 12.4 \(156.5 Kb Excel sheet\)](#) show emissions of greenhouse gases, acid rain precursors (ARP) and other pollutants by industry for the UK.

Atmospheric emissions of greenhouse gases are widely believed to contribute to global warming and climate change. In 2013, emissions of greenhouse gases were estimated to be 643.1 million tonnes carbon dioxide equivalent (Mt CO₂e), the lowest level since the series began in 1990. Across the time series, the largest annual fall in emissions of greenhouse gases occurred in 2009, following the onset of the economic downturn in 2008, when emissions decreased by 8.5%. Between 2012 and 2013, emissions decreased by 13.5 Mt CO₂e (2.0%). Factors underpinning this fall include a reduction in coal use by power stations and a fall in emissions from landfill.

Carbon dioxide (CO₂) is the dominant greenhouse gas, accounting for 84.4% of the UK's total greenhouse gas emissions in 2013. Methane (CH₄) accounted for 8.7%, nitrous oxide (N₂O) for 4.2%, and fluorinated gases comprised the remaining 2.6%.

Acid rain can have harmful effects on the environment and is caused primarily by emissions of sulphur dioxide (SO₂), nitrogen oxide (NO_x) and ammonia (NH₃). For comparability, all figures are weighted according to their acidifying potential, and presented as sulphur dioxide equivalents (SO₂e). ARP emissions have decreased sharply over the last 2 decades and fell to 1.9 million tonnes of SO₂e in 2013. Between 2012 and 2013, ARP emissions fell by 8.2%.

Emissions of all heavy metal pollutants have declined since 1990 (when the series began). The most notable reduction was in emissions of lead, which fell by 97.8%, from 2,897.1 tonnes in 1990 to 64.4 tonnes in 2013. This was mostly due to the decrease in the use of leaded petrol, the marketing of which was prohibited within the EU from 2000.

5 . Material flows

[Table 12.5 \(156.5 Kb Excel sheet\)](#) presents economy-wide material flow accounts, which estimate the physical flow of materials through the UK economy. The quantity of materials extracted in the UK has been gradually declining and fell to 442.2 million metric tonnes in 2012. However, between 2012 and 2013, total domestic extraction increased to 448.7 million tonnes. This was driven by increases in the extraction of biomass products.

Biomass includes material of biological origin that is not from fossil, such as crops, wood and wild fish catch. In 2013, 162.6 million tonnes were extracted, 8.5% higher than in 2012 (149.8 million tonnes). Of this, crop residues, fodder crops and grazed biomass accounted for 70.9% (115.2 million tonnes).

Non-metallic minerals are mainly construction and industrial minerals, including limestone and gypsum, sand and gravel, and clays. The extraction of non-metallic minerals has considerably declined since the time series began in the early 1990's. In particular, levels fell sharply in 2008 and 2009, which can be largely attributed to the global economic downturn.

Fossil energy materials and carriers include coal, peat, crude oil and natural gas. Since 2000, extraction has continually decreased and fell to 90.3 million tonnes in 2013, 10.1% lower than in 2012 (100.5 million tonnes). The decline in the extraction of fossil energy materials is due primarily to a drop in North Sea oil and gas production.

Metal ores include iron and non-ferrous metals. Each year, small quantities of metal ores are extracted in the UK, although this has notably decreased over the past 2 decades. Iron was extracted until 2008, but is now no longer produced. In 2013, just 1.1 thousand tonnes of metal ores were extracted in the UK.

The gap between physical imports and exports is widening. Imports sharply decreased in 2009, but have since increased to pre-recession levels. In 2013, 293.5 million tonnes of materials were imported, 56.7% of which was fossil energy materials and carriers, 19.9% was biomass and biomass products, 12.9% was metal ores, and the remainder consisted of non-metallic minerals and other products. Despite an increase in 2010, physical exports have been gradually declining. In 2013, 154.3 million tonnes of materials were exported, of which 54.9% was fossil energy materials and carriers.

The Physical Trade Balance (PTB) shows the relationship between imports and exports and is calculated by subtracting the weight of exports from the weight of imports.³ The UK has a positive PTB, meaning that more materials and products are imported than are exported. The PTB generally increased until 2007, but then fell in 2008, 2009 and 2010 during the economic downturn. However, the PTB has since increased and peaked at 139.3 million tonnes in 2013. In 2013, the total mass of imports was almost double the total mass of exports. The widening gap between physical imports and exports suggests that the UK is becoming more reliant on the production of materials in other countries.

