Office for National Statistics

Statistical bulletin

Low carbon and renewable energy economy, UK: 2023

Estimates of the size of the UK's low carbon and renewable energy economy, including turnover and employment.

Contact:
Environmental Surveys team
environment.accounts@ons.gov.uk

Release date:
9 July 2025

Next release:
To be announced

Notice

9 July 2025

This bulletin contains statistics and analysis that were previously published in our Low Carbon and Renewable Energy Economy (LCREE) Survey indirect estimates, UK bulletin series. Indirect estimates data are still published separately in our Low carbon and renewable energy economy indirect estimates dataset.

Table of contents

1 . Main points

- UK low carbon and renewable energy economy (LCREE) employment was estimated to be 314,300 full-time equivalent (FTEs) in 2023; UK LCREE turnover (in current prices) was estimated to be £67.5 billion.
- Electricity, gas, steam and air conditioning supply had the highest turnover among LCREE industries at £20.2 billion (30.0% of the total) in 2023, while construction had the largest employment at 118,500 FTEs (37.7% of the total).
- The broader low carbon electricity group within LCREE had the highest turnover in 2023, at £25.8 billion (38.2% of the total), while the energy efficient products group had the highest employment level, at 145,900 FTEs (46.4% of the total).
- Provisional 2023 UK indirect LCREE turnover was an estimated £29.2 billion, with an estimated 153,600 FTEs.

LCREE estimates are survey based and use a sample of businesses rather than the whole population, so are subject to measurable sampling uncertainty. This should be considered when looking at changes in the estimates over time. For more information, see Uncertainty and how we measure it for our surveys methodology.

2 . The UK’s low carbon and renewable energy economy, 2023

This bulletin outlines low carbon and renewable energy economy (LCREE) turnover and employment trends. Our accompanying datasets also give trade, acquisitions, and disposals statistics.

UK business activity is considered part of the LCREE if they report activity in one or more of 17 defined sectors. Many of these sectors are small, and LCREE is a secondary activity for many businesses. Given the uncertainty in estimates for individual LCREE sectors, data presented in this bulletin combine similar sectors into larger groups. For more information, see Section 6: Glossary

We collect these data from businesses annually. All financial estimates in this bulletin are given in current prices as provided by the survey respondents; no inflation adjustments have been made.

Low carbon and renewable energy economy in the UK and by country

LCREE employment was estimated at 314,300 full-time equivalent (FTE) employees in 2023, a 32,400 FTE (11.5%) increase since 2022. LCREE turnover was estimated at £67.5 billion, a £0.1 billion (0.1%) decrease since 2022 (Table 1).

The number of businesses reporting LCREE activity has decreased by 4.0%, from 101,000 in 2022 to 97,000 in 2023.

Table 1: UK low carbon and renewable energy economy turnover was £67.5 billion, with 314,300 FTE employees in 2023
LCREE turnover and full-time equivalent (FTE) employment estimates (with confidence intervals), UK and constituent countries, 2023

	Turnover (£ billions)			Employment (FTE)		
	Estimate	Lower CI	Upper CI	Estimate	Lower CI	Upper CI
UK	67.5	64.2	70.8	314,300	289,900	338,800
England	51.2	48.3	54.1	257,900	235,000	280,700
Scotland	11.6	10.6	12.6	33,500	28,700	38,400
Wales	3.3	2.9	3.7	15,600	13,400	17,800
Northern Ireland	1.4	1.2	1.6	7,300	6,100	8,500

Source: Low Carbon and Renewable Energy Economy Survey from the Office for National Statistics

Notes

1. Figures may not sum because of rounding.
2. Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of a survey-based estimate. More information can be found in Section 6: Glossary.

Low carbon and renewable energy economy groups

We combine sectors with similar activity into six larger groups. More information can be found in Section 6: Glossary.

The low carbon electricity group had the highest turnover in 2023 at £25.8 billion (38.2% of total LCREE turnover). However, this group saw an estimated 3.7% decrease since 2022 (£1.0 billion). The low carbon services group saw the largest increase in turnover since 2022 of 61.3% (£0.8 billion), whilst the low carbon heat group saw the largest decrease in turnover of 8.8% (£0.3 billion).

Figure 1: The low carbon electricity group had a LCREE turnover of £25.8 billion, the highest in 2023

LCREE group turnover, UK, 2022 and 2023, £ billions

Notes:

1. Full definitions of each LCREE group can be found in Section 6 of our quality and methodology information report.

2. Given the uncertainty of the estimates, rankings of the smaller groups are indicative only.

3. Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of a survey-based estimate. More information can be found in Section 6: Glossary.

