

Article

# Material footprint in the UK: 2018

The UK's material footprint captures domestic and foreign extraction of materials needed to produce products used in the UK. This article presents updated estimates.

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## Table of contents

1. [Main points](#)
2. [Domestic material consumption and the UK's material footprint](#)
3. [The material footprint by material group](#)
4. [Country contributions to the UK footprint](#)
5. [Revisions](#)
6. [Material footprint data](#)
7. [Glossary](#)
8. [Data sources and quality](#)
9. [Related links](#)

# 1 . Main points

- The UK's material footprint was estimated as 971 million tonnes in 2018, equivalent to 14.6 tonnes per person.
- The footprint reached its highest level in 2004, and since then has declined by 34%, driven by declines in 2008 and 2009 following the economic downturn.
- The UK is increasingly a net importer of materials – domestic extraction accounted for 40% of material footprint in 1997; by 2018, this had fallen to 27%.
- Significant contributors to the footprint in 2018 include the UK, China, India, and the European Union.
- The contribution of fossil fuels to the footprint has declined by 58% since 1997, from 427 million tonnes to 178 million tonnes in 2018.

## 2 . Domestic material consumption and the UK's material footprint

The UK's domestic material consumption (DMC) was 569 million metric tonnes in 2018. DMC measures the total amount of materials directly used by an economy and is calculated as domestic extraction plus imports and minus exports. The UK's DMC has remained relatively stable since 2000, apart from a fall in 2008 because of the economic downturn.

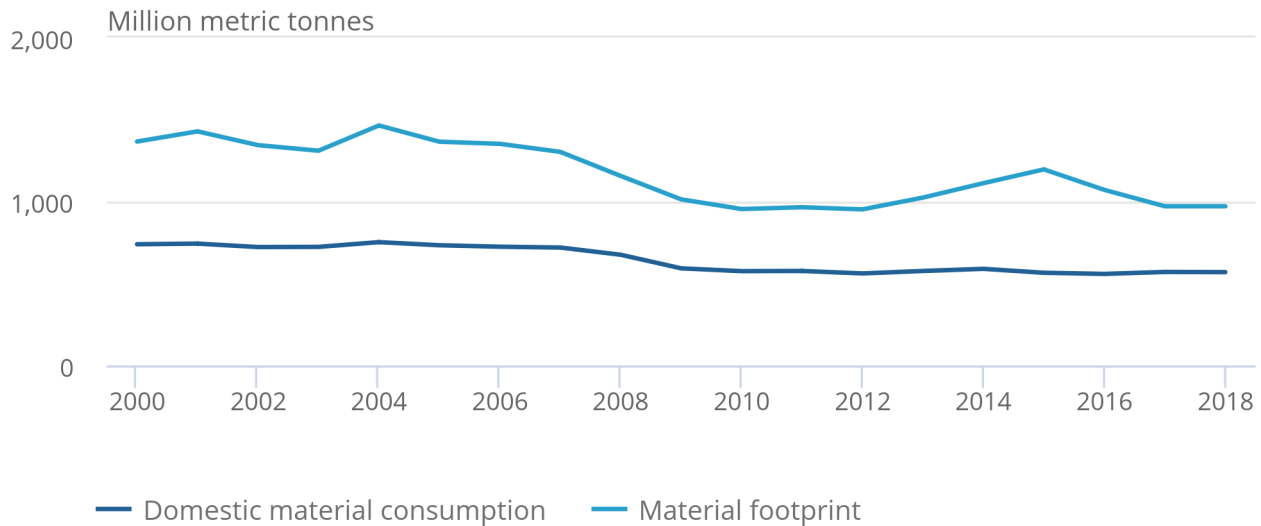
DMC shows the quantity of materials required for primary production processes. However, the material footprint shows the additional materials required to meet consumption demands; it captures the amount of domestic and foreign extraction of materials needed to produce the goods and services used by households, governments, and charities in the UK in one year. In countries where primary production is comparatively low, and demand for consumer goods and services is comparatively high, the material footprint can be noticeably higher than the DMC. This is the case for the UK, as can be seen on Figure 1.

## Figure 1: The UK's material footprint is consistently higher than its domestic material consumption

Material footprint and domestic material consumption, UK, 2000 to 2018

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Material footprint and domestic material consumption, UK, 2000 to 2018



Source: University of Leeds and Office for National Statistics

#### Notes:

1. Data for 1990 to 1999 for the footprint are available in the [dataset](#).
2. The data for DMC are used as one of the data sources for the footprint – because of timing of data availability, the DMC estimates used in the latest footprint are consistent with last year's publication. The DMC estimates shown in Figure 1 are the latest estimates. The differences between the two sets of DMC estimates are very small.
3. Estimates for DMC for 2019 are available in the [dataset](#).

