

Comparing environmental economy estimates, UK

A comparison of the methodology for the UK's two sets of environmental economy estimates. Including similarities and differences in coverage, how the estimates are calculated, and how to understand what the data show.

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1 . Main points

- The Office for National Statistics (ONS) currently produces two main sets of estimates providing insights into the UK's environmental economy.
- Estimates of the low carbon and renewable energy economy (LCREE) are obtained from a UK designed business survey and aim to reflect low carbon activity within the economy.
- The environmental goods and service sector (EGSS) estimates follow international guidance and include wider activity than "low carbon", such as recycling and the management of forest ecosystems.
- While these estimates have some similarities, they are not comparable; they have different uses linked to their different scopes and methods.

2 . Overview

The Office for National Statistics (ONS) currently publishes two main sets of estimates providing insights into the UK's environmental economy, which is an area of growing policy and public interest.

These are [the low carbon and renewable energy economy \(LCREE\) estimates](#) and the [environmental goods and services sector \(EGSS\) estimates](#). This article provides an overview of their quality and methodology, highlighting key similarities and differences.

The LCREE survey was developed to meet specific UK user needs for information on the low carbon and renewable energy economy. It provides estimates of the number of businesses, turnover, employment, imports, exports, acquisitions, and disposals.

The EGSS estimates follow international guidance, the UN [System of Environmental Economic Accounting \(SEEA\)](#), and provide estimates of output, gross value added, employment and exports.

While both sources provide employment and exports estimates, these are not directly comparable because they have different scopes (see [Section 3](#)).

LCREE is appropriate for understanding the low carbon and renewable energy economy and how this is distributed across different industries. It can therefore be used to highlight sectors of interest. EGSS offers insights into the environmental economy, providing estimates consistent with the National Accounts. It also allows international comparisons.

3 . A comparison of environmental economy estimates

Definitions and scope of the estimates

Activity in the [low carbon and renewable energy economy \(LCREE\)](#) is defined as "economic activities that deliver goods and services that are likely to help the UK generate lower emissions of greenhouse gases, predominantly carbon dioxide."

This excludes some activities that might be considered "green" but not low carbon, including recycling and the protection of biodiversity. Activities do not need to be carried out in a green way. For example, the manufacture of a low emission vehicle would be in the scope of the estimates even if the manufacturing process was not itself low carbon.

The [environmental goods and services sector \(EGSS\)](#) has a slightly wider definition, in that it is not restricted to low carbon activities. It is defined as "areas of the economy engaged in producing goods and services for environmental protection purposes, as well as those engaged in conserving and maintaining natural resources."

These areas of the economy must also produce the goods and services for primarily environmental reasons. EGSS excludes goods and services produced for purposes that, while beneficial to the environment, primarily satisfy technical, human and economic needs or that are requirements for health and safety. Goods and services related to minimising the impact of natural hazards and those related to the extraction, mobilisation and exploitation of natural resources are also excluded.

While both sets of estimates are available at a UK-wide level, only LCREE are currently available at country level within the UK.

Methods used to produce the estimates

The [low carbon and renewable energy economy \(LCREE\)](#) survey is a primary data source; a dedicated business survey run by the Office for National Statistics (ONS). This was designed specifically to capture activity in sectors identified as of interest for the survey and which met the definition of low carbon as agreed with stakeholders.

A sample of businesses from a wide range of industries is selected from the Inter-Departmental Business Register and asked about activity in the LCREE in the previous 12 months. This activity is captured regardless of the business' primary purpose. A full description of the method can be found in the [LCREE quality report](#).

[Environmental goods and services sector \(EGSS\)](#) estimates use existing data sources to provide an estimate of the environmental economy, using international statistical guidelines. A range of data sources are used, including the LCREE estimates. Other main sources include supply and use tables (SUT), the annual business survey (ABS), and the business register and employment survey (BRES). The [EGSS quality report](#) and [EGSS methodology annex](#) provide more details on the methods and data sources used.

Variables available

Both outputs provide estimates of employment, in full-time equivalent employees, and exports, although the different scope of the estimates means they are not directly comparable. The LCREE survey provides an estimate of turnover, while EGSS estimates output and gross value added. The LCREE also provides estimates of imports, acquisitions, disposals and number of businesses.

LCREE is published at UK country level and by LCREE sector. EGSS is published at UK level and by EGSS activity. Both sets of estimates are made available by [Standard Industrial Classification \(SIC\)](#) at Section level. For LCREE, this is limited to UK employment and turnover. For EGSS, this is available for all four variables. EGSS data are also provided by [Classifications of environmental protection activities \(CEPA\) and Resource management activities \(CReMA\)](#). These are internationally comparable classifications from a framework devised by Eurostat, which is [currently reviewing these classifications](#).

LCREE sectors and EGSS activities

While both estimates happen to cover 17 sectors or activities, these are different for each.