4. Some abbreviations are used in this table, “LCL” refers to “lower confidence limit”; “UCL” refers to “upper confidence limit”.

Downloac

The energy efficient products group had the largest LCREE employment in 2023, with 145,900 FTEs (46.4% of total LCREE employment). Meanwhile, the low carbon heat group saw the largest increase in FTE employment, rising from 18,400 in 2022 to 24,800 FTEs in 2023, a 34.8% increase.

Figure 2: The energy efficient products group had the largest LCREE employment level in 2023, at 145,900 FTEs

LCREE group employment, UK, 2022 and 2023, full-time equivalents (FTEs), in thousands

Notes:

1. Full definitions of each LCREE group can be found in Section 6 of our quality and methodology information report.

2. Given the uncertainty of the estimates, rankings of the smaller groups are indicative only.

3. Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of a survey-based estimate. More information can be found in Section 6: Glossary.

4. Some abbreviations are used in this table, “LCL” refers to “lower confidence limit”; “UCL” refers to “upper confidence limit”.

Downloac

Low carbon and renewable energy economy industries

These sector and group breakdowns are unique to this survey and help draw out specific activities. UK businesses can also be classified by industry using the Standard Industrial Classification 2007 (SIC).

Using the SIC breakdown, electricity, gas, air and steam supply industry has remained the highest turnover in 2023 at £20.2 billion (30.0% of total LCREE turnover). This is the second consecutive year that electricity, gas, steam, and air conditioning supply has been the leading industry (based on SIC) contributor to turnover in the LCREE (Figure 3).

Figure 3: The electricity, gas, steam and air conditioning supply industry had a LCREE turnover of £20.2 billion, the largest in 2023

LCREE industry turnover, UK, 2022 and 2023, £ billions

Notes:

1. The three industries with the highest 2023 employment are shown. All fourteen industries are available in our accompanying dataset

2. Given the uncertainty of the estimates, rankings of the smaller industries are indicative only.

3. Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of a survey-based estimate. More information can be found in Section 6: Glossary.

4. Some abbreviations are used in this table, “LCL” refers to “lower confidence limit”; “UCL” refers to “upper confidence limit”.

Downloac

The construction industry (SIC) had the largest employment in 2023, with 118,500 FTEs (37.7% of total LCREE employment). This marks the fourth consecutive increase for this industry since 2020 (Figure 4).

Figure 4: The construction industry had the largest LCREE employment level in 2023, at 118,500 FTEs

LCREE industry employment, UK, 2022 and 2023, full-time equivalents (FTEs), in thousands

Notes:

1. The three industries with the highest 2023 employment are shown. All fourteen industries are available in our accompanying dataset

2. Given the uncertainty of the estimates, rankings of the smaller industries are indicative only.

3. Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of a survey-based estimate. More information can be found in Section 6: Glossary.

4. Some abbreviations are used in this table, “LCL” refers to “lower confidence limit”; “UCL” refers to “upper confidence limit”.