## 3 . The material footprint by material group

Figure 2 shows the material footprint by type of material: biomass, metal ores, non-metallic minerals, and fossil fuels.

The UK's material footprint was estimated as 971 million tonnes in 2018, equivalent to 14.6 tonnes per person. The consumption of fossil fuels has been falling and was at 178 million tonnes in 2018. This is 68% below its peak in 1999, when it was 566 million tonnes.

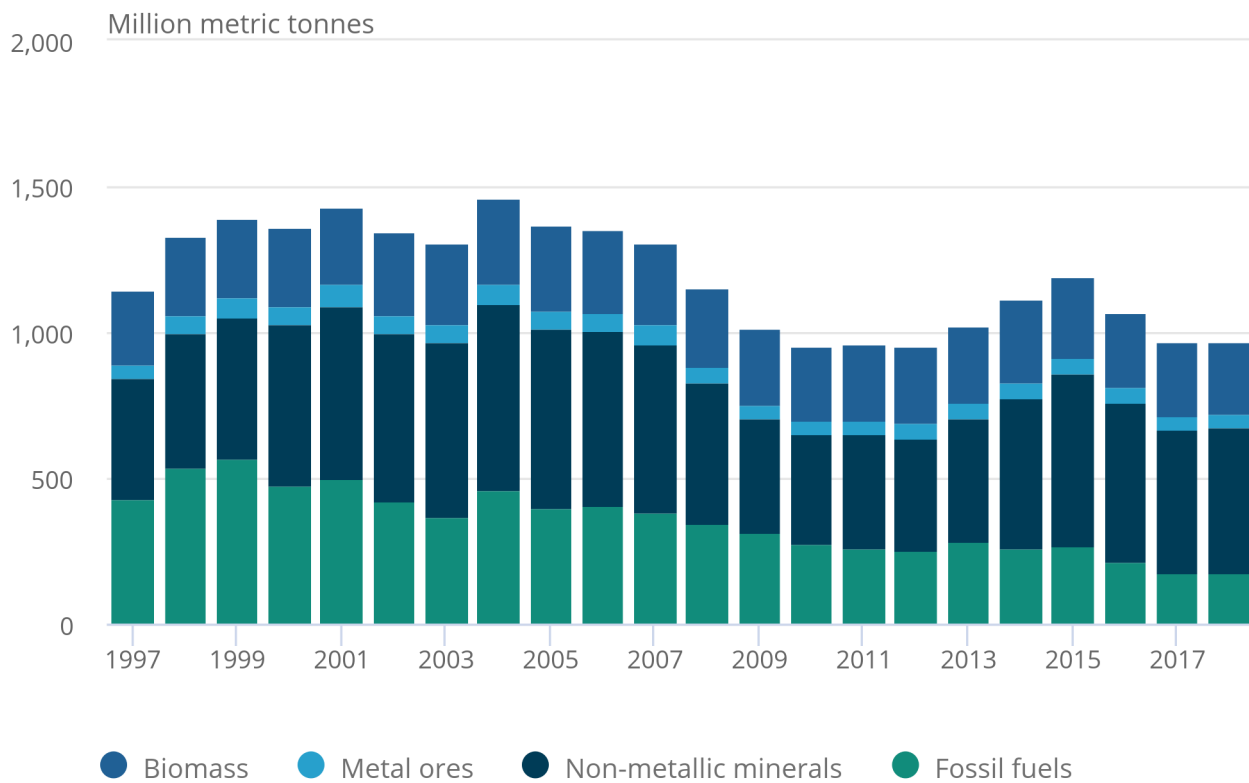
From 2000 onwards, non-metallic minerals, which are primarily used in construction, have been the biggest material type used.

## Figure 2: The proportion of the material footprint from fossil fuels is decreasing

Material footprint by the four constituent material groups, UK, 1997 to 2018

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Material footprint by the four constituent material groups, UK, 1997 to 2018



Source: University of Leeds

Notes:

1. Data for 1990 to 1996 are available in the [dataset](#).

## 4 . Country contributions to the UK footprint

Figure 3 shows the regions that contribute the most to the UK's footprint. Note that contributions to the aggregate footprint are not just a measure of imports; the contribution will depend on the specific materials imported for use in goods and services consumed by UK residents.