Direct Material Input (DMI) (domestic extraction plus imports) measures the total amount of materials that are available for use in the economy.

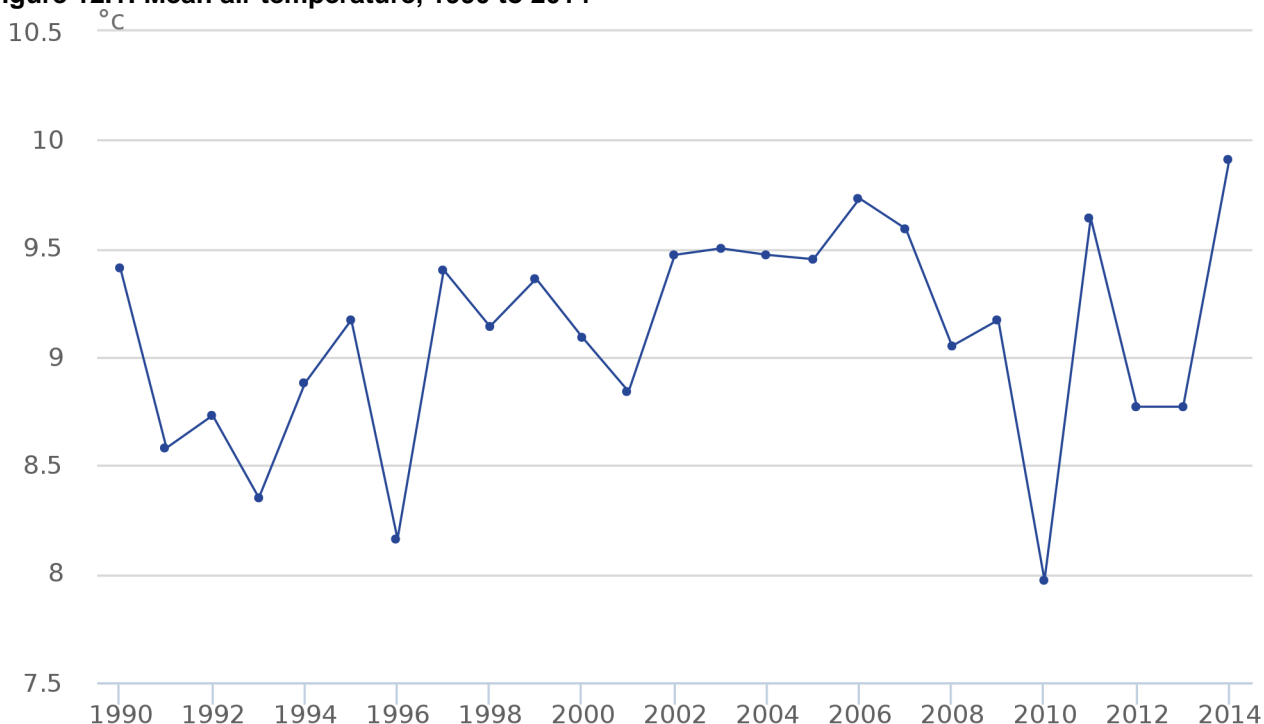
Domestic Material Consumption (DMC) (domestic extraction plus imports minus exports) measures the amount of materials used in the economy, and is calculated by subtracting exports from DMI.

DMI and DMC have gradually declined since the start of the economic downturn in 2008. This indicates that fewer material resources were being used and consumed in the UK economy. DMI and DMC fell most sharply in 2009 from the previous year, by 10.7% and 11.3% respectively. However, DMI and DMC increased in 2013 compared with 2012 to 742.2 million tonnes (1.8%) and 588.0 million tonnes (2.8%) respectively.

6 . Temperature

Figure 12.1 shows the change in mean air temperature from 1990 to 2014. This measure helps to contextualise some of the changes observed across the environmental accounts. For example, the average temperature fell to 8.0 degrees Celsius (°C) in 2010 from 9.2°C in 2009, which contributed to the increases in energy consumption and greenhouse gas emissions observed during that year. At the same time, GDP started to recover following the economic downturn, which may also explain the increases in consumption and emissions.