EGSS estimates cover 17 economic activities that the UK has identified in line with international guidance. These range from production of renewable energy to environmental university education to organic agriculture. A full list of the 17 activities can be found in [the EGSS quality report](#).

LCREE estimates cover 17 economic sectors that the UK has identified based on domestic factors. Examples of LCREE sectors are onshore and offshore wind, nuclear and energy efficient products. A full list of the 17 sectors can be found in [the LCREE quality report](#).

There are 10 EGSS activities that are not targeted in the LCREE-specific sectors. These are:

- environmental charities
- environment related education
- in-house environmental activities
- managerial activities of government bodies
- management of forests
- organic agriculture
- recycling
- waste
- wastewater
- water management

There are three LCREE sectors that are not covered by EGSS activities. These are:

- renewable combined heat and power
- alternative fuels (which includes hydrogen)
- nuclear power

Although the activities and sectors in these two lists are not explicitly covered in the respective estimates, it is possible that some economic activity in an EGSS activity could be captured in LCREE estimates and vice versa.

The LCREE survey samples businesses across a wide range of SICs. Therefore, depending on the SIC that LCREE respondent businesses are sampled from, there could be some overlap of economic activity. For example, SIC Division 02 is forestry and logging, which is part of Section A, which is agriculture, forestry and fishing. Data for SIC Groups 021 and 024 are used for the EGSS activity management of forest ecosystems, using the [annual business survey](#) and [business register and employment survey](#). While LCREE does not identify the management of forest ecosystems as a specific sector, a business included in the survey might be sampled from SIC 021. So, if this business reports activity in one or more LCREE sectors, for example bioenergy, then this activity will be allocated to Section A in the LCREE estimates by SIC.

Another EGSS activity is insulation activities. This is not measured using LCREE estimates, but there is a conceptual overlap between it and the LCREE sector called energy efficient products.

Use of LCREE in EGSS

Although it is often not a direct mapping, the LCREE survey is used as a primary data source for five EGSS sectors.

Energy saving and sustainable systems in EGSS maps directly to the LCREE sector energy monitoring, saving or control systems.

Environmental related construction uses data reported under a construction SIC (Section F, 41 to 43) within the LCREE sectors energy efficient lighting, energy efficient products and energy storage systems.

Environmental consultancy and engineering uses data from the LCREE sector low-carbon financial and advisory services, as well as LCREE data reported under specific SICs (69, 70, and 74.901, where these are not allocated to other EGSS activities).

The EGSS activity that covers environmental low emissions vehicles and carbon capture and storage uses data from LCREE sectors low-emission vehicles and infrastructure and carbon capture and storage. Inspection and control, the other component of this EGSS activity, uses data from other sources.

Production of industrial environmental equipment uses LCREE data reported under certain manufacturing SICs (26 to 30 and 33), in LCREE sectors energy efficient lighting, energy efficient products and fuel cells and energy storage systems.

Exploring renewable energy

Both the [LCREE estimates](#) and the [EGSS estimates](#) cover renewable energy in some way. However, the estimates are not directly comparable.

EGSS provides data for the activity production of renewable energy, which includes electricity, biofuels, and heat from renewable sources. It only covers the "exploitation phase", which is where the energy is produced. See the [EGSS methodology annex](#) and the [EGSS quality report](#) for more details.

LCREE provides data for low carbon electricity (offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, nuclear power, and carbon capture and storage), low carbon heat (renewable heat and renewable combined heat and power) and energy from waste and biomass (bioenergy and alternative fuels). Of these, nuclear power, renewable combined heat and power and alternative fuels are not covered in EGSS. Carbon capture and storage is part of a different EGSS activity.

Unlike EGSS, LCREE not only includes production of energy, but also "the design, production, and installation of infrastructure for this purpose, including operations and maintenance". See Table 2 in the [LCREE quality report](#).

4 . Users and uses of the estimates

Low carbon and renewable energy economy

The low carbon and renewable energy economy (LCREE) survey is the primary source of official information on LCREE activity. It has been specifically designed to meet the needs of the UK government and devolved administrations.

The survey provides an estimate of LCREE activity across the whole economy, as it samples businesses across the economy, no matter their primary purpose. Estimates are also made available by LCREE sector, such as offshore and onshore wind and low emission vehicles. This is of particular interest to users as data on these sectors are not available under current statistical classifications.

The survey has been designed to allow estimates of LCREE at country level, asking respondents to provide a percentage split of their LCREE activity between UK regions. This helps address the problem of many businesses having their reporting office in a different location to where the LCREE activity takes place and removes potential "head office" effects.

Estimates from the survey are currently used by the UK, devolved governments, and the wider research community, as well as by international organisations. They can be used to help assess and develop policies in areas such as job creation, investment in the LCREE economy or the trade of LCREE products.

Results from the survey have been cited in various policies and reports. These include the [Ten Point Plan for a Green Industrial Revolution](#) and the [Net Zero Strategy](#). A [report on local green jobs](#) commissioned by the Local Government Association also uses LCREE. However, as LCREE focuses on low carbon and renewable energy, it is often used with other measures for wider estimates of "green jobs" or the "green economy".