The UK's contribution to its own footprint, that is, domestic extraction, has fallen from 1997 to 2018 overall, an indication that the UK is increasingly reliant on imports to meet consumption demands. Since 2015, the UK's contribution has started increasing. In 2018, UK extraction accounted for 27% of the material footprint.

In addition to the UK, the United States and Russia have seen falls in their contribution to the UK's material footprint. The majority of Russia's contribution to the UK's footprint has been in fossil fuels. This was also true for the United States between 1997 and 2010. Since 2011, the United States has been contributing more non-metallic minerals than fossil fuels. Therefore, the overall downwards trends for these two countries could reflect their historic prominence in fossil fuel supply, as the UK is using fewer fossil fuel materials over time. For more details on type of material by country see the dataset accompanying this release.

For the other countries and regions included in the material footprint estimates, the majority are making a larger contribution to the UK footprint now than they were in 1997 (noting that trends can deviate in individual years). The largest contributors to the footprint in 2018 were China, India, and the European Union.

China's and India's contributions to the UK footprint began to grow noticeably from 1996, reaching their peak in 2015. In 2018, China and India accounted for 15% and 9% of the UK's material footprint respectively, compared with 5% and 1% in 1997.

The European Union's contribution has remained relatively stable over time. It accounted for 12% of the UK's material footprint in 2018, compared with 10% in 1997<sup>1</sup>.

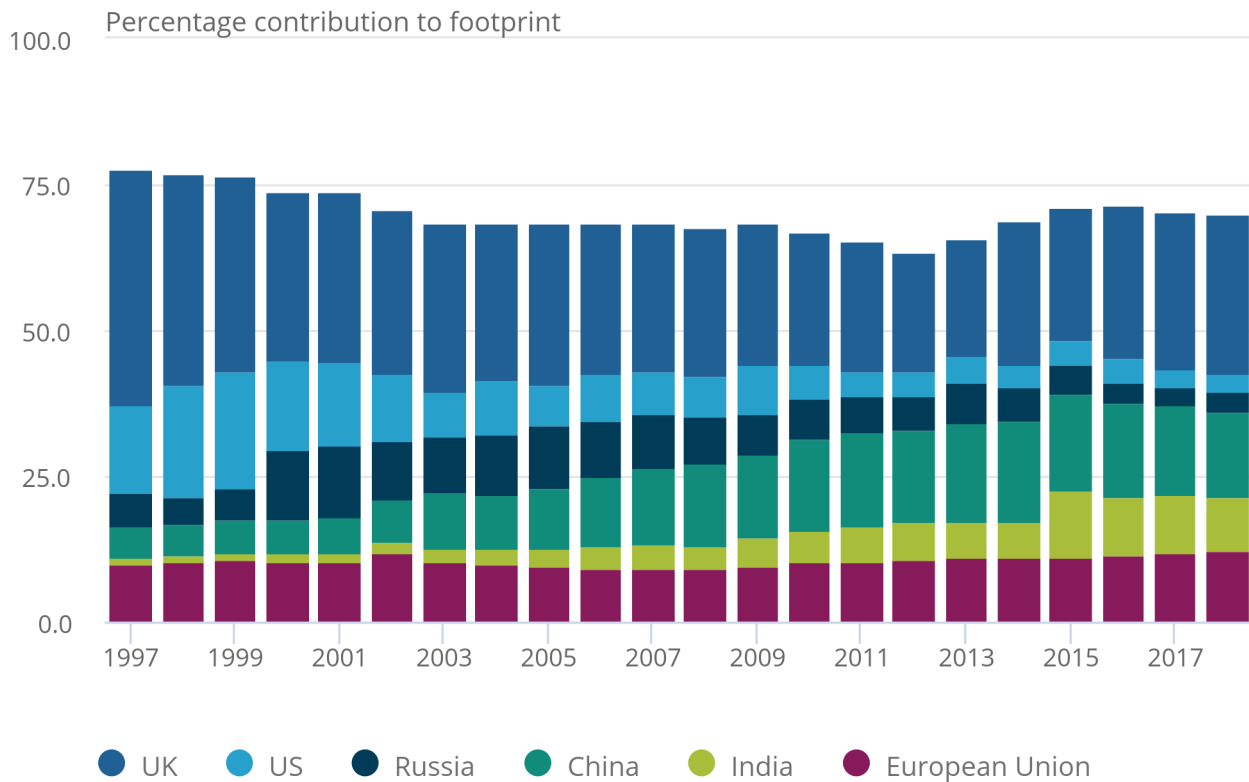
In more recent years other countries and regions have increased their contribution to the UK footprint, such as Rest of the Middle East and Brazil, although their contributions remain proportionally small. For more information see the dataset accompanying this release.