Figure 12.1: Mean air temperature, 1990 to 2014



Source: Met Office

7 . Tables

[Chapter 12 - UK Environmental Accounts reference tables \(156.5 Kb Excel sheet\)](#)

8. Background notes

1. We would welcome your feedback on this publication. If you would like to get in touch please contact us via email: blue.book.coordination@ons.gsi.gov.uk

2. As part of our user consultation, we are conducting a [Blue Book survey](#). The aim of the survey is to find out:
 - how you use our statistics
 - your understanding of the data published
 - your views on the quality of the publication

Your responses will help us improve some of our most important products. We will analyse the responses and publish a summary of the results over the forthcoming months.

The survey will take about 10 minutes to complete and will close on 04 December 2015. All answers will remain anonymous. Our [confidentiality statement](#) has further details.

3. This release includes data available up to 2014. Data are consistent with [Index of Production](#), published on 07 October 2015, the current price trade in goods data within UK Trade, published on 09 October 2015 and [Balance of Payments](#), [Quarterly National Accounts](#) and [United Kingdom Economic Accounts](#), published on 30 September 2015.
4. In line with the [National Statistics Quality Review \(NSQR\): Review of National Accounts and Balance of Payments](#), we have published a [response to National Statistics Quality Review \(NSQR\) Series \(2\) Report No. 2: Review of National Accounts and Balance of Payments](#) on our website.
5. On 13 July 2015 users of national accounts were invited to respond to an informal consultation on the national accounts medium-term work plan, which lays out a proposed set of priorities for the next 3 years. This consultation closed on 25 September 2015. It followed a previous work plan for national accounts and related outputs following the consultation held in 2013.

We will publish the final report, National Accounts Medium-Term Workplan, on our website by the end of November 2015.
6. We maintain a [Special Events Calendar](#). Special events are events that are identifiable; they do not recur on a regular cycle (so are not targeted by seasonal adjustment) and have the potential to have an impact on statistics. As explained in our [Special Events policy](#), it is not possible to separate the effects of special events from other changes in the series.
7. The UK Statistics Authority published [2 new assessment reports on the Annual and Quarterly National Accounts and Supply and Use Tables and Input-Output Tables](#) on 25 February 2015. These are available on the UK Statistics Authority website.
8. In order to implement improvements reflected in the European System of Accounts 2010 (ESA 2010), we will introduce a new survey to collect purchases data, and have published an [article detailing our intentions](#), along with a [high level project plan](#).
9. We regularly publish National Accounts [methodological information and articles](#) to provide more detailed information on developments within the national accounts. This includes supplementary analyses of data to help with the interpretation of statistics and guidance on the methodology used to produce the national accounts.
10. The UK national accounts are produced under internationally agreed guidance and rules set out principally in the [European System of Accounts \(ESA 2010\)](#) and the accompanying [Manual on Government Deficit and Debt- Implementation of ESA 2010 – 2014 edition \(MGDD\)](#).
11. In the UK, we are responsible for the application and interpretation of these rules. Therefore we make [National Accounts classification decisions](#) based upon the agreed guidance and rules.
12. We publish a monthly [Economic Review](#), giving economic commentary on the latest GDP estimate and our other economic releases. The next article will be published on 3 November 2015.
13. Common misinterpretations of this series:
 - expectations of accuracy and reliability in early estimates are often too high

- revisions are an inevitable consequence of the trade-off between timeliness and accuracy
- early estimates are based on incomplete data

Very few statistical revisions arise as a result of “errors” in the popular sense of the word. All estimates, by definition, are subject to statistical “error”. In this context the word refers to the uncertainty inherent in any process or calculation that uses sampling, estimation or modelling. Most revisions reflect either the adoption of new statistical techniques or the incorporation of new information which allows the statistical error of previous estimates to be reduced. Only rarely are there avoidable “errors”, such as human or system failures, and such mistakes are made clear when they do occur.

- Estimates for the most recent quarters are provisional and are subject to revision in the light of updated source information.
- Our revisions to economic statistics brings together our work on revisions analysis, linking to articles, revisions policies and documentation from the Statistics Commission's report on revisions.
- Latest copies of our releases and [Publications](#) are on our website.
- Details of the policy governing the release of new data are available from the [media relations office](#).
- We are committed to ensuring all information provided is kept strictly confidential and will only be used for statistical purposes. Further details regarding confidentiality can be found in the respondent charters for [businesses](#) and [households](#), on our website.
- You can follow us on [Twitter](#) and [Facebook](#).
- National Statistics are produced to high professional standards set out in the [UK Statistics Authority's Code of Practice for Official Statistics](#). They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference.
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- Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

These National Statistics are produced to high professional standards and released according to the arrangements approved by the UK Statistics Authority.