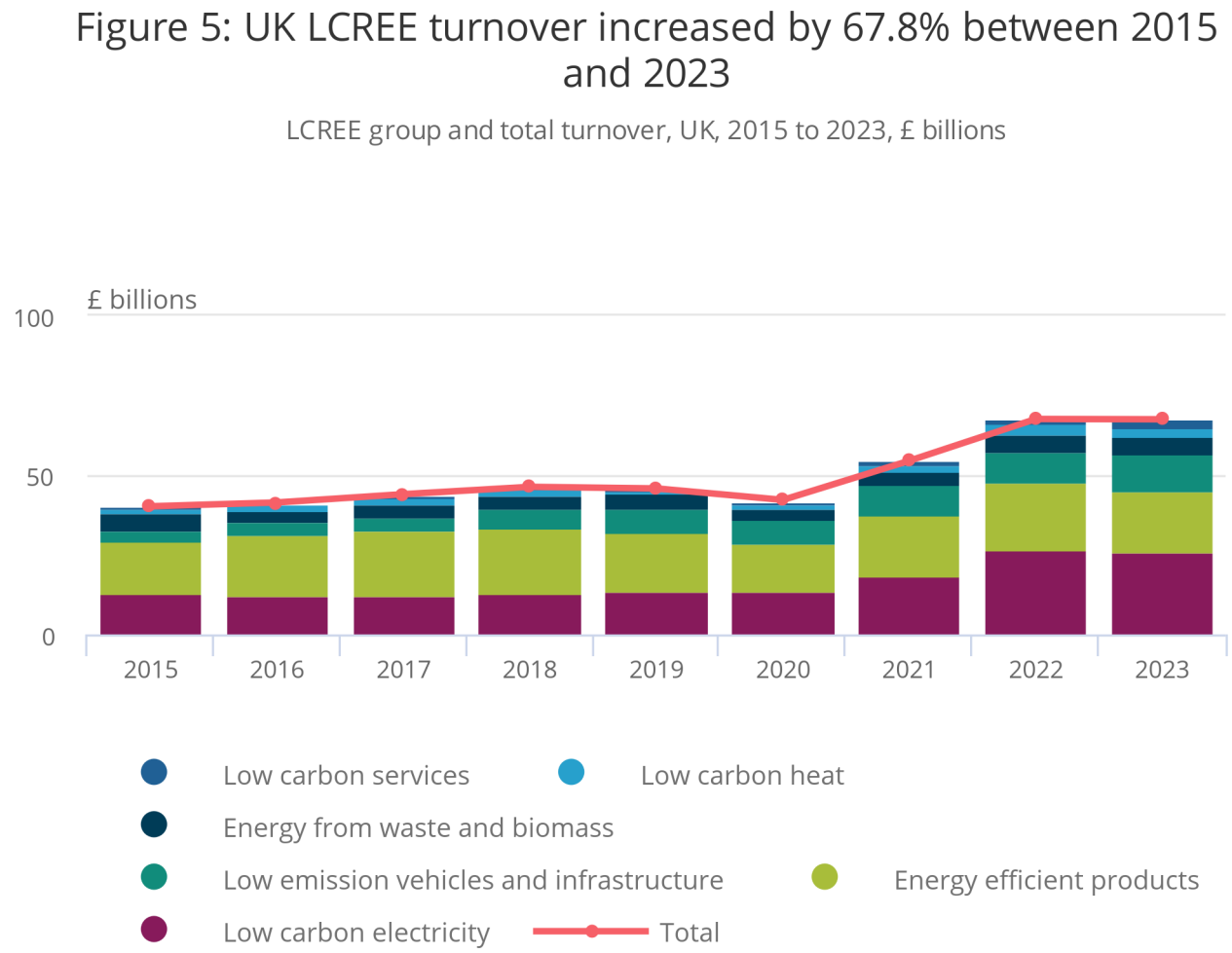
Downloac

3 . Trends in LCREE group turnover and employment

Employment in the low carbon and renewable energy economy (LCREE) is estimated to have increased between 2022 and 2023, reaching its highest level since the introduction of comparable data in 2015. Over the same period, LCREE turnover remained broadly stable (Figure 5).

Figure 5: UK LCREE turnover increased by 67.8% between 2015 and 2023

LCREE group and total turnover, UK, 2015 to 2023, £ billions



Source: Low Carbon and Renewable Energy Economy (LCREE) Survey from the Office for National Statistics billions