**Figure 3: The contribution to the UK's material footprint by different countries and regions is changing over time**

Contribution to the material footprint by the UK, the United States, Russia, China, India, and the European Union, UK, 1997 to 2018

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Contribution to the material footprint by the UK, the United States, Russia, China, India, and the European Union, UK, 1997 to 2018



Source: University of Leeds

Notes:

1. Data for more countries and regions, and by material group, and for the years 1990 to 1996, are available in the [dataset](#).
2. Contributions can change year-to-year because of absolute changes (a change in the quantity of material contributed) or relative changes (a change in another country's contribution will affect others where percentages are used, as they must sum to 100).

Notes for: Country contributions to the UK footprint

1. This refers to the [27 countries](#) of the European Union.

## 5 . Revisions

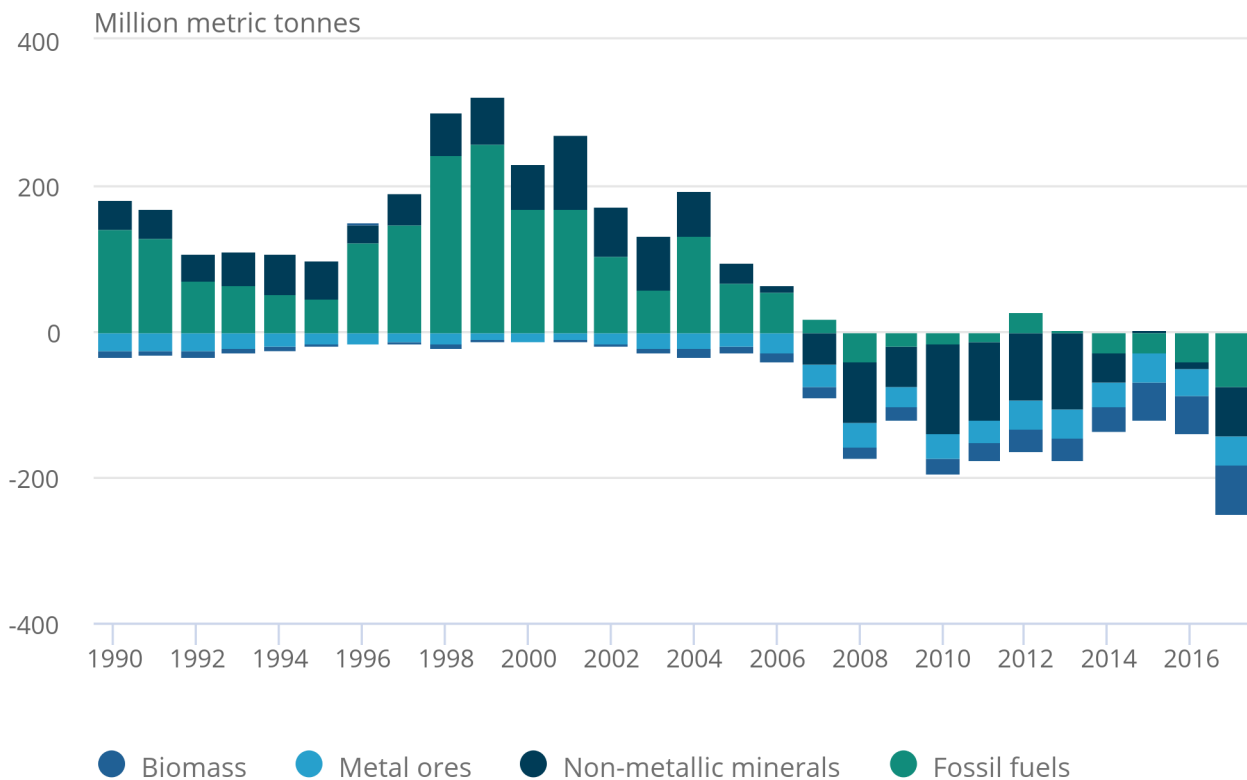
The source data for the latest estimates of the material footprint was more granular than for last year's estimates. The footprint uses [Supply and Use Tables](#) from the national accounts. For the latest estimates, it was possible to split out the mining of metal ore from the mining of crude petroleum and natural gas. This improved the allocation of metal ore and fossil fuels to different sectors. Figure 4 shows the size and direction of the revisions.