Environmental goods and services sector

A key benefit of the environmental goods and services sector (EGSS) data are its compatibility with definitions used within the UN System of National Accounts (SNA), aiding economic analysis and international comparability. A number of [European countries use EGSS](#), but sources and methodology do vary while following a similar framework.

The framework also allows for the alignment of different accounts. For example, our [environmental protection expenditure estimates](#) have some overlaps with the EGSS estimates. The framework is designed to use National Accounts data, so that the accounts can be used alongside wider economic statistics. This helps contextualise the data and widen the options for analysis.

The wider scope of EGSS means it can also be used to consider a broader definition of the UK's environmental economy than LCREE alone. For example, we have used EGSS estimates to explore the potential development of [a measure of "nature jobs"](#) within the UK.

EGSS estimates have been used in papers on green jobs, including [The role of innovation and agglomeration for employment growth in the environmental sector](#), for the German Economic Association, and [Going Green: Preparing the UK workforce for the transition to a net-zero economy](#), from Nesta.

Estimates of LCREE are used in the compilation of EGSS, in five EGSS activities. This is explored more in [Section 3](#).

5 . Quality characteristics

Limitations of the estimates

There is an increasing demand for information on the low carbon and renewable energy economy (LCREE), some of which the survey currently is not able to provide. One area of demand is for more detailed regional estimates. We are planning to publish an [experimental article](#) on regional estimates of turnover and employment in the LCREE later this year. Another is for further information on variables, such as characteristics of employment.

It can also be difficult to make robust comparisons over time, because of the levels of uncertainty associated with these survey-based estimates. This is because activity in the LCREE is spread across a wide range of industries. Many sectors are small but growing, and for many businesses LCREE activity is secondary rather than primary. Should the LCREE continue to increase in size, it will become easier to robustly monitor changes over time.

EGSS estimates are presently only available at UK level and are published three years after the reference period. The methods for some activities are more robust than others. The use of multiple data sources also makes communicating the quality of the estimates to users challenging. This is both for overall estimates and specific activities.

Accuracy and reliability

Measures of [uncertainty](#) are published alongside the LCREE estimates, including confidence intervals and coefficients of variation (CVs). In general, UK total estimates of LCREE tend to have a CV of 5% or less.

When new data are published, revisions for the previous two years are provided. This incorporates any additional survey data that has been received, as well as any changes because of new data given by survey respondents. Revisions for the variables turnover and employment tend to be less than 5%. Revisions to other variables can sometimes be greater because there is less LCREE activity associated with these variables, so they are more susceptible to changes in the raw data.

The EGSS uses a number of data sources, many of which are adjusted or provide the basis of models. Because of this, it is not possible to produce statistical measures of accuracy, such as variances and confidence intervals. The accuracy of the estimates varies depending on the data source and method used. Details of the data sources and methods used to construct EGSS are published in [our EGSS methodology annex](#).

Quality assurance processes are completed to ensure accurate and consistent production of both the LCREE and EGSS estimates. These processes include manual and built-in automated checks. For example, automated checks examine subtotal to total consistency, year-on-year differences in estimates, and the ratio of economic variables to each other.

Timeliness and punctuality

LCREE estimates are provided roughly one year after the latest reference year. For example, estimates for 2020 were published in February 2022.

EGSS estimates are provided three years after the reference period. For example, estimates for 2019 were published in March 2022.

Both EGSS and LCREE, and any associated articles, are [pre-announced on the Office for National Statistics \(ONS\) website](#). Previously released datasets are also available on the website.

Other information on quality associated with the EGSS and LCREE estimates can be found in their respective quality reports, links to which can be found in [Section 6](#).

6 . Related links

[Low Carbon and Renewable Energy Economy Survey quality and methodology information](#)

Methodology | Revised 17 February 2022

Quality and methodology information for the Low Carbon and Renewable Energy Economy (LCREE) Survey, detailing the strengths and limitations of the data, methods used and data uses and users.

[Environmental accounts on the environmental goods and services sector quality and methodology information](#)

Methodology | Revised 3 June 2021

Quality and methodology information for environmental goods and services sector statistics, detailing the strengths and limitations of the data, methods used and data uses and users.

[Environmental goods and services sector methodology annex](#)

Methodology | Revised 3 June 2021

Detailed description of each environmental goods services sector (EGSS) activity, with information on the main data sources and estimation methods used.

[UK environmental goods and services sector estimates: 2019](#)

Bulletin | Released 21 March 2022

First estimates of the UK environmental goods and services sector (EGSS) for 2019 and revised estimates for 2010 to 2018. Included are estimates of output, gross value added, employment and exports.

[Low carbon and renewable energy economy, UK: 2020](#)

Bulletin | Released 17 February 2022

Estimates of the size of the UK's green economy from the Low Carbon and Renewable Energy Economy Survey, including turnover and employment.