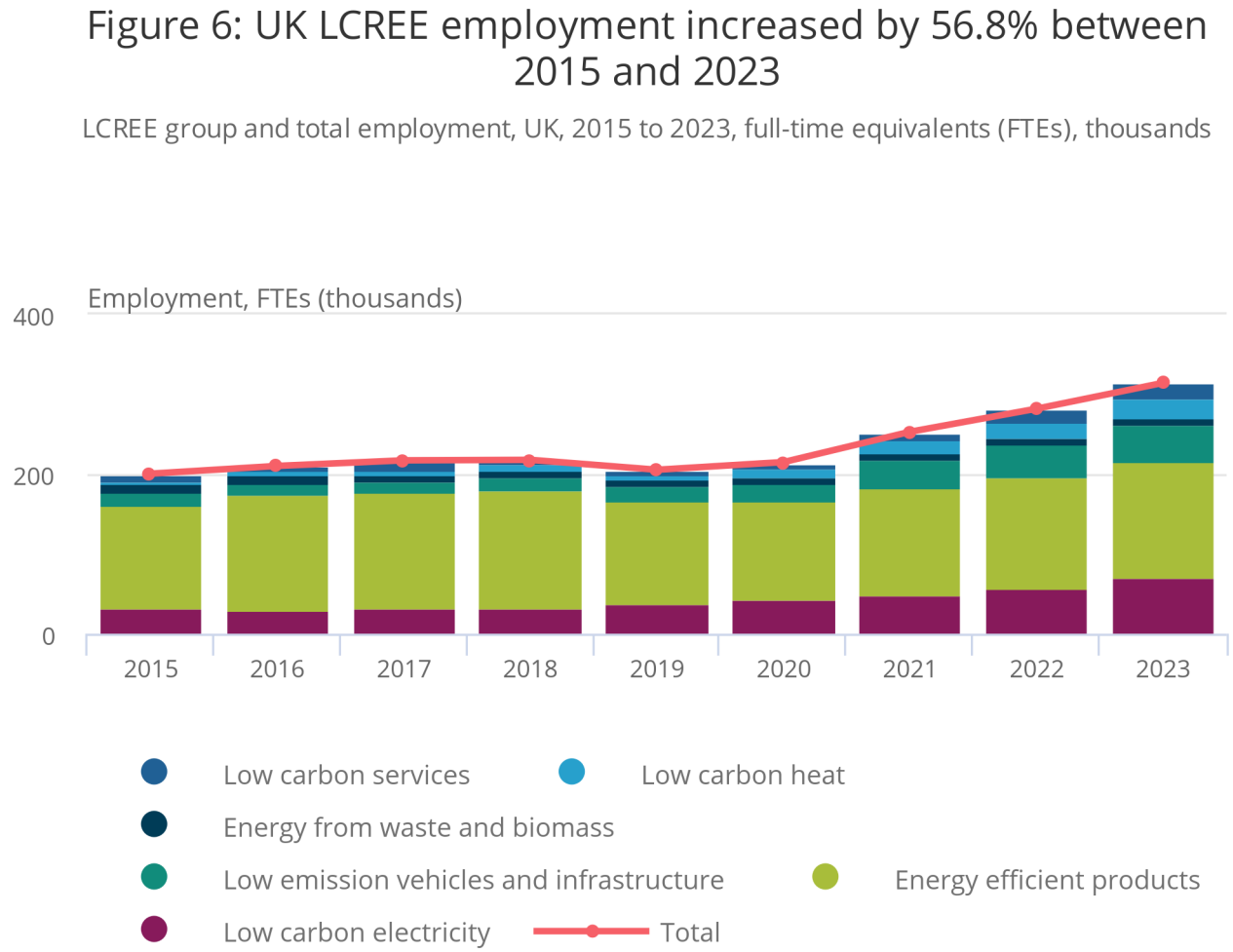
Notes:

1. Full definitions of each LCREE group can be found in Section 6 of our quality and methodology information report.
2. Confidence intervals can be found in our accompanying dataset.
3. Given the uncertainty of the estimates, rankings of the smaller groups are indicative only.
4. Please be aware that rounding may result in minor turnover percentage discrepancies.

LCREE employment is estimated to have increased by 56.8% since the first comparable figures were published in 2015 (Figure 6).

Figure 6: UK LCREE employment increased by 56.8% between 2015 and 2023

LCREE group and total employment, UK, 2015 to 2023, full-time equivalents (FTEs), thousands



Source: Low Carbon and Renewable Energy Economy (LCREE) Survey from the Office for National Statistics

Notes:

1. Full definitions of each LCREE group can be found in Section 6 of our quality and methodology information report.

2. Confidence intervals can be found in our accompanying dataset.

3. Given the uncertainty of the estimates, rankings of the smaller groups are indicative only.

4 . Indirect Low Carbon and Renewable Energy Economy estimates, UK 2015 to 2023

Indirect estimates provide an indication of the effect that direct economic activity has on the wider economy. This release updates both indirect and total (direct and indirect) estimates of turnover and employment in the low carbon and renewable energy economy (LCREE) between 2015 and 2023.

Indirect estimates for 2023 are provisional. Indirect estimates for all years are official statistics in development.

Indirect LCREE turnover was an estimated £29.2 billion in 2023, and indirect employment an estimated 153,600 full-time equivalent (FTEs) employees. The low carbon electricity group had the highest indirect turnover (£10.9 billion) in 2023; the energy efficient products group the largest indirect employment (53,700 FTEs).

Between 2015 and 2023, UK indirect turnover increased by an estimated 86.6% (from £15.7 billion to £29.2 billion), while employment increased by an estimated 44.1% (from 106,600 to 153,600 FTEs).