**Figure 4: There have been revisions to the footprint, especially for fossil fuels**

Revisions to the material footprint compared to last year's estimates, UK, 1990 to 2017

Figure 4: There have been revisions to the footprint, especially for fossil fuels

Revisions to the material footprint compared to last year's estimates, UK, 1990 to 2017



Source: University of Leeds

The fossil fuel footprint has been revised upwards for 1990 to 2007, by an average of 38%, and is revised down for 2008 to 2017 (with the exception of 2012), by an average of 8%. The metal ore footprint has been revised downwards for the whole time series, by an average of 31%.

Revisions also occur to the datasets because of changes in source data values, and several other instances of more granular sectoral splits.

## 6 . Material footprint data

### [Material footprint in the UK](#)

Dataset | Released 10 May 2021

The UK's material footprint captures the amount of domestic and foreign extraction of materials needed to produce the goods and services used by households, governments and charities in the UK, with data for 1990 to 2018.

### [Material flow accounts](#)

Dataset | Released 10 May 2021

Data on the UK's domestic extraction, imports and exports and flow of materials (biomass, minerals and fossil fuels), 1990 to 2019.

## 7 . Glossary

### Material footprint

Also known as raw material consumption, the material footprint captures the amount of domestic and foreign extraction of materials needed to produce the goods and services used by households, governments, and charities in the UK in one year. This information can be used to examine which goods and services have the largest impact on material extraction.

### Material flow accounts

These accounts show how materials flow through the economy, and have been updated to 2019. They show domestic extraction, imports and exports, and provide an indicator called domestic material consumption (extraction plus imports minus exports). The materials are grouped into biomass, metal ores, non-metallic minerals, and fossil fuels.

### Biomass

These materials include crops, wood and fish.

### Metal ores

These materials include iron and non-ferrous (those that do not contain iron) metals.

### Non-metallic minerals

These materials include a range of minerals, such as those used in the production of glass or cement. They may be referred to as construction materials.

### Fossil fuels

These materials include coal, oil and gas.



## 8 . Data sources and quality

Methodology for calculating material footprint is complex and the approach used can impact on the figures. This article gives the latest estimates using a method developed by the University of Leeds, updating the time series where revised data are available, and including figures for 2018. Data are presented for the UK<sup>1</sup>.

The material footprint estimates use, alongside other data sources, the material flow accounts (from the Office for National Statistics). It should be noted that, because of timing of data availability, the material footprint estimates are based on material flow estimates as previously published to 2018. Revisions to the material flow accounts are small. The main data source for the material footprint are [Supply and Use Tables](#) from the national accounts.

We previously published estimates of the UK's material footprint using the Eurostat approach, using a tool which is publicly available. The Eurostat method uses coefficients, which estimate the quantity of a raw material required for a given product in a given year. In the latest version of the tool, the coefficients were calculated for the EU27 (the UK was excluded). It has therefore not been possible to provide updated estimates for the UK material footprint using the Eurostat approach. More details on the method, and other available methods, can be found in the article [Measuring material footprint in the UK](#).

More information on the material flow accounts is in the [Quality and Methodology Information report](#).

### Notes for: Data sources and quality

1. Defra publish estimates of the material footprint for England as part of their report monitoring progress against the [Resources and Waste Strategy](#). The scaling methodology used to estimate this, while suitable for England, is more sensitive if applied to other UK countries. This is because the method uses household expenditure within the UK, of which England makes up a substantial proportion.

## 9 . Related links

### [Measuring material footprint in the UK: 2008 to 2016](#)

Article | Released 5 June 2019

The UK's material footprint captures domestic and foreign extraction of materials needed to produce products used in the UK. This article presents updated estimates and discusses the methodology.

### [Construction statistics, Great Britain: 2019](#)

Article | Released 21 January 2021

A wide range of statistics and analysis on the construction industry in Great Britain in 2019.

### [Resource efficiency metrics \(Defra and University of Leeds\)](#)

Methods document

To explore indicators of material resource efficiency, develop a carbon based metric to measure this and to consider future work to compare carbon intensity of materials and products over their lifetime.

### [Material footprint estimates for England \(Defra and University of Leeds\)](#)

This document aims to give an overview of the release of the Material Consumption-Based Accounts for England, showing a time series of results.

### [Carbon footprint estimates \(Defra and University of Leeds\)](#)

This publication investigates the impact that UK consumption has on carbon dioxide emissions. It is produced by the University of Leeds using the same methodology as the material footprint, for Defra.