5 . Low carbon and renewable energy economy data

Low carbon and renewable energy economy estimates
Dataset | Released 9 July 2025
This release includes annual estimates of low carbon and renewable energy economy activity in the UK and constituent countries: turnover, employment, exports, imports, acquisitions, disposals, and number of businesses.

Low carbon and renewable energy economy indirect estimates
Dataset | Released 9 July 2025
Annual estimates of Low Carbon and Renewable Energy Economy (LCREE) direct, indirect, and total turnover and employment in the UK, by sector and group.These are official statistics in development.

6 . Glossary

Confidence Intervals

Confidence intervals (CIs) are a standard way of expressing the statistical accuracy of survey-based estimates. A 95% confidence interval is the range within which the true population value would fall for 95% of the time, if the survey was repeated. If an estimate has a high error level, the corresponding confidence interval will be very large.

Employment

Employment is measured in terms of full-time equivalent (FTE) employees, where one FTE employee may be thought of as one person working full-time for one year.

Industry

Businesses are classified into an industry using the current Standard Industrial Classification 2007 by the type of economic activity in which they are engaged. The Low Carbon and Renewable Energy Economy (LCREE) Survey samples UK businesses in these 14 industries, but not all sub-groups within these industries are sampled:

- A - agriculture, forestry and fishing
- B - mining and quarrying
- C - manufacturing
- D - electricity, gas, steam and air conditioning supply
- E - water supply; sewerage, waste management and remediation activities
- F - construction
- G - wholesale and retail trade; repair of motor vehicles and motorcycles
- H - transportation and storage
- J - information and communication
- L - real estate activities
- M - professional, scientific and technical activities
- N - administrative and support service activities
- P - education
- S - other activities

Low carbon and renewable energy economy

Economic activities that deliver goods and services that are likely to help the UK generate lower emissions of greenhouse gases.

Low carbon and renewable energy sectors

The LCREE Survey asks UK businesses to self-classify themselves into 17 low carbon and renewable energy sectors:

1. Offshore wind
2. Onshore wind
3. Solar
4. Hydropower
5. Other renewable electricity
6. Bioenergy
7. Alternative fuels
8. Renewable heat
9. Renewable combined heat and power
10. Energy efficient lighting
11. Energy efficient products
12. Energy monitoring, saving or control systems
13. Low carbon consultancy, advisory and offsetting services
14. Low emission vehicles and infrastructure
15. Carbon capture and storage
16. Nuclear power
17. Fuel cells and energy storage systems

A business can be active in more than one sector.

Low carbon and renewable energy groups

The LCREE sectors can be combined into groups of activities that are considered similar.

Low carbon electricity group

Offshore wind, onshore wind, solar, hydropower, other renewable electricity, carbon capture and storage and nuclear power.

Low carbon heat group

Renewable heat, and renewable combined heat and power.

Energy from waste and biomass group

Bioenergy, and alternative fuels.

Energy efficient products group

Energy efficient lighting, energy efficient products and energy monitoring, saving or control systems.

Low carbon services group

Low carbon consultancy, advisory and offsetting services.

Low emission vehicles group

Low emission vehicles and infrastructure, and fuel cells and energy storage systems.

Turnover

The amount received in sales from goods and services in a defined time period. It is a useful measure of the health of a business or an economy.

7 . Data sources and quality

Data sources and collection

The survey collects information on turnover, imports, exports, employment, and acquisitions and disposals of capital assets, for 17 low carbon and renewable energy economy (LCREE) sectors. For more information, see the Low carbon sector codes and descriptions (.doc, 26.1 KB). Data are collected from businesses annually.

Coverage

Only the portion of a business' economic activity that directly relates to activity in a defined LCREE sector in the UK is included in the direct estimates.

Revisions

This release contains revisions to estimates for the years 2021 to 2022. Revisions can result from a variety of factors, including:

- businesses adding data for previous years
- businesses revising their previous submissions
- developments in methodology

Quality

More information on strengths, limitations, appropriate uses, and how the data were created is available in our LCREE Survey quality and methodology information (QMI)

Indirect estimates

This release uses our updated methodology to produce LCREE indirect estimates. This new method uses our UK input-output analytical tables: industry by industry datasetin its calculations. More quality and methodology information on appropriate uses, and how the data were created is available in ourLCREE Survey: indirect estimates methodology.

The methodology used to generate UK input-output tables (IOTs) is constantly under review. A major piece of development work was undertaken in 2017 to generate industry-by-industry IOTs for the first time. Indirect and total estimates for 2015 and 2016 are calculated using the 2017 IOTs because of a lack of data for these two years. The latest available UK IOTs were published for 2022. Estimates for 2023 are therefore provisional and are calculated using the 2022 IOT. These provisional estimates will be updated once IOTs are available for the corresponding year of LCREE data.

These statistics are labelled as "official statistics in development". Until September 2023, these were called "experimental statistics". Read more about the change in ourGuide to official statistics in development.

Strengths

The LCREE Survey has a high response rate and directly collects information on LCREE activity by sector.

Limitations

Activity in the LCREE is spread across a wide range of industries. While many sectors have grown, they remain small, and for many businesses LCREE activity is secondary rather than primary. Therefore, estimates are subject to volatility.

More information on strengths and limitations can be found in Section 4 of our LCREE Survey Quality and Methodology Information (QMI).

We are aware of a limitation in the method resulting in a bias towards overestimation of the total (direct plus indirect) LCREE estimates. This is because LCREE survey data are currently being used to represent direct effect. This is not completely accurate because the survey data contains some intermediate demand. This results in double counting when combining with indirect effects to calculate total effects.

There is an additional limitation to this method when providing indirect LCREE turnover. It is not currently possible to separate turnover collected from sales out from other activity contributing to economic output.

Uncertainty

Full LCREE estimates presented in this bulletin are survey based and gather information from a sample rather than the whole population. This means that they are subject to measurable sampling uncertainty, which affects how changes in the estimates across periods should be interpreted.

Estimates of the level of uncertainty associated with all figures (confidence intervals and coefficients of variation) are presented in the datasets to support interpretation. These uncertainty measures account for both the variability in the estimate of the proportion of businesses active in the LCREE, and the variability of the estimate of those businesses.

The variability in the estimate of the proportion of businesses active in the LCREE can be particularly variable because of sampling. This can be seen in the fluctuation in the estimates of the number of businesses in our accompanying dataset, and their higher level of uncertainty.

More information can be found in our Uncertainty and how we measure it for our surveys methodology.

Sample size

The LCREE Survey was undertaken for the tenth time in 2024, for the reporting year 2023, using a sample of around 25,000 businesses. The response rate was 73.7% in 2023, with more than 3,500 businesses returning data in at least one LCREE sector. More information can be found in our LCREE Survey QMI.

The 2023 response rate was higher than the 2019, 2020 and 2021, which were all below 70%. A lower response rate leads to more uncertainty, as there are fewer responses on which to base the survey results.

The lower response rates in 2019 to 2021 was likely because of the coronavirus (COVID-19) pandemic and related restrictions (2019 data were collected in 2020). The response rate before the pandemic was above 80%.

8 . Related links

Low Carbon and Renewable Energy Economy Survey indirect estimates, UK: 2015 to 2022
Bulletin | Released 25 November 2024
Indirect and total estimates of turnover and employment in the low carbon and renewable energy economy. These are official statistics in development.

Low Carbon and Renewable Energy Economy (LCREE) Survey QMI
Methodology | Released 9 July 2025
Quality and Methodology Information for the Low Carbon and Renewable Energy Economy (LCREE) Survey, detailing methods used, data it provides, and strengths and limitations.

Experimental estimates of green jobs, UK: 2024
Bulletin | Released 14 March 2024
Exploring estimates of green jobs using the industry, occupation and firm approaches. The next update for our green jobs statistics, using this latest set of LCREE survey results, will be published on 18th July 2025.

Environmental goods and services sector (EGSS) estimates
Dataset | Released 5 June 2025
First estimates of the UK environmental goods and services sector (EGSS) for 2022 and revised estimates for 2010 to 2021. Included are estimates of output, gross value added, employment and exports.

UK inputoutput analytical tables: industry by industry
Dataset | Released 20 February 2025
Industry by industry and further analysis tables derived from the annual Supply and Use Tables (SUTs) for 2022.

Employment multipliers and effects in the UK
Dataset | Released 31 March 2025
Estimates of full-time equivalent (FTE) employment per £m, type 1 FTE employment effects, and type 1 FTE employment multipliers across 105 industries. These are official statistics in development.

9 . Cite this statistical bulletin

Office for National Statistics (ONS), released 9 July 2025, ONS website, statistical bulletin, Low carbon and renewable energy economy, UK: 2023

Low Carbon and Renewable Energy Economy (LCREE) Survey estimates,

Contents